

Tender advertisement No: DAVV/ITC/Central/1/2011 **Dated:** Dec 28, 2011

Price of Tender Form ; Non-refundable Rs. 1000/- (DD in separate sealed envelope)

Last date of Submission: Jan 25, 2012 at 4 pm

The satisfactory delivery of goods must be ensured by 13 March, 2012.

Devi Ahilya Vishwavidyalaya, Indore

Tender Document

Dec, 2011



Devi Ahilya Vishwavidyalaya

Khandwa Road Campus, Indore (M.P.) 452 001

Phone No.: 07312761358, 07312470027; 07312438531;

Website : www.dauniv.ac.in

Devi Ahilya Vishwavidyalaya

Khandwa Road Campus, Indore (M.P.) 452 001

Phone No.: 07312761358,07312470027 Fax: 07312761358

Website : [www. dauniv.ac.in](http://www.dauniv.ac.in)

To,

Ref: Tender Enquiry No: **DAVV/ITC/Central/1/2011**

Dated: Dec 28, 2011

TERMS AND CONDITIONS ARE GIVEN IN APPENDIX A1

Item Category	Item Description
Item Set 1/ School of Computer Science & IT	<p>(1) Networking of 48/96 points in Academic wing with Switches, I/O ,Cabling Site Plan and Connectivity from server room etc with [01 no.]</p> <ul style="list-style-type: none">1)Switches- CISCO 10/100/1000 24Port Switches2)I/O – Dlink I/O3) Cable-Dlink CAT6 cable with patch panel and Patch cards. <p>Remarks: Includes Installation & testing of Points On Turn Key Basis</p> <p>(2) Language Laboratory: Department has already adapted CLARITY platform</p> <p>Now over this platform, three more software named are required a follows:</p> <ul style="list-style-type: none">1. Clarity Clear Pronunciation2. Clarity Business Writing3. Clarity Active Reading4. Clarity tense buster5. Clarity Advanced grammar6. practice test for TOEFL, IELTS, TOEIC, IBT <p>(20 user perpetually valid licenses for all the above products)</p>
Item Set 2/ School of Chemical Sciences	<p>(1) Fourier Transform Infra-Red Spectrophotometer (FTIR) (PC based)</p> <p>Standard Wavelength range 7800~350 cm-1, upgradeable to Far Infra-Red and Near Infra-Red ranges)</p> <ul style="list-style-type: none">• Wavelength Range : 7800 ~350 cm-1 (standard range)• FTIR Range should be upgradeable to NIR (12500 cm-1) or FIR up to (240cm-1) with user replaceable and automatically aligned beam splitter.• FTIR Spectrophotometers with Signal-to-Noise ratio of 40,000: 1 or better (Peak to peak, at 4cm resolution, 1 minute accumulation, around 2100cm-1)• High spectral resolution should be 0.5 cm-1 or better.• Wave number accuracy: better than 0.01 cm-1.• Warm up time of FTIR should be mention clearly by supplier.• Detector should be DLATGS (Deuterated triglycine sulphate dopped with L-alanine) with temperature control for Middle /Far IR

- Optics should be gold plated for high energy throughput
- Nitrogen purging should not be required.
- Mechanism ensures stable interferometer with short warm up times
- Sealed and desiccated interferometer with protection against humidity Including built in Pletier dehumidifier and moisture resistant coating on beam splitter surfaces.
- Light source should be ceramic instead of conventional Ni based.
- FTIR should be with advanced diagnostics functions with on screen display of instrument status and condition
- Automatic Atmospheric background correction must be available in the FTIR.
- FTIR should have Powerful Windows based 32-bit to comply with FDA 21 CFR, Part 11
- FTIR should have Comprehensive data processing capability including advanced quantitation protocols
- FTIR should be quoted with Wide range of accessories – DRS for powder instead of KBr die, Demountable cell for liquid or ZnSe Optics (in lieu of KBr optics useful for operation in high humidity)
- Details of the software package (including necessary software for control, data acquisition, tool processing and analysis for complete equipment.
- If any Calibration standards available for FTIR should be included in the offer.
- Principal should provide a certificate that they will provide the spares in future.
- To provide the maintenance support after sales, the principal of companies should also mention their maintenance network in India.
- Installation of the instrument and performance demonstrated at site.
- Onsite warranty and sufficient Training at site for learning the basic operation.
- Tender should have the costing of each unit/component/accessories separately.
- FTIR tutorial
- PC & Printer for required specification should be quoted as optional.
- Offer should be included branded UPS optionally to take care of the system and controller.
- Operation on 230V AC, 50 Hz mains supply.

Fourier Transform Infra-Red Spectrophotometer (FTIR) (PC based) without upgradeable Model should also be quoted with almost similar specifications mentioned above.

(2) UV- VIS Spectrophotometer

- **Stand-alone** operation and **also complete control through PC** with Spectroscopy software supplied as standard. Equipment should be provided with USB ports to store data in USB pen drive, to connect a PC and Printer.
- LCD based **True double beam with resolution of 1nm over entire wavelength range of 1,100 to 190 nm.** UV Should also be operated through software.
- Ultra low Photometric noise of <0.00005 Abs with new optical design.
- Wide Dynamic Photometric range of -4 to +4 Abs and 0 to 400 %T.
- Wavelength accuracy of + 0.1nm for D2 spectral line.
- Wavelength reproducibility of + 0.1nm.

- Wavelength setting and display in steps of 0.1nm
- Baseline Stability 0.0008 Abs/hr.
- High sensitivity matched pair Silicon Photodiode detector.
- Details of the software package (including necessary software for control, data acquisition, tool processing and analysis for complete equipment.
- If any Calibration standards available for UV-Visible Spectrophotometer should be included in the offer.
- Principal should provide a certificate that they will provide the spares in future.
- To provide the maintenance support after sales, the principal of companies should also mention their maintenance network in India.
- Installation of the instrument and performance demonstrated at site.
- Onsite warranty and sufficient Training at site for learning the basic operation.
- Tender should have the costing of each unit/component/accessories separately.
- PC & Printer for required specification should be quoted as optional.
- Offer should be included branded UPS optionally to take care of the system and controller.

Built in validation program, diagnostic and security functions

Access control through password protection even in stand-alone mode

9 Hardware validation functions in stand-alone mode

Should be provided with following Operational modes as standard –

Photometric; Spectrum; Quantitation; Kinetics; Time Scan;

DNA and Protein Quantitation in stand-alone and PC controlled operation.

Additionally **Multi-Component measurement mode** in stand-alone operation of equipment.

User defined algorithms with Pass / Fail judgment in software

Customized report generation

Accessories:

Two pair of 10 mm quartz cell of 3 ml volume.

(3) FT-Raman Spectrometer

Software controlled FT-Raman Spectrometer system with following specifications

S.No.		Specification
IR Module		
1.	Optics	All optical surfaces should be Gold coated, self aligned for easy replacement by users Suitable high stability Interferometer with minimum 5 years warranty
2.	Spectral range	Spectral range 375 to 10000 cm ⁻¹ or more.


		Provision for expandable to 30 or lower to 25000 cm^{-1} or more at site in future
3.	Optical resolution	0.16 cm^{-1} or less
4.	Signal-noise ratio	50000:1 or more PP for 1 min. scan
5.	Fast scan	Minimum 58 spectra/sec or more @ 16 cm^{-1}
6.	Detector	DLaTGS in KBr window
7.	Source	Mid-IR source with 5 yrs warranty should be provided White light source should be provided Provision for mounted and computer controlled two source and two detector and operated through software should be supplied
8.	Beam splitter	KBr beam splitter or suitable beam splitter to cover the spectral range
9.	Wave number precision/accuracy	0.01 cm^{-1} or better
10.	System should have at least five port to accommodate hyphenated techniques like GC-FTIR, FT-Raman, TGA-IR, FT-Microscope etc. as and when required	
11.	System should have software controlled auto tuning/ auto alignment, auto component recognition and auto optimization of all accessories. Purgeable option should be provided.	
12.	Auto validation facility as per NIST traceable validation kit, certified/ASTM protocol	
13.	Software	Windows based IR software to controlled all accessories of FT-IR, FT-Raman and microscope system. Software should have facility for self diagnostic, data collection, processing, live data display, spectral quality check, spectral search from commercial library, creation of user generated library, automatic atmospheric correction, spectral interpretation, GLP compliance , QC etc.

Raman Module		
Raman Module should be coupled with FT-IR system		
1.	Spectral range	50cm ⁻¹ or less to 3500 cm ⁻¹ or more for Raman Stokes shifts
2.	Spectral resolution	1.0 cm ⁻¹ or better
3.	Source	High stability, low noise, high power 1064 nm software controlled laser source and power with minimum 1.0 W or higher
4.	Optics	Gold coated optics
5.	Beam splitter	CaF ₂ or XT-KBr
6.	Detector	Room temperature InGaAs detector
		Provision for dual detector choice for liq. Nitrogen cooled Ge detector -in future (as optional)
		Selection of detector through software
7.	Filters	Rayleigh rejection filter for stokes
8.	Heat filter	For minimizing thermal background. Cutoff signal above 2000 cm ⁻¹ for 1064 laser
9.	Sample compartment/ Stage	Large sample compartment to accommodate powders, liquids in vials, tubes, bottles etc.
		Micro and macro sampling capabilities in a single system
		180 deg reflection sample configuration
		Motorized view stage with x-y-z manipulator controlled through software with build in video and CCD system facility for automatic mapping, averaging etc.
		Spatial resolution for viewing sample is 50 micro meter
		The stage should enable to mount and accommodate samples like tablets, polymers, powders in horizontal position
10.	Validation	Certified standard should be provided for Raman Validation
11.	Software	Comprehensive built in software to controlled FT-Raman spectrometer and its accessories.
		Software should have facility for Raman validation using Certified standard
		Should have facility for FT-IR and FT-Raman library search
		Future up-gradation of the software free of cost

	12.	Library	FT-Raman forensic Library
			FT-Raman polymer Library
			FT-Raman Organic chemical Library
	13.	Consumable kit	Consumable sample kit, NMR tubes, vials etc should be supplied for minimum one year.
	14.	System should include FT-Raman Module installation kit, validation kit, spares parts for smooth running the system with certification	
	15.	Data station (IBM/ Dell) for controlled of full system- FT-Raman Manufacturer supply	P-IV Processor, RAM 1 GB or better, DVD combo drive, FDD, 80 GB HDD, 17''TFT colour Monitor, HP colour Leser printer, Window XP licensed software
	16.	One 10 KVa UPS with one hour backup (Libert/APC) should be provided	
	17.	2 years warranty of the full system should be provided	
	18.	ISO 9001/GLP/GMP/CE/CFR compliance	
	19.	All specification should be supported by printed literature of the manufacturer only	
	20.	Two scientist should be trained in analysis of the crime exhibits	
21.	AMC charges should be mentioned for at least three years after warranty period		

Item Set 3/ School of Biotechnology	(1) Analytical HPLC with UV Detector		
	Sr. No.	Description	Specification Required
	1.0	Pump / Solvent Delivery System – 2 Nos.	
	1.1	High Pressure Binary Gradient Pump with wide range of Flow	
	1.2	Flow Rate	: 0.00 - 10 ml/min in increments of 0.01 ml/min (extendable to 22.5 ml/min)
	1.3	Operating Pressure	: 6000 psi software programmable high and Low Pressure
	1.4	Flow Rate Accuracy	: $\pm 1\%$ of required Flow of water or MeOH
	1.5	Flow Precision	: $\leq 1\%$ RSD
	1.6	Gradient Composition curves	: Eleven (11) gradient curves including Liner, Step (2), concave (4), Convex (4)
	1.7	Number of Solvents	: 1 or 2
	1.8	Priming	: Self Priming for easy and speed of startup

1.9	Display	:	LCD
2.0	Manual Injector		
2.1	Manual Ejector	:	
2.2	Loop Size	:	50 µl, 200 µl
2.3	Syringe	:	25 µl
2.4	Inject signal Cable		
2.5	Operating Pressure	:	5000 psi
2.6	Mounting Brackets if required should be offered		
3.0	DETECTOR – Dual Wavelength UV-Visible Detector		
3.1	Wavelength Range	:	190 to 700 nm
3.2	Wave length Accuracy	:	± 1 nm
3.3	Wavelength Repeatability	:	± 0.1 nm
3.4	Spectral Band Width	:	5nm
3.5	Base Line Noise	:	12 x 10 ⁻⁶ AU 10 mm cell at 254 nm
3.6	Drift	:	1 x 10 ⁻⁴ AU/hour/ ⁰ C
3.7	Data Acquisition	:	Up to 80 Hz
3.8	Light Source	:	Single Deuterium Arc Lamp
3.9	Flow Cell	:	Separate Tapered Flow Cell for analytical 10 mm path Length
3.10	Lamp Optimization software for low noise performance in visible range to 700nm without lamp change.		
3.11	Detector should have facility for stand alone use as UV-VIS spectrophotometer for evaluating absorbance spectrum.		
4.0	Software		
4.1	Single point control of the entire HPLC		
4.2	Full 32 – Bit Architecture		
4.3	Windows 2000/XP, Windows 7.0 environment		
4.4	Standard data reports, online help and wizards		
4.5	Embedded Oracle / SQL/ ACCESS data base		
4.6	Data Integrity, Advanced Security, Audit Trails		
4.7	Report Publisher		
4.8	Verstality for multitasking without multiplier software package		
4.9	Different interface like Quick Start, Open Access or web user.		
4.10	Branded Pentium – IV, Core 2 Duo Processor, Computer with 4 GB RAM, 180 GB HDD, DVD ROM Drive, 19” TFT Colour Monitor, Microsoft Windows 7.0, DVD Player, Laser Jet Printer, Mouse, Manual etc.		
4.11	Should be able to fully control the machine and facility to control other detectors.		
5.0	Columns		
5.1	C-18 Analytical		
NOTE –			
<ul style="list-style-type: none"> • Vendor should be having sufficient facility to give after sales and service support for offered instrument. • Warranty period should be 05 years. • Vendor should be having a installation base for similar instrument in Madhya Pradesh preferable in Bhopal or in Indore. • Vendor should also have a facility / capability to provide application support in future if required. • Vendor should be having a capacity to maintain spares for offered 			

	<p>instrument at least for 10 years.</p> <p>(2) Fermenter</p> <p>Capacity : 5 - 7 liters Micro Control for pH (2 - 11)Temperature (Operating range : 14-45 °C, Sterlization temp : upto 150°C) Dissolved Oxygen, Conductivity etc. Suitable for animal and microbial cells</p>	
<p>Items Set 4/ School of Journalism</p>	<p>(1.a) Final Cut Studio Retail Set [01 no.]</p>  <p>Developer(s) : Apple Inc. Operating system : Mac OS X Type : Non-linear editing system License : Proprietary Website : Final Cut Studio</p> <p>Final Cut Studio is a professional video and audio production suite for Mac OS X from Apple Inc., and a direct competitor to Avid Media Composer in the high-end movie production industry. It is now only available to purchase through Apple's 1-800 number, therefore not online or in Apple Stores.</p> <p><u>Components</u></p> <p>Final Cut Studio version 3 contains six main applications and several smaller applications used in editing video. The major applications it includes are:</p> <ul style="list-style-type: none"> • Final Cut Pro 7 – "real-time editing for DV, SD and HD" • Motion 4 – "real-time motion graphics design" • Soundtrack Pro 3 – "advanced audio editing and sound design" • DVD Studio Pro 4 – encoding, authoring and burning. • Color 1.5 – a new color grading application adapted from Silicon Color's FinalTouch. • Compressor 3.5 – a video encoding tool for outputting projects in different formats. • Additional applications included are: <ul style="list-style-type: none"> • Cinema Tools 4.5 – tools specific to film processing. • Qmaster 3 – a distributed processing tool. <p>(1.b) Final Cut Studio Upgrade [01 no.]</p>	

(2) Design Machine**[01 no.]**

Apple MC309HN/A

iMac 21.5" Quad-Core i5 2.5GHz/4GB/500GB/Radeon HD 6750M 512MB

Specifications

Brand	Apple
Model	MC309HN/A
Processor	2.5GHz quad-core Intel Core i5 with 6MB on-chip shared L3 cache
Processor Description	Quad-core Intel Core i5
Memory	4GB (two 2GB) of 1333MHz DDR3 memory
Hard disk	500GB (7200 rpm) hard drive
ODD	Slot-loading 8x SuperDrive with 4x double-layer burning (DVD±R DL/DVD±RW/CD-RW)
Graphics	AMD Radeon HD 6750M graphics processor with 512MB of GDDR5 memory
Monitor	21.5-inch (viewable) LED-backlit glossy widescreen TFT display with support for millions of colors, Resolution: 1920 by 1080 pixels
LAN	10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)
Audio	Built-in stereo speakers, Two internal 20-watt high efficiency amplifiers, Headphone/optical digital audio output (minijack), Audio line in/optical digital audio input (minijack), Built-in microphone, Support for Apple iPhone headset with microphone
Key board	Full-size keyboard with 78 (U.S.) or 79 (ISO) keys including 12 function keys, 4 arrow keys (inverted "T" arrangement)
Mouse	Smooth, seamless Multi-Touch surface with support for simple gestures (scrolling and swiping). Click and double-click anywhere. Ambidextrous construction accommodates left- and right-handed users.
Speaker	Built-in stereo speakers
Cabinet	An all-in-one design for a small footprint.
Ports	One Thunderbolt port on 21.5-inch iMac, Two Thunderbolt ports on 27-inch iMac Mini DisplayPort output with support for DVI, VGA, and dual-link DVI (adapters sold separately), One FireWire 800 port; 7 watts, Four USB 2.0 ports, SDXC card slot, Slot-loading 8x SuperDrive with 4x double-layer burning (DVD±R DL/DVD±RW/CD-RW), Audio in/out, 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector), IR receiver
OS Installed	Mac OS X Snow Leopard
Bundled Software	Includes iTunes, Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, Xcode Developer Tools

Special Feature	FaceTime HD camera, Simultaneously supports full native resolution on the built-in display and up to a 30-inch display (2560 by 1600 pixels) on an external display, Support for extended desktop and video mirroring modes, Solid-state scrolling trackpad for precise cursor control; supports inertial scrolling, pinch and expand, swipe, three-finger swipe, four-finger swipe, tap, double-tap, rotate, screen zoom, scroll, click and drag, click drag and lock, secondary click A and B
Warranty	1 Year

**(3) Design Machine [01 no.]
Mac Book 13" Dual Core i5 2.3 GHz /4GB/320GB/HD Graphics/SD**

MacBook Air 11" Core 2 Duo 1.4GHz

Introducing the new MacBook Air, the most mobile Mac in every way, shape, and form. It features all-flash storage, a Multi-Touch trackpad, a long-lasting battery, a high-resolution display, an Intel Core 2 Duo processor, and NVIDIA graphics.

1.4GHz Intel Core 2 Duo processor with 3MB on-chip shared L2 cache

2GB of 1066MHz DDR3 SDRAM onboard (4GB maximum)

64GB Flash HDD

11.6-inch (diagonal) high-resolution LED backlit glossy widescreen display

NVIDIA GeForce 320M graphics processor with 256MB of DDR3 SDRAM

AirPort Extreme Wi-Fi wireless networking4 (based on IEEE 802.11n specification)

IEEE 802.11a/b/g compatible

Bluetooth 2.1 + EDR (Enhanced Data Rate) wireless technology

You get:

MacBook Air

45W MagSafe power adapter

AC wall plug + power cord

Printed and electronic documentation

Software Reinstall Drive

Software included Mac OS X Snow Leopard & iLife:

Includes iTunes, Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, and more. iLife Includes iPhoto, iMovie, GarageBand, iWeb, and iDVD

(4) Camera specifications as per Sony PD-1777

- **Lens:** Sony G Lens, 20x (optical), f = 4.1 to 82mm, f = 29.5 to 590 mm at 16:9 mode, f = 36.1 to 722 mm at 4:3 mode, filter diameter: 72mm
- **Built-in filters:** Clear, 1/4, 1/16, 1/64
- **Imaging system :** 1/3 inch-type, progressive 3 ClearVid CMOS Sensor system with Exmor technology
- **Picture elements:** Approx. 1,037,000 pixels (effective), approx. 1,120,000 pixels (total)
- **Focus:** Auto, manual (focus ring/one push auto/infinity/AF assist/focus

	<p>macro) White balance :Auto, one-push auto (A/B positions), indoor (3200 K), outdoor (selectable level -7 to +7, approx. 500K/step), manual WB Temp (selectable 2300K to 15000K, 100K/step)</p> <ul style="list-style-type: none"> • Shutter speed: Auto 1/50 - 1/2000 Manual 1/4 - 1/10000 • Gain selection: -6, -3, 0, 3, 6, 9, 12, 15, 18, 21 dB • Minimum Illumination: 1.5lux (auto gain, auto iris, 1/25 shutter) • Recording format: DV-CAM, DV SP 576/50i (PAL) • Playback/Recording time: DV SP Max. 63 min with PHDVM-63DM cassette DV-CAM Max. 41 min with PHDVM-63DM cassette • Audio/Video output: 10-pin connector A/V OUT jack (composite and unbalanced audio x2ch with the supplied cables) • DV input/output: i.LINK interface (IEEE 1394, 4-pin) • XLR audio input: XLR 3-pin female x 2ch • Headphones: Stereo mini jack (ø3.5 mm) • LANC: Stereo mini-mini jack (ø2.5 mm) • LCD viewfinder: 0.45 inch-type (Viewable area measured diagonally), approx. 1,226,880 dots (852 x 3[RGB] x 480), 16:9 aspect ratio LCD monitor 3.2 inch-type (Viewable area measured diagonally), XtraFine LCD, approx. 921,600 dots, hybrid type, 16:9 aspect ratio • Mass: Approx. 2.2 kg (5 lb 1 oz) (w/o tape, battery) • Dimension (W x H x D): Approx.169 x 188 x 451mm (6 3/4 x 7 1/2 x 17 7/8inch) (with lens hood, microphone and large eye cup) • Power requirements: DC 7.2 V (battery pack), DC 8.4 V (AC adaptor) • Power consumption :DVCAM/DV Approx. 6.8 W (with LCD viewfinder ON) Operating temperature 0 to 40 °C (32 to 104 °F) • Storage temperature :-20 to 60 °C (-4 to 140 °F) • Flash modes: Auto, Fill-in, Red-Eye reduction, Slow Sync, Off <p><i>Supplied Accessories</i></p> <ul style="list-style-type: none"> • Ac Adaptor: AC-L100 • Cables: A/V Composite Connecting Cable • Lens protection: Lens hood with lens cover • Backup battery: Lithium battery (CR2025) • Other accessories: Shoe adaptor • Viewfinder accessories: Large size eye-cup • Remote Control Unit: RMT-831 wireless Remote Commander • Documentation: Operating instructions (CD-ROM), Printed operating instructions
<p>Item Set No. 5/ UGC Sports/Physical Education/ Women Hostel</p>	<p>(1) Gymnastics equipments as per manufactured by STAG.</p> <p>A. Vaulting Table [01 No.] Length : 120 c.m. Width : 95 c.m. (Adjustable height 105 c.m. to 135 c.m. with safety padding)</p> <p>B. Spring Board [02 No.] Length : 120 c.m. Width : 60 c.m.- 70 c.m.</p>

Height : 20 c.m. + 2 c.m. cushion cover
(Spring Board of laminated plywood steel frame with 5 x heavy duty coil springs upholstered with high quality carpet. Size 1200 x 700 x 220 mm)

C. Balancing Beam [01 No.]

Height for 1.10 c.m. to 1.50 c.m.
Base and Support pipe : 75 mm round x 3 mm thick
(Made of High Quality materials as per regulations)

D. Parallel Bars [01 No.]

Length : 350 c.m.
Vertical axis of profile 5 c.m.
Horizontal axis of profile 4 c.m.
(Height of upper edge measured from floor to near the support - 200 c.m.)
Distance between joints of attachments – 230c.m.
Distance between bars – 42 c.m. to 52 c.m.
Made of heavy high quality tubular structure with double locking latest spring safety system. Made as per F.I.G. specifications adjustable height from 1.30 mtr to 2.05 mtr
Size – 3.50 mtr Fibre Glass Rails/Bars)

E. Mini Trampoline (1.20 x 1.20 mtr) [01 No.]
(Made of tubular steel and heavy duty spring with protective foam padded cover)

F. Trampoline (5.20 x 3.15 mtr) [01 No.]
(With safety padding, Made of tubular steel and heavy duty spring.)

G. Landing Mats (1 x 2 mtr, Thickness Standard Competition Size)[20 No.]
(Height of the mats 20c.m.)

H. Hoops : The hoop may be made of plastic or wood. Its interior diameter is from 80 to 90 cm, its minimum weight is 300gm. The hoop must be rigid enough to retain its shape [05 No.]

I. Balls : Ball made of rubber or a synthetic material. It is 18-20 cm in diameter and weight 400g. [05 No.]

J. Ribbon : The ribbon made of satin (or a similar material without starch) is at least 6m long and 4-6 cm wide. The stick is of 1cm diameter and a length from 50-60 cm. t is usually made of wood, bamboo, plastic or fibreglass. Its maximum weight is 35 gm. [05 No.]

(2) High Jump Landing Pit manufactured by STAG/VINEX.
(6 m x 4m x 70cm,) [01 No.]
High Density Foam (Competition Model)

(3) Cricket Bat(Match Quality) [12 No.]
BDM Dynamic Power

<p>(4)Weight Lifting Set (International Standard)</p>	<p>[01 no.]</p>
<p><u>UGC Merge scheme (Infrastructure development + Adventure sports)</u></p>	
<p>(4)Treadmill : Fitness world, 5555 Pro Commercial Motorized Treadmill</p>	<p>[02 No.]</p>
<p>(5) Bowling Machine Cricket manufactured by Star (Advance Quality)</p>	<p>[01 No.]</p>
<p>(6) Weight Training Multi Gym (Minimum 10 Station) manufactured by Pro Body Line /Fitness world.</p>	<p>[01 No.]</p>
<p><u>WOMEN HOSTEL</u></p>	
<p>(1) Pro Commercial Motorized Treadmill</p>	<p>[10 no.]</p>
<p>Motor Power : 3.5 HP AC (Continuous)7.0 HP AC(Peak) Speed :8.0-22 Km/h(0.5-13. 7 mph) Incline: 0. 15 Levels Belt Size :22” x 62” Max User Weight: 180</p>	
<p>(2)Platinum Bike</p>	<p>[05 no.]</p>
<p>Display Monitor –Speed ,time ,distance & Calories , Adjustable Seat Height. Adjustable resistance level with control knob. Water bottle with holder .</p>	
<p>(3)Vinyl Dumbbells(up to 20 Kg) Complete Set</p>	<p>[05 no.]</p>
<p>(4) Multi Stepper With Twister and Dumbbells</p>	<p>[05 no.]</p>
<p>(5) Four Station Gym</p>	<p>[05 no.]</p>
<ul style="list-style-type: none"> • Study frame Structure • Covered weight Stacks for safety and attractive looks • PVC weight stacks. • Works outs- Bench Press (seated) for upper and middle chest. 	

	<ul style="list-style-type: none"> • Bent over Pulley. <p>(6) Abs Pro [05 no.]</p> <ol style="list-style-type: none"> 1. Folds Out to a 200 stretch. 2. Cushioned seat for comfort and stability. 3. Folds up for easy storage. <p>Dimension :136* 67* 115 cm.</p> <p>(7) Stepper [05 no.]</p> <p>Breaking System: Manual Magnetic Fly Wheel :280 mm& 7 kg Resistance Level :8 Levels Programs : 30 Presets ,2 Manuals & 1 HRC, LCD Display –Speed .Time ,Distance ,Calories ,Pulse, ODO Breaking System: Manual Magnetic Fly Wheel :280 mm& 7 kg Resistance Level :8 Levels Programs : 30 Presets ,2 Manuals & 1 HRC, LCD Display –Speed .Time ,Distance ,Calories ,Pulse, ODO</p> <p>(8) Gym Ball [05 no.]</p>
<p>Item Set No. 6/ School of Energy & Environmental Studies</p>	<p>(1) Energy Audit Van fitted with all instruments & equipments installation and commissioning in it [01 no.]</p> <p>(1) Maruti ECO</p> <p>(2) Energy Explorer [01 no.]</p> <p>Sensors: all sensors with accessories Display Screen LCD 320×320. Colour for graphic</p> <p>Power Supply: Mains: Desk top Power Supply Battery: 2 Independent battery compartments, in all there should be Rechargeable AA NiMh Batteries</p> <p>Voltage Input: Voltage Input: double scale 500/1000V; accuracy 0. 2% ± 0.05% full scale Voltage inputs rating: 600 V CAT III</p> <p>Current Inputs:</p> <p>Current inputs for exchangeable flexible current transducers without external</p>

amplifiers (1000Arms) or CT Clamps (1000A/1Vac); Accuracy: + 0.2% ± 0.05% full scale (± Clamp Error). 1 Auxiliary/Neutral Input Channel for CT Clamp with 0-1 Vac; accuracy ± 0.2% ± 0.05% full scale (± clamp error)

Fundamental Frequency Range:

The Frequency range is measurable from 40 to 80 Hz. The measurement of Harmonics is up to 31st order.

Internal Software:

Window/Linux operative System Embedded.

The Software should be Up –datable/ up-gradable by the user via internet.

Memory

Removal Compact Flash of 2 GB (supports up to 8 GB and more according to Available Size).

Languages: English

(3) Demand Analyser/ Clamp-on Power Meter

[01 no.]

Sensors: **all sensors with accessories**

- Measuring Function:
V/A/Active power/Reactive power/Power factor(lead/leg)/Frequency/Active electric energy/Regenerative electric energy(Only for data saving)
- Input Voltage:
150/300/450V Range(CAT III 600V) Max:450V+10%
- Current:
5/10/20/50/100/200/500/1000A Range
with suitable Probes
- Wiring Method:
Single-phase 2-wire, Single-phase 3-wire, 3-phase 3-wire,
Single-phase 2-wire 2-load system
Single-phase 2-wire, Single-phase 3-wire, 3-phase 3-wire, 3-phase 4-wire,
Single-phase 2-wire 2 or 3-load system
- Accuracy:
1.2%(0.8% rdg + 0.4% rng)
(Depend on Clamp probe to use)
- Power : AC100 to 240V (CAT II) Power supply from the measuring circuit using with power supply cable.

(4) PORTABLE FLUE GAS ANALYZER

[01 no.]

Operating Temperature Range : 25°C to 350°C

Battery Rechargeable Ni-Cd, Life 4-5 hours, charge time 2 hours

Charger Input Voltage 230V; 50 AC

Fuels Natural gas, light oil, heavy oil, propane, butane, coal, coke

Display LCD

Data Logging / Printing USB/ RS232 or parallel port

Time and Date 24 hour real time clock

Printer Impact with a replaceable ribbon

Certification Designed to meet BIS or BS7927 British Standard for portable flue gas

analyzers

Probes with cable length minimum 10 m

Construction Pistol grip; 250 mm or more stainless steel probe length; depth gauge; 2500 mm or more hose length

K-type Thermocouple Accuracy $\pm 0.3\%$; or $\pm 1^\circ\text{C}$ ($\pm 1.8^\circ\text{F}$)

Maximum Temperature 800°C

and

High temperature to 1,100°C, 1.0 m insertion length

Gases Range Resolution Accuracy

Oxygen 0 - 25%, Accuracy $\pm 0.1\%$ - 0.3%

Carbon Monoxide 0 - 10,000 ppm, Accuracy ± 1 ppm for <1000 ppm; and ± 5 ppm for > 1000 ppm

Nitric Oxide 0 - 1,000 ppm, Accuracy ± 1 ppm for <1000 ppm; and ± 5 ppm for >1000 ppm

Carbon Dioxide (Calculated) 0 - 25%

CO/CO2 Ratio 0 - 0.9999

Combustion Efficiency 0 - 100%

With following Sensors

Range Resolution Accuracy

Nitrogen Dioxide 0 - 2000 ppm, Accuracy ± 1 ppm for <100 ppm; and ± 2 ppm for >100 ppm

Sulfur Dioxide 0 - 2,000 ppm, Accuracy ± 1 ppm for <1000 and ± 5 ppm for >1000 ppm

Hydrogen Sulfide 0 - 200 ppm, Accuracy ± 1 ppm <40 ppm; and ± 2 ppm for >40 ppm

Hydrogen Chloride 0 - 50 ppm, Accuracy ± 1 ppm for <40 ppm; and ± 5 ppm for >40 ppm

High Capacity Carbon 0 - 100,000 ppm, 1 ppm for <1000 ppm; and ± 5 ppm for >1000 ppm

Monoxide (Instead of Standard) >100 ppm; Accuracy $\pm 5\%$

Draught / Pressure

Measurement Range Accuracy ± 150 mbar (± 61 in WG)

Resolution 0.01 mbar (0.4 in WG)

Accuracy $\pm 0.5\%$ fsd measured at 50 mbar (20 inWG)

K-Type Thermocouple Accuracy $\pm 0.3\%$; or $\pm 1^\circ\text{C}$

(5)Infrared Thermometer

Accuracy* $\pm 1\%$ rdg

Range -23 to 871°C

Emissivity adjustable

Distance to Spot Size Ratio 30:1

Ambient Target Temp Comp. Analog Output, 1 mV/deg ;

RS-232 required

Data Storage required

Laser Sight (Built-In) dot/circle

Distance Measuring Required

(6) Laser Thermometer

Accuracy* $\pm 1\%$ rdg
Range -05 to 1200°C
Emissivity adjustable
Distance to Spot Size Ratio 30:1
Ambient Target Temp Comp. 1 mV/deg ;
RS-232 required
Data Storage required

Distance Measuring Required

(7) Digital Photo Tachometer

Display: 5 digits, 31mm blue backing LCD display
Test Range: 2.5 to 99,999 RPM (r/min)
Total Test Range: 1 to 99,999
Resolution: 0.1 RPM (2.5 to 999.9 RPM)
1 RPM (over 1,000 RPM)
Accuracy: $\pm (0.05\% + 1 \text{ digit})$
Test Range Select: Automatic
Detecting Distance: 50 to 500 mm / 2 to 20 inch (Laser Photo)
Memory: Max. Value, Min. Value, Last Value.
Battery: 4×1.5V UM-3 battery or to connect the DC 6V Regulated power supply
Power Consumption: Approx. 50mA
Operation Temp.: 0 to 50 °C

(8) Junker Gas Calorimeter

Range:
800-26000 kCals/m²
120 – 300 B. Thu/Ft³

Equipment should be consists of calorimeter, pressure governor, Non-recording 1 Liter flow meter and is supplied with 2 liters and 50 ml measuring jars, three Digital thermometers and flexible tubing.

Optional : RS232 compatible

(9) Digital Humidity meter

Display temperature, humidity & time simultaneously
Memory of Max & Min measuring value
12-hour / 24-hour displaying system selectable
0 C/ F unit selectable
Alarm function

Desk-top placing or Wall Hanging
Range : Temperature : -50 to 70 C
Humidity : 10 to 99 % RH

	<p>(10) Anemometer with continuous recording</p> <p>Velocity Range 0- 35 m/s Memories data storage 7 days</p> <p>Compatible with computer</p>
<p>Item Set 7/ School of Electronics</p>	<p><u>From UGC XI Plan Grant</u></p> <p>(1) Computer Peripherals & Accessories</p> <p>(a) Logitech/iball/Frontech/Intex/Techcom Cord Mouse [30 no.] 2 Button optical with Scroll Button</p> <p><i>System Requirements</i></p> <ul style="list-style-type: none"> • Windows-based computer <ul style="list-style-type: none"> ○ Windows® XP, Windows Vista®, Windows® 7 ○ PS2 port/USB port • Linux-based computer <ul style="list-style-type: none"> ○ Linux 2.6 (RHEL) <p>(b) Logitech/iball/Frontech/Intex/Techcom Corded Keyboard Standard 105 Keys USB [15 no.] PS/2 [15 no.]</p> <p><i>System Requirements</i></p> <ul style="list-style-type: none"> • Windows-based computer <ul style="list-style-type: none"> ○ Windows® XP, Windows Vista®, Windows® 7 ○ PS2 port/USB port • Linux-based computer <ul style="list-style-type: none"> ○ Linux 2.6 (RHEL) <p>(c) DVD writers [04 no.]</p> <p>LG/SONY/SAMSUNG/ASUS CD-R/RW, DVD-R/RW, DVD-ROM/RAM Min 16X Writing Speed/higher</p> <p><u>From Departmental Funds/ UGC XI Plan MERGE SCHEME</u></p> <p>(1) Computer Peripherals & Accessories</p> <p>(a) DVD writers [16 no.]</p> <p>LG/SONY/SAMSUNG/ASUS CD-R/RW, DVD-R/RW, DVD-ROM/RAM Min 16X Writing Speed/higher</p> <p>(d) Laser printer Toners (In original packing with date of supply within 6 month of manufacturing)</p>

Toners of Laser Printer(HP) 388A [15 no.]

Toners of Laser Printer(HP) 436A [5 no.]

Toners of Laser Printer(HP) 435A [5 no.]

(2) ADAC250 High-speed dual A/D and D/A FMC module [02 no.]

Two, 250 MSPS, 14-bit ADCs

–Two, 1 GSPS, 16-bit DACs

–Supports multiple clock and reference configurations

–Versatile and industry-standard VITA 57.1 FMC module

–Plug & Play with Lyrtech’s μ TCA Perseus AMCs

–Integrated programmable gains on both converters

–Wideband, AC-coupled I/Os

–DAC capable of 2–4 \times interpolation modes (low pass/high pass), coarse mixing, offset adjustments, and delay adjustments

–Equipped with an onboard, low-jitter reference clock and synchronization PLL (AD9511)

–Supports external or FMC-driven reference clocks for synchronized multiboard/multichannel applications

–Supports external or FMC-driven sampling clocks(AD9511 with the PLL bypassed) for phase-coherent multiboard/multichannel applications

–Supports external triggers for event-based acquisition

(3) ARM

RealView ARM Developer Kit Nexperia with Target/Evaluation Boards [2 No.]

(4) Smart Phones/ Pocket PC for students experiments

Minimum Features includes:

- GPS enabled
- WiFi Enabled
- Maps
- Touch Screen with 3.5” display

(a) Android OS [01 no.]

(b) Windows 7 OS [01 no.]

(c) Symbian OS [01 no.]

(d) Apple iPhone [01 no.]

(e) Blackberry [01 no.]

(5) GPS Receivers/tracker

Handheld GPS receiver with WiFi and MAP display screen with perpetual software license [8 No.]

(6) Software

(a) Oracle DB 11g Release 2 (10.2.0.1) Personal Edition for 5 users license [01 no]
Three Year licence

Database Tool should also support spatial database

(b) LabView Toolbox for Sound and Image Processing [01 no.]

(c) Antivirus with Internet Security 30- 50 Computers 70-100 Users Three Year
license

(d) On-line Fees Payment Submission Gateway through Web

(d) On-line Application Submission through Web

(7) Electronic Components for students project (Pricelist to be submitted along with discount offered on those prices) Numbers of items will be as per requirement

(a) Components

1. XBee Modem, Cable and Interfaces for the kits
2. GSM Modem, Cable and Interfaces for the kits
3. two motor 200rpm
4. IR Sensors 40 Nos.
5. Photo transistors 40 Nos. without base.

(b) AVR Kits

1. AVR Freeduino Serial 168
2. Andiono kit with driver [L293])
3. Sanguino MCU Board and cables

(c) 8051 Kits [05 no.]

8051 Flash Memory version +ADC + Serial Cable + 2x16 LCD Display with SMPS

(d) ARM Kits

1. ARM WinCE & Touch Screen based Kit [05 no.]
LPC3250 Rapid Development Kit
2. ARM 9 board with UBUNTU (Linux) Operating System [10 no.]
 - i. touch screen
 - ii. QVGA Display
3. ARM 9 board with Window CE 6.0 Operating System [10 no.]
 - i. touch screen
 - ii. 7" Display

(e) Kits

1. GSM Experimental Kit [02 no.]
A kit consist of GSM and GPRS modules for experiments and innovative projects
2. CDMA training Kit [02 no.]
3. ADC Experimental Kits [02 no.]
Kit for ASK –PSK –FSK experiments
4. Error detecting and correcting codes Trainer Kit [02 no.]
5. Digital coders: Encoders and Decoders Trainer Kit [02 no.]

<p>Item Set 8/ School of Comp Sc/ IT Centre/ Electronics/ Administrative Section</p>	<p>(1) e-filing Software</p> <p>(a) HINDI FILING OF THE APPLICATIONS/FORMS</p> <p>(i) e-filing software to modeled on e-filing software of Indian Income Tax in Excel, sheets, XML and acknowledgement(See ITR-2 e filing)</p> <p>(ii) Application Form</p> <p>Single sheet forms - Casual Leave, Earned Leave, Loan, House allotment, Guest accomodatio etc.</p> <p>Multisheet Form - Ph.D Form, Enrollment, Form, Eligibility Form etc.</p> <p>(iii) Forms should have column for Sanction by 3-7 officials and their remarks.</p> <p>(iv) Bid should include</p> <ol style="list-style-type: none"> a. Cost of basic software b. Cost of three year software maintenance c. Cost per single sheet form d. Cost per multisheet form. <p>(a) ENGLISH FILING OF THE APPLICATIONS/FORMS</p> <p>(i) e-filing software to modeled on e-filing software of Indian Income Tax in Excel, sheets, XML and acknowledgement(See ITR-2 e filing)</p> <p>(ii) Application Form</p> <p>Single sheet forms - Casual Leave, Earned Leave, Loan, House allotment, Guest accomodatio etc.</p> <p>Multisheet Form - Ph.D Form, Enrollment, Form, Eligibility Form etc.</p> <p>(iii) Forms should have column for Sanction by 3-7 officials and their remarks.</p> <p>(iv) Bid should include</p> <ol style="list-style-type: none"> a. Cost of basic software b. Cost of three year software maintenance c. Cost per single sheet form d. Cost per multisheet form. <p>(2) Tablet Computer run on Android 2.2 operating system[10-25 No.]</p> <p>10 inch version, resolution of 1024X600 pixels, built in camera of 1.3 mega pixels, location based services, GPS, ambient light sensor and accelerometer, expanded memory</p> <p>(3) MSI WindPad [10-25 No.]</p> <p>Windows 7 operating system, Intel mobile processor, two cameras for video chatting, Android Gingerbread OS, 2 MP camera, WiFi, and 4GB of internal storage expanded</p>
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	<p>to 32GB</p> <p>(4) Apple iPad 2 64GB 3G Wi-Fi Tablet [06 No.]</p> <p>Apple iPad 2 64GB 3G Wi-Fi (802.11a/b/g/n) Tablet offers 9.7-inches (diagonal) LED-backlit glossy widescreen Multi-Touch display with IPS technology of 1024x768 pixel resolution. This slate is based on Mac OS X v10.5.8 OS and is powered by Dual-core Apple A5 custom processor. Bluetooth 2.1 + EDR technology integrated with 5x digital zoom, 64 GB (6 numbers)</p>
<p>Item Set 9/ School of Instrumentation</p>	<p>(1) Digital Storage Oscilloscope</p> <ul style="list-style-type: none"> • Bandwidth: 200MHz or more • Four channel • Sampling Rate: 1GS/s or more • Record length 2000 or more • Connectivity through Labview Software <p>(2) Arbitrary Function Generators</p> <ul style="list-style-type: none"> • Dual channel or more • Sampling Rate: 1GS/s or more <p>Bandwidth: 100MHz or more</p> <p>(3) Digital Signal Processing Starter Kit</p> <ul style="list-style-type: none"> • 16-Bit TEXAS Digital Signal Processor with minimum 256 kB Flash memory and 512 kB RAM • Complete IDE with the efficient compiler • Assembler and debugger <p>(Easy to use for the analysis purpose)</p> <p>(4) Dual Phase DSP lock in amplifier</p> <ul style="list-style-type: none"> • Freq range: 1mHz to 102.4 kHz • Stability: 5ppm/°C • GPIB and RS232 interface <p>(5) Polarized He-Ne Laser</p> <ul style="list-style-type: none"> • 1.5 – 2 mW • Spot size: 2mm • Beam Divergence: 1.4m Rad <p>(6) Programmable Constant Source Meter</p> <ul style="list-style-type: none"> • Power Consumptin: 50W or more, $\pm 5A$ at $\pm 30 V$ or more • 5 and ½- digit resolution

- Basic Accuracy I = 0.025% or more
- Supports : RS 232 along with necessary software and hardware.
- Compatible to Labview software

(7) Digital Two Channel Nano-Voltmeter

- Voltage Range 10mV to 50V or more
- Resistance Range: 20 n Ω to 80M Ω or above.
- Compatible to Labview software

(8) Programmable High Resistance Meter/Electrometer

- Input impedance : 200 T Ω or more
- Optional accessories like tri-axial cables/various connectors are required
- Compatible to Labview software

(9) Turbo Molecular Pump Assembly and measuring units

- Complete turbo molecular pumping system of capacity 250-300 L/S with the suitable rotary vane pump along with computerized control system and measuring unit (probe: Cold cathode gauge) for the optimization use of the system
- Connection CF 150/CF 100
- Final pressure : 1×10^{-9} mbar or better

(10) Ultra High Vacuum Chamber

(a) Substrate Holder with Rotation

- It will hold a substrate of 50- 100 mm diameter. Two different temperature substrate range is required: (i) Room Temperature to 1200 K, (ii) 77 K to Room Temperature, along with temperature controller with a stability of ± 2 K. The rotation of the substrate can be done by computer controller assembly. The substrate holder to be provided with heat shields to minimize heat loss to chamber. The substrate holder should have a shutter. X, Y and Z movement of heater after opening of chamber.

(b) Target Holder Plate

- It will hold four to six targets of 25 mm diameter each or better. Each target should be provided with motorized rotation around its own axis. The controller should also have interfaces with the laser for multi-layer deposition. Target to substrate distance will be between 70mm to 150mm

(c) Stainless Steel Ablation Chamber

- The chamber is to be made from SS 304 and electro-polished for UHV performance. The chamber size should be minimum 12 inch diameter or better. The assembly will have following ports:
 - (i) CF 150 3 nos. for target and heater flange and view port
 - (ii) CF 150/CF100 1 no for pump port
 - (iii) CF 40 6 nos, 2 for view port one for gauge and three spare

	<ul style="list-style-type: none"> (iv) CF 50/CF63 1 no for Laser port appropriate for 248mm wavelength (v) CF16, 4 no for gas inlet, air inlet and gauges (vi) This chamber is to be mounted on a sturdy steel frame on castors wheels (vii) Minimum pressure : 10^{-6} or better <p>(d) Gate Valve</p> <ul style="list-style-type: none"> • One manual gate valve of CF 120 size to be provided. This gate valve could be motorized if necessary <p>(e) Gas Valve</p> <ul style="list-style-type: none"> • One electro pneumatically operated gas valve to be provided. SS tubing will also be provided from MFC/needle valve to the gas valve <p>(f) Pumping Valve</p> <ul style="list-style-type: none"> • Two manual right angles valves to be provided. One will be installed on the chamber and another will be in the fore line <p>(g) Vent Valve</p> <ul style="list-style-type: none"> • One manually operated vent valve to be provided <p>(h) Lens holder assembly</p> <ul style="list-style-type: none"> • For XYZ movement of the lens. Includes S1UV grade fused silica lens and fused silica window <p>Frame for mounting all the above. Castors and legs with height adjustment. With windows based software.</p>
<p>Item Set 10/ School of Future Studies and Planning</p>	<p>(1) PowerSim Studio 8 (Academic) Software</p>
<p>Item Set 11/ Auditorium</p>	<p>(1) Auditorium LED Light</p> <ul style="list-style-type: none"> (a) Stage light LED : 1.120* 1/3 W LED RGB/RGBW 2.7/11/4 Channels, Voltage : 90-240V, 50/60Hz [05 No.] (b) DMX Control PAR 64, 3 colors + mixed color high power 1W LED [05 No.] (c) DMX Digital Light Controller with 24 or 36 input [01 Unit] <p>(2) Auditorium Sound System</p> <ul style="list-style-type: none"> (a) Line Array Speaker System [02 Sets] <ul style="list-style-type: none"> • 3-way full range • 2 x 6 in woofers (LF), Phase aligned

	<ul style="list-style-type: none"> • 2 x 6 in woofers (LMF) • 6 x 1 in dome tweeters (HF) • 3 Class – D amplifiers • And 1 x 500 watts flying sub woofer <p>(b) Mixing Console [01 No.]</p> <ul style="list-style-type: none"> • 24- or 32- Channel 4-bus • Premium Onyx mic preamps on every channel • 4-band Perkins EQ • 6 x 2 Matrix Mixer provides 2 additional mixer • 6 Aux sends with Pre/Post switches • 100 mm Panasonic faders • Built-in Stereo Compressor/Limited <p>(c) Reverb Unit [01 No.]</p> <p>Audio Inputs (2) ¼” TRS balanced or unbalanced Input Impedance 20k Ohms balanced, 10k Ohms unbalanced Input Level +4dBu Nominal, +20dBu Maximum Frequency Response 20 Hz – 20kHz, ref. 1kHz +/- 1dB THD+N <0.007% 20Hz – 20kHz Audio Outputs (2) ¼” TRS balanced or unbalanced Output Level +20dBu Maximum Dynamic Range >107 dB A-weighted A/D Converters 24-bit, 48 kHz</p> <p>(d) Microphone – Professional Cordless mics [04 No.]</p> <ul style="list-style-type: none"> • Mic stands big [05 No.] • Mic stands small/medium [05 No.] <p>(3) Carpet [Wall to wall]</p> <p>(4) Up gradation of A.C. Unit [As applicable]</p>
<p>Item Set 12/ Gyan Vani</p>	<p>(1) High end PC with professional Sound cards [03 No.]</p> <p>(2) Studio active monitors [02 No.]</p> <p>(3) Procaster Microphone with stand [01 No.]</p> <p>(4) Cardioids condenser mics. [04 No.]</p> <p>(5) Wireless STLs with [02 Sets]</p> <ul style="list-style-type: none"> • Audio Stereo codec (encode/decoder) for MPEG1&2 Layer 3 (MP3), PCM linear and alaw, u-law, 8-48k sample rate support • Encode and decode audio streams

	<ul style="list-style-type: none"> • 10/100 Mbit Ethernet interface • USB 1.1 interface for flash memory (FAT 16/32 file system support) • Wide range power supply input with low power consumption • AES/EBU (digital) and balanced analog stereo audio interfaces (input and output) • Two independent serial ports (RS – 232 and RS – 485) • IR decoding capability with optional serial port IR receiver • Four contact closure inputs and four relay outputs <p>(6) 12 lines 4 group built in FX processor mixing console [01 No.]</p> <p>(7) Phone in console with 2 phone lines [01 No.]</p> <p>(8) Rack or furniture to install equipment [As applicable]</p>
<p>Item Set 13/ School of Economics</p>	<p align="center"><u>Equipments and Infrastructure under Centre for Natural Resource Management</u></p> <p>(1) Camera (Handy cam)</p> <p>(2) Colour Television + Tata Sky DTH</p> <ul style="list-style-type: none"> ▪ TV-Panasonic TH-P42X30D Model (HD, Wi-Fi, USB Accessibility) ▪ Tata Sky DTH-(setup box with subscription of two months) <p>(3) Refrigerator (Between 200-250 ltr)</p> <p>(4) Audio System for Conference Room</p> <p align="center"><u>Equipment and Infrastructure Under UGC-SAP</u></p> <p>(1) Computer Soft wares Microsoft office 2007 multiuser, Tally, SPSS, PDF Converter, etc.</p> <p>(2) Reprographic Facilities</p>
<p>Item Set 14/ Institute of Engineering and Technology</p>	<p align="center"><u>(A)DEPARTMENT OF ELECTRONICS & TELECOMM- UNICATION ENGG.</u></p> <p>(1) DC & AC Power Supplies [08 No.]</p> <div style="border: 1px solid black; background-color: #e0e0e0; padding: 5px; margin-top: 10px;"> <p>Required Specifications:</p> </div>

1. Power Supply
 - a. DC Output :+/-0-12V,1A,
 - b. DC Output :0-5V, 2A,
 - c. AC Output :12-0-12V,2A
2. Setting Resolution V:10mV, I:5mA
3. Load Regulation $\pm(0.05\% + 10 \text{ mV})$,
4. Line Regulation $\pm(0.05\%+10 \text{ mV})$,
5. Current Limit adjustment 100mA to 1A
6. Internal Resistance <math>< 10 \text{ m}\Omega</math>,
7. Stability <math>< 2.5\text{mV}</math> at 30V, 3A
8. Switch able Dual 3 digit display AC & DC voltage and current
9. Operating Power Supply 230 V AC + 10%, 50 Hz
10. Hardcopy & Softcopy of Manual

(2) LCR Meter for L+Q, C+D,R+Q, |Z|+ θ , R+X etc measurements [03 No.]

Required Specifications

- Auto, Manual, L+Q, C+D,R+Q, [Z]+ θ , R+X, G+B, N+ θ , N-,+ θ , Vs + Vp M, L+ Δ L,
1. Equivalent Circuit: Series or parallel
 2. L : 0.01 uH to 99.99 H, Q : 0.0001 to 100,
 3. C : 0.001 pF to 99999 uF D: 0.0001 to 10,
 4. R : 1 m Ω to 99.9 M Ω , Q: 0.001 to 100,
 5. [Z] : 1 m Ω to 99.9 M Ω , θ : -180 to + 180 Deg,
 6. R : 1m Ω to 99.9 M Ω , X : 1m Ω to 99.9 M Ω ,
 7. N : 1 to 9999, θ : -180 to + 180 Deg,
 8. N-1 + θ N-1 : 0.0001 to 1 θ : -180 to + 180 Deg,
 9. Vs : 230V/N or 115 V/N , 0.01 V resolution,
 10. Vp : 115 V or 230 V AC,
 11. M : 0.01 uH to 99.99 H, L : 0.01 uH to 99.99 H,
 12. L : 0.01 uH to 99.99 H,
 13. AL : L/N² (N defined by user 1 to 999),
 14. Measurement Accuracy: +/- 0.2%,
 15. Test Frequencies: 100 Hz,120 Hz, 250 Hz,500 Hz,1 KHz,2.5 KHz,5 KHz, 7.8125 KHz, 12.5 KHz, 25KHz, additional user defined from 500 possible frequencies
 16. Equivalent circuit Mode: Series or parallel,
 17. Connection: 4 Wire Kelvin on BNC guarded connector for probes and fixtures connections,
 18. Zero compensation: Auto calibration on each frequency, open or closed.
 20. Operating Power Supply 230 V AC + 10%, 50 Hz
- Hardcopy & Softcopy of Manual

(3) Arbitrary Function Generator (25MHz)

[02 No.]

Required Specifications

1. Arbitrary Frequency Range: 10 μ Hz – 25 MHz
2. Amplitude :
 - Output Voltage: 5 mVpp – 10 Vpp (into 50 Ω) Resolution: 1 mV
3. Frequency response:
 - $f < 10$ MHz: $<+ 0.1$ dB 10 MHz $< f < 25$ MHz: $+ 0.2$ dB
4. DC offset Voltage range(AC + DC): $+ 5$ mV – 5 V (into 50 Ω)
5. Rectangle waveform
 - Rise fall time: < 8 ns Over Shoot: $<3\%$ typ
6. Pulse Waveform Range:
 - 100 μ Hz – 12.5 MHz
 - Amplitude: 5 mV - $+5$ V
 - Rise / Fall Time: <8 ns
 - Resolution: 5 ns
7. Ramp & Triangle waveform:
 - Range: 10 μ Hz – 5 MHz,
8. Arbitrary Waveform Range: 10 μ Hz – 12.5 MHz
9. Sample rate: 250 MSa/s
10. Amplitude resolution: 14 bit
11. Bandwidth(- 3 dB): >50 MHz
12. Non- Volatile memory: 512 kb.
13. Signal Output :
 - BNC socket (frontside),
 - Short-circuit – proof
 - External voltage $+ 15$ V max.,
 - Impedance: 50 Ω
 - Gate / Trigger input: BNC socket (frontside)
 - Impedance: 5 k Ω || 100 pF
 - Level: TTL (protected up to $+ 30$ V)
14. Edge:
 - Positive / negative (selectable), Pulse width: Min. 100ns
 - Sweep time: 1 ms – 500 s, Burst : Signal : All
15. Typ: Triggered, 1 – 50, 000 cycles, endless or Gate controlled
 - Waveform modulation: AM, FM, PM, PWM, FSK
16. Internal Modulation (ripple):
 - Sine, Rectangle, Triangle, Ramp,
17. Internal Modulation frequency: 10 μ Hz – 50 kHz
18. External Modulation Bandwidth (- 3dB): DC – 50 kHz (sampled with 250 kS/s)
19. Miscellaneous
 - Display: 3,5” color TFT QVGA 65 k colors
 - Interface: Dual interface USB / RS-232
 - Save / Recall memory: 10 complete setups
 - Operating Power Supply 230 V AC $+ 10\%$, 50 Hz
 - Hardcopy & Softcopy of Manual

(4) Mixed Signal Oscilloscope with Logic Analyzer [01 No.]**Required Specifications**

1. Vertical Deflection

- Channels
 - DSO mode:CH1,CH2,CH3,CH4
 - MSO mode :Ch1, Ch2, Logic channels(0....15).
 - Bandwidth (-3dB): 250MHz
 - Input sensitivity: 12 Calibrated steps;
 - CH1, CH2, CH3, CH4 : 1mV – 5V/div, (1-2-5 sequence) between calibrated steps.
 - Display range: 12 div x axis,20 div Y axis
- 2. Triggering**
 - Frequency Range: 0Hz – 300MHz
 - Operating Modes:
 - Slope /Video/Logic/Delayed/Event/Pulse
 - Video Pos/Neg/ Sync Impulse
 - Digital Mode Logic: AND /OR, TRUE / FALSE
 - Source: LCH 0..15
 - Switching Thresholds: TTL, CMOS, ECL, 2X user' –2 to +8V'
- 3. Horizontal Deflection**
- 4. **Domain:** Time, Frequency (FFT), Voltage (XY)
- 5. **Memory zoom:** Upto 100,000:1
 - Refresh operating mode: 20ms/div.....1ns/div.
 - Roll operating mode: 50s/div....50ms/div
- 6. Digital Storage:**
 - Acquisition (Real Time): 4 X 1.25 Gsa/s,2 X 2.5 Gsa/s
 - Logic channel: 16 X 1.25 Gsa/s
 - Acquisition (random): 25Gsa/s.
 - Memory: 4 X 2M pts, 2 X 4M pts
 - Reference Memories: 10 traces
 - Operating Modes: Refresh, Average, Envelope, / Roll: Free Run /Triggered, Peak detect
 - Storage formats: Signal can be stored in Screenshot, Binary, CSV, Hameg Real time format
- 7. Other Features**
 - Cursor Measurements: ΔV , Δt , $1/\Delta t$, V to GND, Ratio X, Ratio Y, Pulse Count, Vt to trigger Peak to Peak, Peak+, Peak-
 - Mathematical Functions: ADD, SUB, 1/X, ABS, MUL, DIV, SQ, POS, NEG, INV.
 - Formula Sets: 10 formula set with 5 Formulas each.
 - Sources: All channels, References & Math Memories.
 - Frequency Counter: 0.5 Hz to 300 MHz (6 Digit Resolution)
 - Interface (Plug in): Dual interface USB/RS 232,2X USB stick, DVI for External monitor.
 - Display: Colour TFT VGA
 - Accessories: 2 no. of 10:1 Switchable Probe, Optional: 8 Ch. Logic probe.
 - Pass/Fail Function: Able to create Mask, Mask around signal, user defined tolerances
 - Serial bus Decode: I2C,SPI,UART/RS232 Bus trigger & decode
 - Hardware accelerated decode in real time
 - Operating Power Supply 230 V AC + 10%, 50 Hz
 - Hardcopy & Softcopy of Manual
 - Standard Accessories : 16 logic probe , 4 probe with 10:1 attenuation , Line cord

(5) Combi Scope(100 MHz)

[01 No.]

Required Specifications

1. Vertical Deflection

- Channels: Analog : 2, Digital : 2
 - Invert: CH1, CH2.
 - Bandwidth (-3dB): 2 X 0 – 100 MHz
 - Rise Time: <3.5 nSec
 - Overshoot: Max 1%
 - Variable > 2.5:1 to >50V/cm
 - Y delay Line (Analog): 70ns

2. Triggering

- Frequency Range: 0 – 200MHz
- Operating Modes: Slope / Video
- HF: (30kHz – 200MHz); LF: 0 – 5kHz;

- Coupling AC: (10Hz – 200MHz); DC: (0Hz – 200MHz);
- 3. Video: Pos / Neg / Sync Impulse**
 - Digital Mode Logic: AND / OR, TRUE / FALSE.
 - Pre Post Triggering: -100% to +400% related to complete memory
- 4. Horizontal Deflection**
 - Analog Mode:
 - Time Base A: 0.5 s/cm – 50ns/cm
 - Time Base B: 20ms/cm – 50ns/cm
 - Accuracy +/- 3%
 - Digital Mode:
 - Memory ZOOM: Max.40,000:1
- 5. Digital Storage:**
 - Sampling Rate (Real Time) : 2 X 500Msa/s; 1Gsa/s interleaved
 - Acquisition (random): 10Gsa/s.
 - Memory: 1MSa per Channel
 - Reference Memories: 9
 - Operating Modes:
 - Refresh, Average, Envelope, / Roll: Free Run Triggered, Peak detect
 - Interpolation: Sinx /x, Dot join (Linear), Pulse
 - Display Refresh Rate: Max. 170s at 1 MPts.
 - Reference Memories: 9 with 2kPts each
 - FFT Analysis: Provided
- 6. Other Features**
 - Interface (Plug in): RS 232/USB
 - Component Tester: Provided
 - USB Host Interface : Provided
 - Display : CRT display
 - Facility of Auto Measurements of : Frequency, Period, V_{DC} , V_{pp} , V_{p+} , V_{p-} , V_{rms} , V_{avg}
 - Facility of Cursor Measurements like ΔV , Δt , $1/\Delta t$, V to GND, Ratio X, Ratio Y, Pulse Count , V_t to trigger Peak to Peak, Peak+, Peak-
 - Facility of Mathematical Functions ADD, SUB, 1/X, ABS, MUL, DIV, SQ, POS, NEG, INV.
 - Facility for setting Formula
 - Presence of Math Memory
 - Presence of Frequency Counter: 0.5 Hz to 1MHz(5 Digit resolution), >1 MHz to 200 MHz (6 Digit Resolution)
 - Facility of Component Tester
 - Standard Display
 - Hardcopy & Softcopy of Manual

(6) Universal Programmer & IC tester

[01 No.]

Required Specifications

1. Hardware
 - USB Port
 - 40 Pin ZIF socket no adapter required for DIP devices
 - Constructed around FPGA to achieve ultra high programming speed
 - Programs 89c58 in less than 4 sec
 - Over current./Over voltage protection
 - User selectable verification
 - Remote laptop programming
 - Over 45 different adapters
2. Software
 - Windows 98/SP2/NT/2000/XP/VISTA/ME
 - File formats: Binary/Intel Hex/Motorola S/Tektronics /and auto find formats
 - Identifies manufacturers and Types of E(E)PROMs
 - User friendly interfaces
 - OTP-SECURITY for AT86C5X
 - Mass production mode
 - Support all operations such as read/blank etc
 - Set addresses intelligently
 - Integrated editors to modify HEX/JDEC files with commands such as file/copy/move swap

- etc
- Support compilers for PLDs in JDEC format such as ABEL/CUPL/PALASM/OrCAD PLD
- Adjustable IC parameters
- 3. Digital IC Testers
 - Tests TTL 74XXX54/74(LS/HCT/HC/ALS/S/AS/F etc.) xxx series.
 - Tests 40XX,41XX,45XX CMOS IC's.
 - Addition of new devices by entering test vector tables of new devices to be tested.
- 4. Add on's
 - Built in 8 channel, logic analyzer/frequency generator 125 kHz/ frequency meter up to 100 kHz
- 5. Device support
 - EPROM
 - /EEPROMS:1567 Nos
 - SPROM'S:3657 Nos.
 - MCU's:796 Nos.
 - PLD's:88 Nos
 - SRAM /DRAM's: 152 Nos
- 6. Accessories:
 - USB connecting cable/AC adapter /Installation Software CD/User guide(Hardcopy and softcopy)

(7) Advance Digital Communication Training System [01 Each]

7.1 Analog Signal sampling/reconstruction kit [01 No.]

Required Specifications
Onboard Presence of <ol style="list-style-type: none"> 1. Sine Wave: <ul style="list-style-type: none"> ○ Frequency: 1 KHz, 2 KHz. ○ Amplitude: 0 - 5Vpp. 2. Sampling Clock: <ul style="list-style-type: none"> ○ Internal frequency: 2 KHz, 4 KHz, 8 KHz, 16 KHz, 32 KHz, and 64 KHz. ○ Duty cycle: 10 - 90% selectable in steps of 10%. 3. Sampling Methods: <ul style="list-style-type: none"> ○ Natural sampling circuit. ○ Sample and Hold circuit. ○ Flat Top sampling circuit. 4. Reconstruction: <ul style="list-style-type: none"> ○ 2nd order and 4th order low pass Butterworth filters with 3.4 KHz cut-off frequency.

7.2 PAM Time Division Multiplexer/ Demultiplexer [01 No.]

Required Specifications
1. Onboard Presence of <ol style="list-style-type: none"> 1. Sine Waves: <ul style="list-style-type: none"> ○ Frequency: 250Hz, 500Hz, 1 KHz, 2KHz ○ Amplitude : 0 - 5 Vpp 2. D.C. Signal : 0 - 5 V 3. Input Channels: 4 nos. 4. Multiplexing : Time Division Multiplexing. 5. Sampling Rate : 32KHz. 6. Modulation : Pulse Amplitude Modulation. 7. Receiver Clock: Phase Lock Loop generates receiver clock and channel information.

7.3 TDM Pulse Code Modulation/Demodulation kit

[01 No.]

Required Specifications

1. Onboard Presence of (for Modulation)
 1. **Sine Wave:**
 - Frequency : 500Hz and 1KHz.
 - Amplitude : 0 – 4 Vpp
 2. **D.C.**
 - Amplitude : 0 – 5 V.
 3. **Input Channels:**
 - 2 Channel Time Divisions Multiplexed and Pulse Code Modulated.
 4. **Synchronization Signal:**
 - Pseudo Random Bit Sequence Sync Code Generation.
 - Serial Data Pattern : 14 bit PRBS & 14 bit Data.
 5. **Parity Code Facility:**
 - Even, Odd, Hamming, None Parity.
 6. **Modes of Operation:**
 - FAST : 16 KHz / channel.
 - SLOW : 0.088Hz / channel.
2. Onboard Presence of (for Demodulation)
 1. **Input Channels:** 2 Channel Time Division Multiplexed Pulse Code Modulation receivers.
 2. **Receiver Clock:** Generated by Phase Lock Loop.
 3. **Parity Check Facility:** Even, Odd, Hamming.
 4. **Error Correction:** Hamming Code.

7.4 Data Conditioning & Carrier Modulation kit

[01 No.]

Required Specifications

1. **Onboard Presence of**
 1. **Data Simulator:**
 - On board 8 bit variable NRZ-L pattern.
 2. **Data Format (Coding):**
 - NRZ(Level), NRZ(Mark), NRZ(Space), Biphas (Manchester), Biphas (Mark), Biphas (Space), URZ, AMI.
 3. **On Board Carrier Sine waves:**
 - 500KHz(0 deg.), 1MHz(0 deg.), 1MHz(180 deg).
 4. **Carrier Modulation:**
 - ASK, FSK, PSK,

7.5 Data reconditioning and carrier demodulating kit

[01 No.]

Required Specifications

1. Onboard Presence of

1. Data Format (Decoding):

- NRZ(Level), NRZ(Mark), NRZ(Space), Biphas (Manchester), Biphas (Mark), Biphas (Space), RZ, AMI.

2. Carrier demodulation:

- ASK, FSK, PSK.

3. Receiver Clock:

- Generated by Phase-Lock Loop.

7.6 Delta/Sigma delta and adaptive delta modulation/Demodulation kit [01 No.]

Required Specifications

Onboard Presence of

1. Sine Wave:

- Frequency: 250Hz, 500Hz, 1 KHz, and 2 KHz.
- Amplitude: 0 – 4 Vp-p.

2. D.C.: 0 - 5V.

3. Sampling:

- Clock : 8 KHz, 16 KHz, 32 KHz, 64 KHz, and 128 KHz.
- Duty cycle: 50%.

Modulation Techniques:

- Delta Modulation,
- Sigma Delta Modulation.
- Adaptive Delta modulation.
- CVSD Modulation.

Compander:

- μ -law Compander and Expander.

7.7 PAM/PWM/PPM Modulation/ Demodulation kit [01 No.]

Required Specifications

1. Onboard Presence of

1. Sine Wave:

- Variable Frequency : 1Hz to 30Hz
- Amplitude : 0 - 2 Vpp.

2. Fixed Frequency : 500Hz and 1 KHz with Amplitude: 0 - 4 Vpp.

3. Sampling:

- Internal sampling clock : 8 KHz, and 16 KHz.
- Duty Cycle : 50 %.

4. Modulation/Demodulation Techniques:

- Pulse Amplitude Modulation/Demodulation (with variable clock 8 KHz, 16 KHz).
- Pulse Width Modulation/Demodulation
- Pulse Position Modulation/Demodulation

7.8 Study of framing and marker with voice coding kit

[01 No.]

Required Specifications

1. Onboard Presence of
 1. **Sine Wave**
 - Frequency : 1Hz to 10KHz
 - Amplitude : 0 - 2 Vpp.
 2. **Data Clock** : 512 KHz.
 3. **Framing** : Frame frequency of 8 KHz.
 4. **TDM** : 8 Channel (One for Marker, One for Audio channel and 6 channels for data switches with LED indication.)
 5. **Modulation Techniques:**
 - Pulse Code Modulation using CODEC Motorola MC145502.
 6. **Marker Indication:**
 - 8 Bit marker switch at both Tx & Rx Section with LED indication for 8 bits in Rx Section.

7.9 BPSK/DPSK/DEPSK modulation/Demodulation kit

[01 No.]

Required Specifications

1. Onboard Presence of
 1. **Data Simulator** : On board 8 bit variable NRZ-L pattern.
 2. **Clock Frequency** : 250KHz
 3. **Data Format (coding)** : Differential Encoding
 4. **On Board Carrier Sine Waves:** 500 KHz (0^0), 500KHz (180^0).
 5. **Carrier Modulation & Demodulation** : BPSK, DPSK, DEPSK.

7.10 QPSK/DQPSK modulation/Demodulation kit

[01 No.]

Required Specifications

1. Onboard Presence of (for Modulation)
 1. **Data Simulator:** On board 8 bit variable NRZ-L pattern.
 2. **Clock Frequency:**250KHz, BIT, Bit Clock and Word Clock
 3. **Data Format (coding):**
 - Dibit Pair (I & Q), Differential Encoding of I & Q Bits
 4. **On Board Carrier Sine Waves:**
 - 500KHz(0^0), 500KHz(90^0), 500KHz(180^0), 500KHz(270^0)
 5. **Carrier Modulation:** QPSK, DQPSK.
2. Onboard Presence of (for Demodulation)
 1. **Receiver Clock:** Generated by Phase-Lock Loop.
 2. **Data Format (decoding):**
 - Dibit Pair (I & Q), Differential Decoding of I & Q Bits
 3. **Carrier Demodulation:** QPSK, DQPSK.

7.11 Base band digital transmission system kit

[01 No.]

Required Specifications

1. Onboard Presence of
 1. **NOISE GENERATOR**
 - White Noise Source output
 - Amplitude: 0 to 2Vpp.
 2. **PRBS Generator**
 - 16 Bit switch selectable.
 - Clock rate: 16, 32, 64, 128, 256, 512 KHz, 1.024 MHz.
 3. **BIT ERROR RATE METER**
 - 4 Digit counters with 7 segment display drivers. Count up to 9999.
 4. **Display:** 4 Digit seven segment.

5. **DIGITAL MODULATION:**
 - Modulation technique : Pulse amplitude modulation.
 - Internal sampling clock : 16 KHz to 1.024MHz.
 - Duty cycle : 50%.
6. **TRANSMITTER FILTER:** 1st order Butterworth filter. Selectable switch with five different bands.
7. **RECEIVER FILTER:** 1st order Butterworth filter. Selectable switch with five different bands.
8. **CODING OPERATION:**
 - Scrambler : 16 bit data pattern.
 - Unscrambler : 16 bit data pattern.

7.12 QAM/DQAM Modulation/Demodulation kit

[01 No.]

Required Specifications

1. Onboard Presence of (for Modulation)
 1. **Data simulator** :On board 24-bit variable NRZ-L pattern
 2. **Clock frequency**: 250KHz
 3. **Data format (coding)**: Tribit coding (I,Q&C), Differential Encoding
 4. **On board carrier sine waves**:
 - o 500KHz(0 deg.), 500KHz(90 deg.), 500KHz(180 deg.), 500KHz(270 deg.)
 5. **Carrier Modulation**:
 - o 8-QAM/DQAM

2. Onboard Presence of (for Demodulation)
 1. **Receiver Clock**: Generated by Phase-Lock Loop.
 2. **Data Format (decoding)**: Tribit decoding (I, Q & C), Differential Decoding
 3. **Carrier Demodulation**: 8-QAM/DQAM

7.13 DPCM/ADPCM Modulation /Demodulation kit.

[01 No.]

Required Specifications	
1. Onboard Presence of (for Modulation & Demodulation)	
1. Sine wave	
o Frequency	:500Hz
o Amplitude	: 0 to 4 Vpp.
2. Sampling Technique	:Sample & Hold
3. Sampling Frequency	:16KHz
4. Data Clock	: 64,128, 256, 512 KHz.
5. Data transfer rate	: 64,128, 256, 512 Kbps.
6. ADC word length	: 8 bits.
7. Modulation Techniques	: DPCM and ADPCM.
8. Channel	:1 channel
9. Clock Frequency	: 64, 256, 512 KHz (ADPCM). 64,128, 256, 512 KHz (DPCM)
10. Channel operation	: Full duplex.
11. Coding	: μ -law.
12. Input Receiver Clock	: 64 KHz to 512 KHz.

7.14 Audio Input/Output kit

[01 No.]

Required Specifications

1. **Noise generator:**
 - Amplitude : 0 –2 V P-p
 - Signal Attenuation : 0 to input value
 - Input impedance : 600 ohms
2. **Voltage gain** : 1 to 100
3. **RC filter** : 3.4 KHz cut-off
4. **Maximum output voltage**
5. **e** : 5V
6. **Audio Output Kit:**
 - Input Impedance : 50 K Ω
 - Output Voltage : Adjustable
 - Speaker : 8 Ω , 0.5 W

7.15 Binary Data Generator

[01 No.]

Required Specifications

1. **Internal Clock Frequency** : 125 KHz, 250 KHz, 500 KHz.
2. **External Clock Frequency** : 125KHz to 1MHz
3. **Data Generator** : 8, 16 &24 bit binary data.

(8) Antenna Training System

Required Specifications

1. **RF Generator** : 750 MHz approx.(Output adjustable)
2. **Tone Generator** : 1KHz approx.(Output adjustable)
3. **Directional Coupler:** Forward & Reverse (Selectable)
4. **Matching Stub** : Slider type.
5. **Antenna Rotation** : 0-360 deg. Resolution 1db.
6. **Receiving Antenna** : Folded Dipole with reflector.
7. **Detector Display** : Level adjustable Meter.
8. **Power Supply** : 230 V \pm 10 %, 50Hz.
9. **Interconnections** : 4mm banana sockets.

Accessories

1. List of available antennas:

- Dipole $\lambda/2$, Folded Dipole $\lambda/2$, Dipole $\lambda/4$, Yagi UDA Folded Dipole (3E), Yagi UDA Folded Dipole (5E), Yagi UDA Dipole (7E), Yagi UDA Dipole (5E), Horizontal End Fed Hertz Antenna, Horizontal End Fed Zeppelin Antenna, Group plane Antenna, Ground Plane with reflector & director, Slot Antenna $\lambda/2$ Loop Antenna, Helix Antenna, $\lambda/2$ Phase Array, $\lambda/4$ Phase Array, Combined Collinear Array, Log Periodic Antenna, Rhombus Antenna, Cut Paraboloid Reflector Antenna.
2. Current Probe
 3. Mounting stands
 4. BNC – Tee
 5. BNC – BNC adapter M
 6. BNC – BNC adapter F
 7. BNC – BNC cable
 8. Screwdriver
 9. Hard & Soft copy of operating manual
 10. Student workbook
 11. Text Book “ Antennas” by John D. Kraus
 12. Polar graph
 13. Antenna fabrication kit
 14. Power cord
 15. Accessories case

(9) Analog Communication Training Kits

9.1 AM Transmitter

[01 No.]

Required Specifications

1. **Audio Oscillator(Sine wave generator)**
 - Frequency : 100Hz to 10 KHz
 - Amplitude : 0 to 2 Vpp
 - Audio Input : Audio preamplifier with microphone input.
2. **Audio Input** : Audio pre-amplifier with Microphone.
3. **Voltage Controlled Oscillator (VCO)**
 - Output Signal : Sine wave
 - Frequency Range : 1) 400 KHz to 500KHz 2) 400 KHz to 1500 KHz
 - Amplitude : 0 to 2Vp-p
 - Output Impedance : 50 ohm.
4. **Colpitt's Oscillator**
 - Frequency : 1 MHz
 - Amplitude : 0 to 2 Vpp

- 5. **AM/DSB/SSB/Modulator**
 - Modulation: Amplitude Modulation, Double Side band, Single Side band (USB & LSB)
 - Carrier input : 1-1000 KHz
 - Modulating Input : 0.1-100 KHz
 - Carrier Null : Adjustable
 - Output Amplitude : Adjustable
- 6. **Ceramic Filter**
 - Center Frequency : 455KHz
 - Bandwidth : 10 KHz +/- 3KHz.
- 7. **Band Pass Filter**
 - Central Frequency : 1.455KHz.
 - Bandwidth : 10 KHz +/- 3KHz.
- 8. **Output Amplifier**
 - Range : 535 KHz to 1650 KHz
 - Gain : Adjustable
- 9. **Antenna** : MW coil Antenna.

9.2 AM Receiver

[01 No.]

Required Specifications

1. **Super heterodyne Receiver:**
 - Frequency Range : 400KHz to 1.5MHz.
 - Intermediate Frequency : 455KHz.
 - Inputs : RF signal.
 - Output IF Frequency : 455KHz adjustable.
2. **RF Amplifier**
 - Range : 535 KHz to 1650 KHz
 - Gain : Adjustable
3. **Mixer (Frequency Converter)**
 - Dual Gate MOSFET
 - Input : Local Osc. & RF
 - Output Frequency : 455KHz adjustable
 - FI Filter : Dual Tune LC.
4. **Local Oscillator**
 - Output Signal : Sine wave for local oscillator input.
 - Frequency : From 900KHz to 2.1MHz. Gang Tunned
 - Amplitude : Adjustable from 0 to 2Vp-p.
 - Output Impedance : 50 Ohm.
5. **Beat Frequency Oscillator**
 - Frequency : Adjustable from 400 KHz to 500 KHz. With center frequency of 455 KHz
 - Amplitude : 0 to 2Vp-p.
6. **1st IF and 2nd IF Amplifier:**
 - Central Frequency : 455KHz.
 - Load Impedance : Variable R-L-C.
 - Gain : Automatic Gain Control.
7. **Diode Envelope Detector:**
 - Detection of the positive and negative envelope with variable RC filter DSB.
8. **Product Detector:**
 - Operating Frequency : Adjustable from 400KHz to 500KHz SSB.
 - Input Amplitude : 1Vp-p.
9. **Audio Output:**
 - Amplifier with Headphone.
 - Audio Amplifier Gain : 20dB.
10. **Receiving Media:**
MW coil Antenna and via cable.

9.3 FM Transmitter

[01 No.]

Required Specifications

1. **Synchronous Function Generator:**

- Waveforms : Sine, Triangular, Square
- Amplitude : 0 to 2Vp-p variable
- Frequency Range
 - 1) 1Hz to 10Hz.
 - 2) 10Hz to 100Hz.
 - 3) 100Hz to 1KHz.
 - 4) 1KHz to 10KHz.
 - 5) 10KHz to 100KHz.

2. **Audio Input** : Audio preamplifier with microphone

3. **Gain** : 20dB Adjustable output level.

4. **FM Modulators:** Varactor Modulator with carrier frequency adjustment, Reactance Modulator, FM via PM.

5. **Operating frequency:** Adjustable from 400 KHz to 500KHz

6. **Input amplitude** : 0.1 V p-p with integration circuit for indirect frequency modulation.

7. **PM Modulator:**

○ Operating frequency : Adjustable from 400 KHz to 500KHz

○ Input amplitude : 0.5 V p-p with integration circuit for indirect frequency modulation.

8. **Pre-Emphasis Circuit** : Time period of 50uS.

9. **Mixer (Frequency Converter):**

○ Dual gate MOSFET Inputs : Local oscillator and RF Signal.

○ Output IF Frequency : 455 KHz adjustable

○ FI Filter : Dual Tune LC.

○ Transmitter Output : 455KHz Frequency

9.4 FM Receiver

[01 No.]

Required Specifications

1. **Foster-Seely Detector:**
 - Operating frequency : Adjustable from 400 KHz to 500 KHz.
 - Input amplitude : 1Vp-p.
2. **Ratio Discriminator Detector:**
 - Operating frequency : Adjustable from 400 KHz to 500 KHz.
 - Input amplitude : 1Vp-p.
3. **Phase Lock Loop Detector:**
 - Operating frequency : Adjustable from 400 KHz to 500 KHz.
 - Input amplitude : 1Vp-p.
4. **Phase Detector And FM Quadrature Detector:**
 - Operating frequency : Adjustable from 400 KHz to 500 KHz.
 - Input amplitude : 1Vp-p.
5. **Detuned Resonance Detector:**
 - Operating frequency : Adjustable from 400 KHz to 500 KHz.
 - Input amplitude : 1Vp-p.
6. **De-Emphasis Circuit** : Time period of 50uS.
7. **Amplitude Limiter:**
 - Operating frequency : 455 KHz.
 - Input amplitude : from 0.5 to 5Vp-p.
 - Output limited amplitude : 1.5Vp-p.
8. **Low Pass Filter:**
 - 4TH Order Butterworth Filter.
 - Cut-Off Frequency : 3.4 KHz.
9. **Audio Output:**
 - Amplifier with speaker.
 - Audio Amplifier Gain : 20dB.

9.5 Noise PSD kit.

[01 No.]

Required Specifications

1. **Clock Generator:** Frequency 2MHz
2. **Onboard Signal:**
 - Sine Wave
 - Frequency : 1 to 10 KHz.
 - Amplitude : 0 to 2Vpp.
3. **Noise Generator:**
4. **Pseudo Random Noise Source:**
 - Number of Bits : 32 bit.
 - Output Amplitude : 0 to 1V.
 - Noise Bandwidth : 2 MHz.
5. **Signal Attenuation and Adder:**
 - Adjustable from 0 to the maximum of input value.
 - Signal + Noise Adder Stage.
6. **Low Pass Filter:**
 - 4th Order Butterworth Filter
 - Cut-off Frequency : 3.4 KHz.
7. **Power Meter and Display:**
 - Input signal Amplitude : 0 to 2Vpp.
 - Timer : 1 to 15 seconds.
 - Display : 2 Digit Seven Segment

FDM Transmitter /Receiver kit

[01 No.]

Required Specifications

1. **Carrier Generator:**
 - Sub carrier : 1 KHz to 20 KHz and 1 KHz to 30 KHz With adjustable amplitude of 0-2 Vp-p
 - Pilot carrier : 256 Khz
- 2 **Transmitter** : High frequency transmission using DSB
- 3 **Multiplexing** : Frequency Division Multiplexing
Channel : 02 Nos.
- 4 **Band Pass Filter**
 - Pass Band: Filter 1 & 3 frequency range 8 to 12 KHz with Carrier frequency 10 KHz
 - Filter 2 & 4 frequency range 18 to 22 KHz with carrier frequency 20 KHz
- 5 **AM-DSB MODULATOR/DEMULATOR:**
 - **Modulation** : Amplitude Modulation. Double Side Band.
 - **Receiver** : Amplitude Demodulation of DSB
 - **Demultiplexing** : Frequency Division Demultiplexing
 - **Low Pass Filter** : 4th Order Butterworth Filter

(10) Klystron Based Microwave Bench

[01 No.]

Required Specifications

1. Solid State Klystron Power Supply
2. Klystron Mount with Klystron tube 2K25 / 2K27
3. Gunn Power supply
4. Gunn Oscillator
5. Isolator
6. Frequency Meter (Direct Readout)
7. Variable Attenuator
8. Slotted Section
9. Tunable Probe
10. Detector Mount:
11. Movable Short
12. Matched Termination
13. Four Waveguide Stand
14. VSWR Meter
15. Fixed Attenuator: 3,6,10dB: 1each
16. Variable Attenuator: 20dB
17. Slid Screw Tuner
18. E – Plane Tee
19. H – Plane Tee
20. Magic Tee
21. SS Tuner
22. Multihole Directional Coupler: 3,10 dB: 1each
23. C.D. Coupler 20dB
24. Three Port Circulator (T/Y)
25. E – Plane Tee
26. H – Plane Tee
27. Magic Tee
28. SS Tuner
29. Three Port Circulator (T/Y)
30. E – Plane Bend, H – Plane Bend: 1each
- 31. Accessories:**
 - Cooling Fan
 - BNC to BNC Cable
 - TNC Cable

(11) Gunn Diode Based Microwave Bench

[01 No.]

Required Specifications

Vendor/ s Specifications

1. Gunn Power supply
2. Gunn Oscillator
3. Isolator
4. Frequency Meter (Direct Readout)
5. Variable Attenuator
6. Slotted Section
7. Tunable Probe
8. Detector Mount:
9. Movable Short
10. Matched Termination
11. Four Waveguide Stand
12. VSWR Meter
13. Fixed Attenuator: 3,6,10dB: 1each
14. Variable Attenuator: 20dB
15. Slid Screw Tuner
16. E – Plane Tee
17. H – Plane Tee
18. Magic Tee
19. SS Tuner
20. Multihole Directional Coupler: 3,10 dB: 1each
21. C.D. Coupler 20dB
22. Three Port Circulator (T/Y)
23. E – Plane Tee
24. H – Plane Tee
25. Magic Tee
26. SS Tuner
27. Three Port Circulator (T/Y)
28. E – Plane Bend, H – Plane Bend: 1each
- 29. Accessories:**
30. Cooling Fan
31. BNC to BNC Cable
32. TNC Cable

(B) DEPARTMENT OF MECHANICAL ENGINEERING

(1) Computer Based Single Cylinder Two Stroke Petrol Engine Test Rig [01 No.]

Required Specifications

The Test Rig Consists of the following:

(a) Engine: Single cylinder 4 stroke petrol engine of 100 CC capacity, New.
Make: Hero Honda Ltd.

(b) Dynamometer: The Eddy current dynamometer of suitable HP and Loading arrangement (electrical dynamometer)

Load Measurement :-With energy module: output:4:20 mA

(b) P-θ & P-V Plot:

i Piezo Sensor : 1 no. for combustion pressure.

ii Piezo Amplifier : 1 no.

iii Crank angle sensor with TDC marker : 1 no.

iv Temp. Transmitter : 6 nos. with sensors

- V ADC Card :1 no. with complete interfacing
- (c) Software : A powerful software for studying different characteristics of I.C. Engine e.g. brake power v/s speed & load heat converted to brake power, heat goes to exhaust gases & heat unaccounted.
- (d) Computer :- Core to duo or I3 Processor, keyboard, TFT Monitor, 2 GB RAM, 80 GB HDD, DVD-Writer.
- (e) Fuel Measuring Device: Fuel flow sensor for fuel metering. Fuel tank mounted on sturdy iron stand, burette tube, 3 – way cock connecting tube & a stop clock.
- (h) Calorimeter: Double pipe heat exchanger to measure the heat goes through exhaust gases.
- (f) Air Intake Measurement: Air intake reservoir of size 0.3m x 0.3m x 0.5m with orifice plate, U-Tube manometer of 0.3 m height for the measurement of air flow rate.
- (g) 12 Channel Digital Temperature Indicator: With set of thermocouples (six) along with 6 way temperature indicator selector switch.
- (h) Instruction manual : 1copy

(2) Diesel Smoke Meter

[01 No.]

Required Specifications

1. Measurement Range - absorption coefficient (K Value):-0-99.99 m⁻¹, Resolution:-0.01m⁻¹
2. Opacity :- 0-100%, Resolution- 0.1%
3. Principle:- Attenuation of Light beam
4. Light source;- Halogen Bulb,12 V DC/20 W
5. Colour Temperature;- 3050 K
6. Interface:-RS 232
7. Engine Speed(RPM)- Measurement-200 to9990 rpm, Resolution:- 1 rpm
8. Engine oil temperature:- Range -0 to 150°C, Resolution :-1°C
9. Linearity :- 0.1m⁻¹
10. Repeatability :- 0.1m⁻¹
11. Zero and Span Drift :- 0.1m⁻¹
12. Response Time – Physical : - <0.4 seconds
13. Response Time – Electrical :- < 1 milli second
14. Warm Time :- < 8 minutes
15. Power supply:- 12V DC, 220V AC ±10 % Single Phase, 50 HZ
16. Operating temperature:- 5°C to 50°C
17. Automatic pressure regulation
18. Pass/ Fail Indication and emission limit in printout
19. Smoke column temperature :- 70 to 100°C

Accessories-

- a) RPM sensor :- (6 mm 1 no.)
- b) Oil temperature sensor :- RTD, PT100
- c) Trolley
- d) Set of probes with synthetic rubber hose (5 m)
- e) Mains card
- f) Operating manual
- g) Battery cable
- h) Inbuilt printer ,
- i) RS 232 Cable
- j) Computerization software CD
- k) PC Keyboard
- l) LED Remote control

(3) Lathe Machine

[01 No.]

Required Specifications

Length of bed	70 mm
Width of bed	38 mm
Centre height	65 mm
Max swing in gap	53 mm
Max swing over bed	317 mm
Bore in spindle	40Φ
Lead screw	4 TPI
Electric motor	1 HP
Electric motor PH/RPM	3/1440
Electric motor Volts Amp.	415 V
Dol starter L&T model-MKI	Relay 1.5 to 2-5 A
Reversible switch	Vicco or equivalent
Reversible switch Volt/Amp/Ph	415/16/3
V belts (02 in no.)	B52
3-Jaw chuck-Self centered 8"	Harman or equivalent
Chuck Face plate	8"

(4) Ball Bearing Test Rig with accessories

[01 No.]

Required Specifications

- 1) Bearing Mounting Fixture – Consists of a set of bearing races for bearings from 6201 to 6206 with parallelogram loading attachment.
- 2) Drive motor- 1 HP, 2800 rpm A.C. motor.
- 3) Lever & spring balance for applying the load maximum loading capacity 10 kN.
- 4) Electronic revolutions counter with digital indicator.
- 5) Torque arm with dead weights for measurement of friction torque.
- 6) Fixture for measurement of radial clearance of bearing.

(5) High Temperature Grease Tester

[01 No.]

Required Specifications

Parameter	Unit	Min	Max	Remarks
Motor Speed	RPM		10,000	± 3 %
Temperature of bearing	°C Ambient		400	± 3 %
Thrust Load	N	24	67	± 2 %
Run Time	Hours	0	99999.9	
Power	V/Hz/A	220/50-60/15	Other	voltages on request

**(C) DEPARTMENT OF ELECTRONICS & INSTRUMENTATION
ENGG.**

(1) Universal Testing Machine

[01 No.]

Required Specifications

- i) Maximum Capacity: 1kN
- ii) Load resolution: 0.050 Kg
- iii) Accuracy in variables measured: 1% of true Value
- iv) Grip : Suitable attachments should provided to hold specimen size of 100mm length, 60mm wide and 10mm thick
- v) Extension display: 0.01 mm with 0.5% accuracy of travel
- vi) Live interfacing with the computer during the test

The machine should be vertically mounted and perform tests in tensile as well as compression loading arrangement. Accordingly suitable accessories for clamping/holding the specimen shall also be provided for both the tensile & compression loading case. Microprocessor based digital display load and extension. Compatibility with Computer using Windows 7 is required.

(2) Portable Multi-Logger 10 isolated channels

[01 No.]

Required Specifications

- i) Make: OMRON
- ii) Model_ZR-RX20A-E
- iii) Portable Multi-channel input (thermal resistance, voltage etc.)
- iv) Compatible with USB flash drive, Internal 3.5MB flash memory
- v) 3.5 inch TFT colour LCD
- vi) M3 screw terminal blocks
- vii) Records Temperature, Voltage, Humidity
- viii) Logic and Pulses
- ix) 16 Bit A/D resolution

Above equipment with associated accessories is required

(3) IBM ILOG CPLEX Optimizer

[01 No.]

Required Specifications

Software used for flexible, high-performance optimizers for solving linear programming, quadratic programming, quadratically constrained programming and mixed integer programming problems.

(4) UV-Visible Spectrophotometer**[01 No.]****Required Specifications**

- i) WAVE LENGTH : 195 TO 1000 nm
 - ii) SPECTRAL BANDWIDTH : 2 nm
 - iii) ACCURACY : ± 0.5 nm
 - iv) REPEATABILITY : ± 0.3 nm
 - v) RESOLUTION : 0.1 nm
 - vi) PHOTOMETRIC RANGE : %: 0 to 100%, Abs. 0 to 1.999 Conc : 0 to 1999, K- Factor : 0 to 1999
 - vii) ACCURACY : ± 0.005 Abs at 1.0 Abs
 - viii) READABILITY : ± 1 Count
 - ix) DATA READOUT : Single Line LCD display
 - x) KEY BOARD : 4 Keys Membrane Type
 - xi) LIGHT SOURCE : a) Tungsten Halogen Lamp
(b) Deuterium Lamp
 - xii) DETECTOR OPTICS : Wide range silicon photodiode Complete mirror optics with Resolution 1200 grooves/mm Gratin.
 - xiii) SAMPLE HOLDER : 4 Position adjustable sample holder
 - xiv) POWER : 230V $\pm 10\%$, 50 Hz. AC
 - xv) DIMENSIONS : 420 X 350 X 240 MM (l x b x h) App
 - xvi) Weight : 10 Kg. (Approx.)
- With Printer interface and Serial port interface.

(5) Water & Soil Analysis Kit**[01 No.]****Required Specifications**

- (a) TDS;
 - Range : 0 - 20 ppt
 - Resolution : 0.01 ppt
 - Accuracy : $\pm 0.5\%$ FS ± 1 Digit
 - Cell Constant : Pre Adjusted
- (b) pH;
 - i) Range : 0 to 14 pH
 - ii) Resolution : 0.01 pH
 - iii) Accuracy : 0.01 ± 1 Digit
 - iv) Temp. Comp. : 0 to 100°C (Manual)
- (c) DO;
 - i) Range : 0 - 20 ppm
 - ii) Resolution : 0.1 ppm
 - iii) Accuracy : 0.5 ppm ± 1 Digit
 - iv) Temp. Comp. : Manual (5°C to 55°C)
 DO Sensor : Gold / Silver Amperometric Probe
- (d) Salinity;
 - i) Range : 0 - 50 ppt
 - ii) Resolution : 0.1 ppt
 - iii) Accuracy : $\pm 0.5\%$ FS ± 1 Digit
- (e) Turbidity;
 - i) Range : 0 - 1000 NTU
 - ii) Resolution : 1 NTU
 - iii) Accuracy : $\pm 3\%$ FS ± 1 Digit
 - iv) Sample System. : 30mm Clear Glass Tube
 - v) Power : Supply 12V Rechargeable Battery And 230V $\pm 10\%$ AC, 50Hz
 - vi) Display : 3.5 Digit LCD
- (f) Conductivity (EC);
 - i) Range : 0 - 20 S

	<ul style="list-style-type: none"> ii) Resolution : 0.01S (10mS) iii) Accuracy : ± 0.5% FS ± 1 Digit iv) Cell Constant : Pre Adjusted v) Temp. Comp. : Adjustable from Table vi) Temp. : Coefficient 2% vii) Reference Temp. : 25°C <p>(g) Temperature;</p> <ul style="list-style-type: none"> i) Range : 0 - 100°C ii) Resolution : 0.1°C iii) Accuracy : ± 0.1°C ± 1 Digit iv) Sensor : Semi Conductor Type v) Display : 3 1/2 digit LCD vi) Power Supply : 12V Rechargeable Battery and 230V ± 10%AC, 50Hz 																																				
	<p>(6) Photo Colorimeter [01 No.]</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="background-color: #cccccc; text-align: center;">Required Specifications</th> </tr> </thead> <tbody> <tr> <td colspan="2">i) Resolution : 1% T, 0.01 Abs., 0.01 Conc., 0.01 K Factor</td> </tr> <tr> <td colspan="2">ii) K – Factor : 1 - 19999</td> </tr> <tr> <td colspan="2">iii)Filters : 400,420,480,500,520,540,620,680 nm% Transmission 0 -100%T</td> </tr> <tr> <td colspan="2">iv)Power : 230 V AC ± 10%, 50 Hz. With inbuilt Stabilizer Absorbance 0 - 1.99 A</td> </tr> <tr> <td colspan="2">v) Weight : 2.5 Kg. (App.)</td> </tr> </tbody> </table>	Required Specifications		i) Resolution : 1% T, 0.01 Abs., 0.01 Conc., 0.01 K Factor		ii) K – Factor : 1 - 19999		iii)Filters : 400,420,480,500,520,540,620,680 nm% Transmission 0 -100%T		iv)Power : 230 V AC ± 10%, 50 Hz. With inbuilt Stabilizer Absorbance 0 - 1.99 A		v) Weight : 2.5 Kg. (App.)																									
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<p>Item Sets 15/ Softcopy Record Room for Administrative Section</p>	<p>(1) RAID Server [01 No.]</p> <p>Server : IBM/Dell/HP with following configuration</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">Processor</td> <td>2U Rack Server with One Intel Xeon E5645 Six core processor 2.4 ghz , with option to upgrade to DUAL CPU in Future</td> </tr> <tr> <td>Chipset</td> <td>Intel 5520</td> </tr> <tr> <td>Cache Memory</td> <td>Level 3 Cache 12 MB</td> </tr> <tr> <td>FSB</td> <td>1333 MHz or higher</td> </tr> <tr> <td>Memory</td> <td>PC3-10600 DIMMs DDR3-1333 with ECC capabilities</td> </tr> <tr> <td></td> <td>16 GB installed, expandable to 192 GB</td> </tr> <tr> <td>Storage controller</td> <td>RAID Controller with Cache for Supporting RAID 0,1,5,10</td> </tr> <tr> <td>Internal Driver bays</td> <td>8 small form factor (SFF) hot-plug drive bays to support serial attached SCSI(SAS) drives - Epanable to 16 Drives in the same chassis</td> </tr> <tr> <td>Storage type</td> <td>Hot plug SFF SAS</td> </tr> <tr> <td>Hard Disks</td> <td>4 x 300 GB (10k rpm) SAS Hot Swap</td> </tr> <tr> <td>Optical drive</td> <td>DVD+R/RW 8X or higher</td> </tr> <tr> <td>I/O expansion Slots</td> <td>4 PCI Expansion Slots</td> </tr> <tr> <td>Network Controller</td> <td>Integrated dual port Multifunction Gigabit NICs (with Driver for all Linu versions)</td> </tr> <tr> <td>Graphics</td> <td>Integrated video standard</td> </tr> <tr> <td>Industry standard</td> <td>ACPI 2.0 complaint, PCI 2.2 Complaint, WOL support, Microsfot Logo certification, USB 2.0 support</td> </tr> <tr> <td>Power supply</td> <td>Redundant Hot plug power supply</td> </tr> <tr> <td>Syatem fans:</td> <td>Redundant Hot Swap FANS</td> </tr> <tr> <td>Form factor</td> <td>Rack/ 2U with sliding mounting rails and necessary accessories</td> </tr> </table>	Processor	2U Rack Server with One Intel Xeon E5645 Six core processor 2.4 ghz , with option to upgrade to DUAL CPU in Future	Chipset	Intel 5520	Cache Memory	Level 3 Cache 12 MB	FSB	1333 MHz or higher	Memory	PC3-10600 DIMMs DDR3-1333 with ECC capabilities		16 GB installed, expandable to 192 GB	Storage controller	RAID Controller with Cache for Supporting RAID 0,1,5,10	Internal Driver bays	8 small form factor (SFF) hot-plug drive bays to support serial attached SCSI(SAS) drives - Epanable to 16 Drives in the same chassis	Storage type	Hot plug SFF SAS	Hard Disks	4 x 300 GB (10k rpm) SAS Hot Swap	Optical drive	DVD+R/RW 8X or higher	I/O expansion Slots	4 PCI Expansion Slots	Network Controller	Integrated dual port Multifunction Gigabit NICs (with Driver for all Linu versions)	Graphics	Integrated video standard	Industry standard	ACPI 2.0 complaint, PCI 2.2 Complaint, WOL support, Microsfot Logo certification, USB 2.0 support	Power supply	Redundant Hot plug power supply	Syatem fans:	Redundant Hot Swap FANS	Form factor	Rack/ 2U with sliding mounting rails and necessary accessories
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Cables	All necessary power cables required for the servers
Operating System Certified	Windows 2008 / REDHAT Linux Enterprise 5 (quote separately for each os)
Mouse	Optical Mouse
Keyboard	Intel keyboard
Warranty	3 year onsite warranty

(2) High Speed Scanner

[01 No.]

Scanner type	Flatbed, ADF
Scan resolution, optical	Up to 2400 dpi
Bit depth	48-bit
Levels of grayscale	256
Multifeed detection	No
Automatic document feeder capacity	Standard, 50 sheets
Automatic document feeder speed	Up to 8 ppm/4 ipm (b&w)
Task speed	10 x 15 cm (4 x 6 in) color photo to Microsoft Word: less than 24 sec, to share/e-mail: less than 18 sec; OCR Letter/A4 text page to Microsoft Word: less than 36 sec
Scan size, maximum (flatbed)	8.5 x 11 in
Scan size, maximum (ADF)	8.5 x 14 in
Scan Size Minimum (ADF, imperial)	3.5 x 5 in
Media types	Paper (banner, inkjet, photo, plain), envelopes, labels, cards (greeting, index), 3-D objects, 35 mm slides and negatives (using transparent materials adapter), iron-on transfers
Media weights, recommended	16 to 24 lb
Scan file format	Windows: BMP, JPEG, GIF, TIFF, TIFF compressed, PNG, PCX, Flashpix (FPX), PDF, PDF searchable, RTF, HTM, TXT; Macintosh: TIFF, PICT, JPEG, GIF, FlashPix, Plain Text, PDF, HTML, Rich Text
Preview scan speed	Up to 10 sec
Button functions	5 front-panel buttons (Copy, E-mail, File document, Scan document, Scan photo)
Operating temperature range	41 to 104° F
Operating humidity	0 to 90% RH
Storage humidity	0 to 90% RH

Connectivity, standard	1 Hi-Speed USB 2.0
Minimum system requirements	PC: Microsoft® Windows® 7 ready (for more information go to www.hp.com/go/windows7 . Some features may not be available), Windows Vista®: 1.3 GHz processor, 1 GB RAM (2 GB for 64-bit); Windows® XP: 1.3 GHz processor, 512 MB RAM (1 GB for 64-bit); Windows® 2000: 800 MHz processor, 256 MB RAM, for all systems: 450 MB available hard disk space (additional 500 MB

	<p>and Hi-Speed USB 2.0 port recommended for extensive ADF use), CD-ROM drive, 800 x 600 SVGA monitor, 16-bit color</p> <p>Macintosh: Mac OS X v10.2, 10.3, 10.4: PowerPC G3, G4, G5, or Intel Core processor, 128 MB RAM, 240 MB available hard disk space; Mac OS X v10.5: PowerPC G4, G5, or Intel Core processor, 512 MB RAM, 7 GB available hard disk space; Mac OS X v10.6 (available on HP.com): Intel Core processor, 1 GB RAM, 25 MB available hard disk space</p>
Twain version	Version 1.9
Compatible Operating Systems	Microsoft® Windows® 7 ready. For more information go to http://www.hp.com/go/Windows7 . Some features may not be available. Windows Vista®, Windows® XP, Windows® XP x64, Windows® 2000, Mac OS X v10.3.9, 10.4.11, 10.5, 10.6
Macintosh compatible	Yes
Power consumption	36 watts maximum
ENERGY STAR® Qualified	Yes
Item Sets 16, 17, 18, 19, 20 and 21 / Information Technology Centre	Item Set 16: Comprehensive AMC for Campus Wide Network & Facility Management Services.
	Item Set 17: Antivirus Software Enterprise Version (Trend Micro, Norton, Quickheal)
	Item Set 18: Core Switch of Cisco/HP/Juniper/Dlink make
	Item Set 19: Edge Switch of Cisco/HP/Juniper/Dlink make
	Item Set 20: Linux Operating System Enterprise Version
	Item Set 21: Comprehensive AMC for Wireless Network in University Hostels
	Item Set 22: Wi-Fi Campus Network
Refer APPENDIX B1 for the details and additional instruction about the Item Set 16, 17, 18, 19, 20, 21 and 22 for Information Technology Centre.	

APPNEDIX A1

Sealed tenders separately for each item set category (Item sets are numbered from 1 to 15) are invited for supply of the above mentioned articles/equipments/services, so as to reach the Information Technology Centre on or before 4 PM on **Jan 25, 2012**

Tender document can also be downloaded from University web site www.dauniv.ac.in and **non refundable** draft of Rs.1000 in favor of Head, Information Technology Center be attached with the downloaded submitted form in inner envelope number 1 .

General Terms and Conditions applicable for all items and Desktop Computers and servers:

- 1 Rates quoted should be inclusive of all taxes and other charges for delivery and installation F.O.R. DAVV, Indore.
- 2 The items for which DGS & D rates are available, if those items are quoted higher than the DGS & D rates, will not be considered. The items for which DGS & D rates are available, the supplier should also mention the DGS&D rate contract rates for the closets configuration offered in order to compare.
- 3 Rates quoted should be valid up to placement of order. Specified quantity can be reduced or increased by 50%. [Refer Section 4 also.]
- 4 Delivery of the items should be done on or before March 13, 2012. Rate should be valid up to March 31, 2012, as further purchase can be done by other University Teaching Departments and Offices. The technical deviation from the DGS&D rate contract available configuration should be submitted in Form 2 in separate sealed envelope. Quotations should also mention the maintenance warranty period. The Maintenance warranty should be for comprehensive and the period of warranty will be counted from 1 month after satisfactory installation and acceptance by technical committee of experts. The services for maintenance should be from the Indore based Service centre setup of the Company. Quotations should also mention the Service centre address and contact.
- 5 Technical bid envelope for software must have the details of features or additional features of the product, language used and sample screen shots. Technical committee of experts reserves the right to seek presentation or explanation of the features mentioned and right to accept the technical specifications offered. There should have perpetually auto renewable license wherever company has provision for it (Wherever applicable). The license conditions should also be clearly specified in the technical bid.
- 6 Vendors are requested to provide:
 - A. Proof of total years of their existence in the business
 - B. Annual turnover of organization
 - C. PAN Number proof
- 7 No overwriting be done on the rates and units. The rates shall always be quoted in both figures and words and correction (if any) must be signed by the vendor.

- 8 Vendors are requested to read specifications carefully and submit quotations as per the specifications given. Deviation, if any, must be clearly stated.
- 9 All the pages of quotation must have seal, name & signature of the authorized person.
- 10 The complete detailed specifications along with accessories, if any, be clearly mentioned in the quotation giving the guarantee/ warrantee period. Facilities for service and maintenance should also be indicated. Detailed technical information, Brochures, leaflets, and drawing which ever is applicable must be furnished along with tender(s).
- 11 The vendor should enclose the certificate of authorization for dealership or being OEM.
- 12 In case of imported goods, the university may try to provide duty exemption certificate wherever applicable.
- 13 No claim for any tax or duty, not stipulated in the tender will be admitted at any stage.
- 14 Vendor will furnish the list of addresses (if any), where similar equipment has been supplied or work has been carried out in the past.
- 15 University reserves the right to invite on its own the bids directly from Internationally recognized top listed companies or manufacturers and select the reputed brands as suggested by its technical committee/experts.
- 16 We do not intend to call vendors for financial negotiations. Vendor should, therefore, quote their lowest possible rates (Clearly mentioning the discount for educational institute, if any). However, technical discussion may be held, if felt necessary by the technical committee.

17 **The Agencies are required to submit the sealed tenders in the following manner.**

There will be a separate set of three envelopes for each item, all these sets should be sealed. These envelopes should be kept in outer envelope which should also be sealed. This outer envelope, containing three sealed envelopes should be super-scribed with “Advt. Ref. No. and Item Set No./Deptt” on each inner and outer envelope.

(i) **Envelope 1 (Tender Document & Processing Fee):** Superscribed as “Tender Document & Processing Fee” and “Item Set No...”. The downloaded filled tender document along with processing fee of Rs. 1000/- by D.D. in favor of Head, Information Technology Centre, DAVV payable at Indore

(ii) **Envelope 2 (Technical Details)** Superscribed as “Technical Bid” and “Item Set No...” . Technical Specifications for each set of items. Should also contain a certificate that the items are as per the specifications asked in the tender, else any deviation from that must be clearly mentioned in the technical bid envelope containing technical specifications.

(iii)**Envelope 3 (Financial Bid)** Superscribed and Item Set No. as “Financial Bid” and “Item Set No...” . Financial Bid along with EMD of 3% of the bid for the goods costing more than Rs. 1,00,000/- (One lac) by D.D. in favor of Head, Information Technology Centre, DAVV payable at Indore

Note: Any correction/overwriting should be attested by the person signing the documents, failing which the tender will be rejected without any notice. Use of correcting fluid in the price schedule is strictly prohibited. All the pages must have seal, name and signature of the authorized person.

- 18 Tender may be accepted in part or in full or may summarily be rejected without assigning any reason.
- 19 Delivery period must be mentioned against each item. After the order has been placed the goods must be delivered within the stipulated period..
- 20 Ordinarily, the payment is made after the goods have been received and inspected at destination. In case the goods are rejected these have to be removed by the vendor at his own cost. The rejected goods must be replaced by the vendor within 15 days of dispatch of registered notice intimating that the goods have been rejected, failing which the order may be cancelled.
- 21 In case, university desires to inspect the goods at manufacturer's premise, the vendor shall provide all the facilities/ expenses to the officer deputed for this purpose.
- 22 Unless otherwise stipulated the tender should be valid for at least 180 days from the due date of opening of the tender.
- 23 All disputes shall be subject to Indore Jurisdiction.
- 24 **Without EMD (for the outstations for the items quoted costing more than Rs. 1,00,000), the tender shall be considered as invalid. No EMD is required from Government or Public sector undertaking.**
- 25 **Income & Commercial tax will be deducted at source wherever applicable.**
- 26 Sealed tender can be sent either by EMS Speed post or by hand on or before 4 P.M. **Jan 25, 2012**
- 27 **TENDER RECEIVED AFTER DUE DATE WILL NOT BE CONSIDERED.**
- 28 Instruction manuals containing instructions for installation, operations, part list and instructions for trouble shooting must be supplied and included in the cost of the equipment.
- 29 The numbers of items are only approximate quantity required; DAVV reserves the right to change it as per the requirement.

The vendor is requested to read all terms and conditions carefully before submitting the tender. Clarification (if any) may be sought out during office hours from Information Technology Center, DAVV before submitting the tender.

For Registrar

Instructions

- Last date of submission: By EMS Speed post or by hand in the office on or before 16.00Hrs. **Jan 25, 2012**
- Outer Envelope and technical bid will be opened on **Jan 27, 2012** at 16.00 Hrs. in the office of Finance controller .
- Financial bid will be opened only for Successful Tenderers, who will be selected on the basis of technical committee report. The date will be notified on website. Vendors can send representative on that date
- The Agencies are expected to examine this tender document in detail, while preparing their technical and financial proposal. Material deficiencies in providing the information may result in rejection of the proposal.
- At any time before the submission of the proposal, University may, for any reason, whether on its own initiative or in response to a clarification requested by a prospective tenderer, modify the tender document by an amendment. The amendment will be notified/informed in writing through addenda and sent by e-mail, post etc. to all tenderers who have received the tender document and will be binding on them. In order to provide reasonable time, in which to take the amendment into account in preparing their tenders, University may at its discretion extend the deadline for submission of the proposals.
- Proposals received after due date will be summarily rejected. University, however, at its discretion may extend the date of submission in which case it shall inform about the date extension or any such amendment to the Tender Document to the parties who have taken the tender document, by an e-mail. In addition, the change would be displayed on the University Website. University shall not be responsible for any delay in postal services. The Technical and Financial proposal shall be the basis for contract finalization and ultimately contract will be signed with the selected Tenderer as decided by University.
- University shall consider only those agencies which are cleared by the technical committee. As a part of evaluation process University may invite short-listed parties for making presentation to the technical committee, if that is considered necessary. Similarly, where ever required the technical committee may visit vendor/customer locations. The date and time for such presentation/inspection shall be decided by University and informed to the concerned parties. Thus technical evaluation will be based on the evaluation of technical proposal and an independent assessment of technical committee on the basis of on site visit, information available in public domain and client feed back.
- The Technical specifications may be fine tuned if necessary and modification (if any) in technical specification shall be notified on university website(www.dauniv.ac.in).
- The tenderers are required to submit the required details strictly in the specified format, failing which; their tender is likely to be rejected.

General Information about the tenderer
(To be Kept in the second envelope)

Sno.	Particulars	Details
1	Name and Address of the Tenderer	
2	Name and Mobile number of the contact person	
4	Office Telephones	
5	Fax Number	
6	e-mail address	
7	Name of the Chief Executive and Telephone No	
8	Name(s), contact number and address(s) of proprietor or Directors.	
9	Sales Tax / Commercial Tax CST Nos.	
10	Income Tax PAN / GIR No	
11	Annual Turnover for the Last 3 Years : 2008-09 2009-10 2010-11	
12	List of Major Clients and Size of Orders executed	

Signature Of Tenderer
With Stamp & Seal

(To be kept in the second envelope: Technical Bid)

Form 1

Specifications:

To be kept in the envelope superscribed with “Technical Bid” “Item Set No...”

We are ready to supply the following Items with features as mentioned below:

S/N	Parameter	Description	Compliance	Any Deviations?

Signature _____

Date:

Name _____

In capacity of _____

Name of the organization & seal

[To be kept in the second envelope]

Form 2

TECHNICAL DEVIATIONS

Following are technical deviations and variations from the tender document, these deviations and variations are exhaustive. Except these deviations and variations, the entire work shall be executed as per tender document specifications.

Sr. No.	Clause No.	Page No.	Statement of Deviations and Variations

Date

(Name & Signature)

Place

(In the capacity of:

Duly authorized to sign Tender for and on behalf of

.....

Name of the organization & seal

(To be kept in the second envelope: Technical Bid)
Form 3

1. Name of Organization :

2. Address :
.....
.....

3. Details of Bank Draft, in favour of Head Information Technology Centre, payable at Indore.

i) EMD:

a. Name of Bank & Branch: _____

b. Draft no. and date: _____

ii) Tender form price (In case downloaded from the website): Rs. 1000/-

a. Name of Bank & Branch: _____

b . Draft no. and date: _____

4. Contact person name and phone number :- _____

Signature:.....

Name:

Date:

Seal:

(To be kept in the third envelope: Financial Bid)

Form 4

Specifications:

Format For Financial Bid to be kept in the envelope superscribed with “Financial Bid” and “Item Set No...”

Financial Bid

The Financial Bid may be submitted in the following Format. (Cost for each item may be mentioned separately).

S/N	Product Code	Description	Qty	Unit Price	Applicable Taxes	Total Price
1						

Signature _____

Date:

Name _____

In capacity of _____

Name of the organization & seal

(To be kept in the first envelope)
Tender Form
Form 5

1. Name of Organization :

2. Address :
.....
.....

3. Items Set Number/ Department (Quoted for):

4. Details of Bank Draft, in favour of Head Information Technology Centre, payable at Indore.

ii) Tender form price : Rs. 1000/-

a. Name of Bank & Branch: _____

b . Draft no. and date: _____

5. Contact person name and phone number :- _____

Signature:.....

Name:

Date:

Seal:

ITEM SET 16

Comprehensive AMC for Campus Wide Network & Facility Management Services.

General Conditions of Contract (GCC) (Documentary evidence of all the claims must be submitted)

1. Minimum Eligibility for tenderers:

- **Turnover:** Minimum Rupees 100 Crores per annum for last three years, out of which Rupees 5 Crore per annum from AMC & FM services and must have executed at least one AMC of minimum value of Rs. 10 (Ten) lakhs per year.
 - **Experience:** Minimum three years experience of maintaining Campus Wide Network of size, services & platform similar to DAVV network (Refer Annexure A, B, C for more details) in Madhya Pradesh.
 - **Local Manpower Availability:** Vendor should have at least 20 engineers at Indore
2. The tenderer should have their local office in Indore for last 5 years.
 3. The tenderer should be ISO 9001 Certified.
 4. The tenderer has to mention ESI no. and PF account no. which is mandatory for the execution of the contract.
 5. The tenderer cannot transfer awarded contract into subcontract.
 6. The tenderer should provide 4(four) onsite resident engineers. The engineers should be CCNA and RHCE certified. One engineer will be responsible for server room activities and the other three engineers will be responsible for desktop support in the departments in different campuses.
 7. The tenderer should submit certified original copy of satisfactory performance of the quoted AMC and FM service work. Giving the details about the location, network services and network equipments.
 8. The individual signing the Tender Document and other documents on behalf of the tenderer should submit proof in support of his /her authority.
 9. University may modify the Scope of work in the best interest of the project if the necessity arises as and when the project is reviewed. Any change or modification in the scope of work or the content will be intimated in writing to the executing tenderer.
 10. The successful tenderer shall provide the services and carry out its other obligations under the agreement with due diligence, efficiency and economy. It shall apply appropriate advanced technology and safe and effective methods during execution of this contract.
 8. The EMD shall stand forfeited if the successful tenderer, whose tender is accepted, fails or refuses to furnish the security deposit amount within a fortnight from the date of acceptance of his offer, fails or refuses to execute the contract. No interest would be payable for any period on EMD. The amount of EMD will be refunded only after finalisation of tenders, and on receipt of written request from the unsuccessful tenderers. The EMD in case of successful tenderer may be adjusted against security deposit. It will be refunded only after the receipt of the Prescribed Security Deposit.
 9. Termination for Default:
In course of two months trial maintenance, University, without prejudice to any other remedy for breach of contract, by written notice of default sent to the tenderer terminate the contract in whole or in part there of, and amount of performance security deposit shall stand forfeited.
 10. Performance Security:

- The selected tenderer shall furnish performance security for an amount equal to 20% of the contract value within a fortnight's time after receipt of communication of formal letter of acceptance of his offer, or work order.
- The proceeds of the performance security shall be payable to the university as compensation for any loss resulting from the contract failure to complete its obligations under the contract.
- The performance security may be paid in the form of a bank guaranty issued by a scheduled bank and in the form provided in the tender documents.
- The performance security bond will be discharged after completion of the contractor performance obligations under the contract.

11. Payment Terms:

Payment will be made on quarterly basis, after deduction of the penalty amount if any. The payment will be made to the contractor by the way of account payee cheque after necessary deduction of income tax, commercial tax and any other taxes as applicable at that time from source for which the pre received invoice in duplicate will be required to submit by the contractor.

12. All disputes shall be subject to Indore jurisdiction.

SPECIAL CONDITIONS OF THE CONTRACT

- Initially the successful tenderer shall be required to maintain the network for two month on trial basis. On the basis of successful completion of the trial period, certified by the Head, IT Centre, the contract will be awarded, initially for one year, which can be extended further for two more years on the basis of annual reviews. During the trial period, if performance is not satisfactory and the tenderer fails to perform, then next lowest tenderer will be invited for the trial offer. In case of failure no payment will be made for trial period. However, in case of successful trial, payment will be made for trial period also.
- The renewal of the contract after every year will depend on performance of the agency. In case the performance is not found satisfactory the contract will be terminated.
- All hardware and relevant Networking software necessary for proper functioning of the campus wide network shall be covered under the contract.
- In case of failure of networking services the fault should be repaired within stipulated time, failing which a penalty will be imposed. Refer Annexure “D” for penalty provisions.
- The maintenance service consists of preventive and corrective maintenance of equipment and will include replacement of parts.
- The tenderer is required to test the virus-infected machines and remove the virus accordingly.
- The tenderer is required to maintain each machine on the network. Any problem related to the user machine must be resolved within 24 hour.
- The tenderer is required to maintain daily activity record.
- The tenderer is required to perform weekly analysis of network health and must provide report accordingly. Required analysis tools will be managed by tenderer only.
- The tenderer is required to perform network audit twice in a month.
- The contractor shall provide Preventive Maintenance (including but not limited to inspection testing, satisfactory execution of all diagnostics, cleaning and removal of dust and dirt from the interior and exterior of the equipment, and necessary repair of the equipment), once every 30 days, preferably during the first week of every month. This also includes cleaning of fibre termination points.
- The bank guaranty for security deposit amounting to 20% of one year's AMC charges will have to be deposited by the contractor before commencement of AMC and it shall be renewed every year, in advance.
- The B.G. shall be released after the expiry of the AMC period.
- At any time during the contract period any type of computer, network device can be added or deducted from the contract, proportionate payment/deduction will be made in such cases.
- During trial period tenderer has to migrate or Reinstall existing Network services.

ITEM SET 16

Comprehensive AMC for Campus Wide Network & Facility Management Services.

General Information about the tenderer

(To be Kept in the first envelope)

Sno.	Particulars	Details
1	Name and Address of the Tenderer	
2	Name and Mobile number of the contact person	
4	Office Telephones	
5	Fax Number	
6	e-mail address	
7	Name of the Chief Executive and Telephone No	
8	Name(s), contact number and address(s) of proprietor or Directors.	
9	Sales Tax / Commercial Tax CST Nos.	
10	Income Tax PAN / GIR No	
11	Annual Turnover for the Last 3 Years : <p style="text-align: right;">2008-09</p> <p style="text-align: right;">2009-10</p> <p style="text-align: right;">2010-11</p>	
12	List of Major Clients and Size of Orders executed	

Signature Of Tenderer
With Stamp & Seal

ITEM SET 16

Comprehensive AMC for Campus Wide Network & Facility Management Services.

Form 1

[To be kept in the first envelope]

Tenderer/Firm's Name

[Indore :]

To:

The Registrar
DAVV, Indore.

Dear Sir,

We, the undersigned, have examined the Tender Document, hereby offer to provide maintenance and services in accordance with the same. We are hereby submitting our Proposal, which includes this Pre-Qualification Information, Technical proposal and Commercial proposal.

We have enclosed the Earnest Money Deposit in the form of Bank Draft, as mentioned in the tender document.

All the rates quoted in our proposal are in accordance with the terms as specified in tender documents. All the prices and other terms and conditions of this proposal are valid for a period of 180 calendar days from the last date of submission of tenders.

We do hereby confirm that our prices include all taxes including Sales tax/VAT and service tax. We have studied the clauses relating to Indian Taxes and hereby declare that if any Tax, Surcharge on Tax and any other Corporate Tax altered under the law, we shall pay the same.

We declare that all the services shall be performed strictly in accordance with the technical specifications and other tender conditions except the deviations as mentioned in the technical deviation proforma. We further declare that the rates stated in our proposal are in accordance with your terms and conditions in the tender document, except the deviations as mentioned in the commercial deviation proforma.

Our proposal is binding upon us and subject to the modifications resulting from the Contract negotiations. Until a formal contract is prepared and executed, this bid together with your written acceptance thereof and your notification of award shall constitute a binding Contract between us.

We understand that you are not bound to accept any/ all Proposal(s) you receive.

We remain,

Yours sincerely,

Authorized Signature:

Name and Title of Signatory:

Name & Address of Agency/Firm:.....

ITEM SET 16

Comprehensive AMC for Campus Wide Network & Facility Management Services.

Form 2

[To be kept in the first envelope]

Pre-Qualification Information Sheet

1. Name of Agency/ Firm :
2. Organization Type :
3. Address :
.....
.....
4. Agency's experience (in years) related to the scope of work:.....
5. Last three years, year wise total turnover:(also attach the proof giving details)
6. Last three years turnover from AMC and FM services only, excluding hardware sale (Give Year wise figures) :(attach the proof giving details)
7. Details of Bank Draft, in favour of Head IT Centre, payable at Indore.
 1. EMD: Rs.
 - a. Name of Bank & Branch:
 - b. Draft no. and date:
 2. Tender form price (In case downloaded from the website): Rs. 1000/-
 - a. Name of Bank & Branch:
 - b. Draft no. and date:
8. List of top Five customers (AMC and FM services only), along with their addresses, nature of contract, annual contract value, contact persons and their phone numbers:

.....
9. Details of certifications (if any) related to services:

Signature:
Name:
Date:

Seal:

ITEM SET 16

Comprehensive AMC for Campus Wide Network & Facility Management Services.

Form 3

[To be kept in the first envelope]

Technical Competence and work experience

Give details of customers in the following format, having campus network of similar type (Linux based services etc.) and dimension (Approx. 1000 nodes). Refer Annexure A,B & C for the details of University Network.

Sl.No	Particulars	Details
1	Name of the Client	
3	Address	
4	Nature of contract & Description of Actual Services Provided	
5	Annual Contract Value	
6.	Starting Date & total period	
7	Number & Name of the Senior Staff involved and Functions performed	
8	Project Implemented at -(University/ Private /Govt)	

Authorized Signature:

Name and Title of Signatory:

Name & Address of Agency/Firm:.....

Organization's Seal:

ITEM SET 16

Comprehensive AMC for Campus Wide Network & Facility Management Services.

Form 4

[To be kept in the first envelope]

A. Duly authenticated list of full time engineers / Network professionals currently posted in the Indore region.(Minimum 20)

Sr. no.	Name	Designation	Edu. Qualification	Professional Certifications	specialization	Date of Joining the organization	Total Experience

B. Duly authenticated list of senior engineers / Network professionals located at other sites.(Minimum 10)

Sr. no.	Name	Designation	Edu. Qualification	Professional Certifications	specialization	Date of Joining the organization	Total Experience

Date

(Name & Signature)

Place

(in the capacity of:

Duly authorized to sign Tender for and on behalf of

.....

Organization's Seal:

ITEM SET 16

Comprehensive AMC for Campus Wide Network & Facility Management Services.

Form 5

[To be kept in the first envelope]

TECHNICAL DEVIATIONS

Following are technical deviations and variations from the tender document, these deviations and variations are exhaustive. Except these deviations and variations, the entire work shall be executed as per tender document specifications.

Sr. No.	Clause No.	Page No.	Statement of Deviations and Variations

Date

(Name & Signature)

Place

(In the capacity of:

Duly authorized to sign Tender for and on behalf of

.....

Name of the organization & seal

ITEM SET 16

Comprehensive AMC for Campus Wide Network & Facility Management Services.

Form 6

[To be kept in the third envelope]

Financial Bid

Having examined the conditions of the tender and specifications, including all the annexures, the receipt of which is hereby duly acknowledged, we the undersigned, offer to provide comprehensive AMC of campus wide network & associated services in conformity with the said conditions of tender.

Our bid for :(For one year, valid for three years)

SNo.	Details	Amount(Rs.)	Remarks
1.	Charges for comprehensive AMC of H/W as specified in annexure –B:		
2.	Charges for associated services mentioned in annexure –C.		
3.	Details of taxes, other charges and discounts (if any).		

1. We undertake, if our tender is accepted, AMC will commence within 2 weeks, from the date of issue of your work order.
2. Tender submitted by us is properly wax sealed and prepared so as to prevent any subsequent alteration and replacement. All the tender documents, duly signed are enclosed herewith.
3. Until a formal work order of contract is prepared and executed this tender together with your written acceptance thereof, in your notification of award, shall constitute a binding contract between us.
4. If our tender is accepted, we will obtain the guarantee of a scheduled bank for a sum amounting to 20% of the contract sum for the due performance of contract
5. We understand that you are not bound to accept the lowest or any tender, you may receive.

Name of the organization & seal

Signature _____
Name _____
In capacity of _____
Date:

Duly authorised to sign the tender for and on behalf of _____

ITEM SET 16

Comprehensive AMC for Campus Wide Network & Facility Management Services.

Scope of Work and technical Specifications

Refer Annexure A, B, C and D for details of existing network, list of equipments and services to be offered.

ITEM SET 17

Antivirus Software Enterprise Version[Trend Micro, Norton, Quickheal make]

(To be kept in the first envelope: Technical Bid)

Form 1

(A). Minimum Eligibility:

1. Vendor should produce authorization letter from the manufacturer.
2. Minimum three years of experience of maintaining enterprise Antivirus solution having minimum 500 users.

(B). Scope of work:

1. Installation and maintenance of the software on three servers: IT Centre, IET & Nalanda campuses.
2. Installation and configuration of clients PCs at various locations.
3. Training of users and IT centre staff for installation, configuration and maintenance of the software.
4. During license period, tenderer’s engineer is required to visit monthly and submit performance analysis report and suggest corrective measures.
5. Problems reported must be solved within twenty four hours.

(C). Specifications:

To be kept in the envelope superscribed with “Technical Bid –

We are ready to supply the following Items with features as mentioned below :

S/N	Description	Any Deviations ? Yes / No	Deviation Details
A	Capabilities		
1	Solution should able to Detect and block malicious software in real time, including viruses, worms, Trojan horses, spyware, Adware, and RootKit.		
2	Endpoint solution technology should include a behavioral based technology apart from providing the signatures for known threats, vulnerability add heuristic based approach. It should be able to score both good and bad behaviors of unknown applications, enhancing detection and reducing false positives without the need to create rule-based configurations to provide protection from unseen threats i.e. zero-day threats.		
3	Solution should provide application analysis, process control, file and registry access control, module and DLL control.		
4	Proposed IPS solution should have HIPS (host) to proactively protect against all variants, Should have behavior based technology.		
5	Proposed solution should be able provide superior root kit detection and removal. This should have access below the operating system to allow thorough analysis and repair.		
6	Denial of service detection and protection - Should Protect the system from multiple forms of anomalous network behavior that is designed to disrupt system availability and/or stability.		
7	Anti-spoofing - Should Protect the transmission of data from being sent to a hacker system who has spoofed their IP or Mac Address		
8	Agent has the ability to detect and block process execution chains. It is able to detect when a malicious application tries to execute a trusted application, and then use the trust privileges of that application to access		

	the network.		
9	Anti-application hijacking - Should prevent hackers and web sites from identifying the operating system and browser of individual computers.		
10	Code insertion attack prevention - Prevent malicious applications from inserting code into trusted application to bypass outbound application fire walling.		
11	Protocol adapter attack prevention - Prevent malicious applications from using their own protocol adapter to bypass outbound fire walling.		
12	Antivirus and Antispyware policy can have options by default to choose High Security and High performance to have a right balance while deployment in the production network.		
13	Antivirus should have behavior based technology to scan for Trojans, worms and key stroke loggers to protect from zero day threats. Sensitivity level of this should get adjusted with customized scanning frequency.		
14	Antivirus solution should be able to Scan POP 3 email traffic including email clients Microsoft outlook , lotus notes and outlook express.		
15	Desktop Firewall rules should be configurable depending upon the state of screen saver "ON" & "Off".		
16	Desktop Firewall Policies should be configurable depending upon the time and day.		
17	The solution must have readymade policies including –		
	a) To Make all removable drives read only ,		
	b) To block program from running from removable drives ,		
	c) Protect clients files and registry keys ,		
	d) Block modifications to host files		
18	Solution must be able to display and customize warning messages on infected computers. For example, if users have a spyware program installed on their computers, you can notify them that they have violated your corporate policy.		
19	Solution must provide a group updater for remote site and must have bandwidth throttling option to streamline updates and there by reducing load on the bandwidth		
20	To conserve the network bandwidth clients should be configurable to upload the maximum records of logs to the management server.		
21	Solution must be able to display and customize warning messages on infected computers. For example, if users have a spyware program installed on their computers, you can notify them that they have violated your corporate policy.		
22	Solution must provide a group updater for remote site and must have bandwidth throttling option to streamline updates and there by reducing load on the bandwidth		

B	Antivirus Protection and Other features		
1	Must offer comprehensive client/server security by protecting enterprise networks from viruses, Trojans, worms, hackers, and network viruses, plus spyware and mixed threat attacks.		
2	Must be able to reduce the risk of virus/malware entering the network by blocking files with real-time compressed executable files.		
3	To address the threats and nuisances posed by Trojans, the solution should be able to do the following:		
3.1	Terminating all known virus processes and threads in memory		
3.2	Repairing the registry		
3.3	Deleting any drop files created by viruses		
3.4	Restoring all files damaged by viruses		
3.6	Includes Cleanup for Spyware, Adware etc		

4	Must be capable of cleaning viruses/malware even without the availability of virus cleanup components. Using a detected file as basis, it should be able to determine if the detected file has a corresponding process/service in memory and a registry entry, and then remove them altogether		
5	Must provide Outbreak Prevention to limit/deny access to specific shared folders, block ports, and deny write access to specified files and folders on selected clients in case there is an outbreak		
6	Behavior Monitoring		
6.1	Must have behavior monitoring to restrict system behavior, keeping security-related processes always up and running		
6.2	Enable Certified Safe Software Service to reduce the likelihood of false positive detections		
7	Must provide Real-time lock down of client configuration – allow or prevent users from changing settings or unloading/uninstalling the software		
8	Users with the scheduled scan privileges can postpone, skip, and stop Scheduled Scan.		
9	CPU usage performance control during scanning		
9.1	Checks the CPU usage level configured on the OfficeScan Web console and the actual CPU consumption on the computer		
9.2	Adjusts the scanning speed if:		
9.2a	The CPU usage level is Medium or Low		
9.2b	Actual CPU consumption exceeds a certain threshold		
10	Should have a manual outbreak prevention feature that allows administrators to configure port blocking, block shared folder, and deny writes to files and folders manually		
11	Should have Integrated spyware protection and cleanup		
12	Should have the capability to assign a client the privilege to act as a update agent for rest of the agents in the network		
13	Shall be able to perform different scan Actions based on the virus type (Trojan/ Worm, Joke, Hoax, Virus, other)		
14	Safeguards endpoint mail boxes by scanning incoming POP3 email and Outlook folders for Threats		
15	Shall be able to scan only those file types which are potential virus carriers (based on true file type)		
16	Should be able to detect files packed using real-time compression algorithms as executable files.		
17	Shall be able to scan Object Linking and Embedding (OLE) File		
C.	Cloud Computing		
18	Must Have in the cloud based protection		
18.1	Must provide Web threat protection by the following ways:		
18.1a	Must be able to protect the endpoints from Web threats by blocking access to and from malicious sites based on the URL's reputation ratings		
18.1b	Must extend Web threat protection to the endpoints even when they disconnect from the network, i.e. regardless of the location		
18.1c	Must have the capabilities to define Approved URLs to bypass Web Reputation policies		

18.1d	Must provide real-time protection by referencing online database with millions of rated Web domains		
18.1e	Configure Web reputation policies and assign them to individual, several, or all clients.		
18.2	Must provide File reputation service		
18.2a	Must be able to check the reputation of the files hosted in the internet		
18.2b	Must be able to check the reputation of the files in web mail attachments		
18.2c	Must be able to check the reputation of files residing in the computer		
19	Must protect clients and servers on the network using stateful inspection, high performance network virus scanning, and elimination.		
20	Must provide the flexibility to create firewall rules to filter connections by IP address, port number, or protocol, and then apply the rules to different groups of users		
21	Must have smart feedback to enable feedback from the client agents to the threat research centers of the vendor. This will enable it to deliver automatic, real-time protection against the latest threats and provides "better together" security.		
22	Uses any alternate method other than the conventional pattern based scanning with the following features:		
22.1	Provides fast, real-time security status lookup capabilities in the cloud		
22.2	Reduces the overall time it takes to deliver protection against emerging threats		
22.3	Reduces network bandwidth consumed during pattern updates. The bulk of pattern definition updates only need to be delivered to the cloud or some kind of repository and not to many endpoints		
22.4	Lowers kernel memory consumption on endpoints. Consumption increases minimally over time.		
23	Should have granular device control with the following control actions		
23.1	Read only		
23.2	Read and write		
23.3	Read, write and execute		
23.4	Disable		
D.	Manageability and integration		
24	Must provide Comprehensive Support for Cisco Network Admission Control (CISCO NAC 1 & 2) with HCAP support		
24.1	Must provide seamless integration of the Cisco™ Trust Agent, enabling effective policy enforcement within a Cisco Self-Defending Network		
24.2	Must include a Policy Server for automated communication with Cisco Access Control Servers		
25	Should be able to deploy the Client software using the following mechanisms:		
25.1	Client Packager (Executable & Microsoft Installer (MSI) Package Format)		
25.2	Web install page		
25.3	Login Script Setup		
25.4	Remote installation		
25.5	From a client disk image		

25.6	Support MS Systems Management Server (SMS)		
26	Must provide a secure Web-based management console to give administrators transparent access to all clients and servers on the network		
27	The management server should be able to download updates from different source if required, which could be the vendor's update server, any other server or a UNC path		
28	If the update from the Management server fails, the security clients with the privilege should be able to get updated directly from the vendor's server		
29	Must reduce network traffic generated when downloading the latest pattern by downloading only incremental patterns		
30	Must have the flexibility to roll back the Virus Pattern and Virus Scan Engine if required via the web console		
31	Should have role based administration with active directory integration		
31.1	To create custom role type		
31.2	To add uses to a predefined role or to a custom role		
32	Should have integration with the Active directory		
33	Shall support grouping of clients into domains for easier administration		
34	Establish separate configuration for internally versus externally located machines (Policy action based on location awareness)		
35	Shall offer centrally managed Client Firewall and IDS		
36	Must be capable of uninstalling and replacing existing client antivirus software (Provide the detailed list)		
37	Must support plug-in modules designed to add new security features without having to redeploy the entire solution, thereby reducing effort and time needed to deploy new security capabilities to clients and servers across the network		
38	All Office Scan client features (antivirus, anti-spyware, Enterprise Client Firewall and damage cleanup) are installed at the same time via client deployment methods and managed centrally via the web-based management console		
39	Security Compliance leverages Microsoft Active Directory services to determine the security status of the computers in the network		
E.	Platform Support		
40	Windows 2000		
41	Windows XP/2003 32-bit Edition		
42	Windows XP/2003 64-bit Edition		
43	Windows Vista (32-bit & 64-bit)		
44	Microsoft Windows Storage Server 2003		
45	Windows 7, 32-bit version & 64-bit version		
46	Microsoft Cluster Server 2003		
47	Windows Server 2008 and Windows Server 2008 R2, 64-bit version		
48	client installation on guest Windows 2000/2003/2008 operating systems hosted on the following virtualization applications:		
49	VMware ESX/ESXi Server 3.5 or 4 (Server Edition)		
49.1	* VMware Server 1.0.3 or later (Server Edition)		
49.2	* VMware Workstation and Workstation ACE Edition 6.0		

50	Should support Intel x64 processor & AMD x64 processor		
51	Should support wireless devices such as Palm, Pocket PC, and EPOC at no extra cost		
F.	Notification, Reporting and logging		
52	Must be able to send notifications whenever it detects a security risk on any client or during a security risk outbreak, via E-mail, Pager, SNMP trap or Windows NT Event log		
53	Should have a feature similar to Firewall Outbreak Monitor which sends a customized alert message to specified recipients when log counts from IDS, personal firewall, and/or network virus logs exceed certain thresholds, signalling a possible attack.		
54	Must be able to send a customized notification message to specified recipients when firewall violations exceed certain thresholds, which may signal an attack		
55	Shall offer customizable & standard notifications via - SMTP, SNMP, Pager, NT Event Log		
G.	Certifications		
56	Must be certified by Microsoft to support the Windows™ Vista™ platform (32-bit and 64-bit).		
57	Must be Checkmark certified by West Coast Labs for Anti-Spyware Desktop, Anti-Trojan & Anti-Virus Desktop		

Signature _____

Date:

Name _____

In capacity of _____

Name of the organization & seal

ITEM SET 17
Antivirus Software Enterprise Version
(To be kept in the first envelope: Technical Bid)
Form 2

1. Name of Organization :

2. Address :
.....
.....

3. Details of Bank Draft, in favour of Head IT Centre, payable at Indore.

i) EMD:

a. Name of Bank & Branch: _____

b. Draft no. and date: _____

ii) Tender form price (In case downloaded from the website): Rs. 1000/-

a. Name of Bank & Branch: _____

b . Draft no. and date: _____

4. Contact person name and phone number :- _____

Signature:.....

Name:

Date:

Seal:

ITEM SET 17
Antivirus Software Enterprise Version
 (To be kept in the third envelope: Financial Bid)

Form 3

Specifications:

Format for Financial Bid to be kept in the envelope superscribed with “Antivirus Software Enterprise Version”

Financial Bid

The Financial Bid may be submitted in the following Format. (Cost for each item may be mentioned separately).

S/N	Product Code	Description	Qty	Unit Price	Applicable Taxes	Total Price
1.1	<u>Supply & Installation of Corporate licenses of Antivirus Software Enterprise Version</u>	<u>“Antivirus Software with Centralised product/Threat Management /Reporting console”</u>	500 Licences			
1.2	-do-	-do-	501-600			
1.3	do-	do-	601-700			
1.4	do-	do-	701-800			
1.5	do-	do-	801-900			
1.6	do-	do-	901-1000			
2	Annual Licence Renewal Fee for second year	-do-				
3	Annual Licence Renewal Fee for third year	-do-				

Signature _____

Date:

Name _____

In capacity of _____

Name of the organization & seal

ITEM SET 18

CORE SWITCH [Cisco/HP/Juniper/Dlink make]
(To be kept in the first envelope: Technical Bid)

Form 1

Specifications:

To be kept in the envelope superscribed with “Technical Bid” –

We are ready to supply the following Items with features as mentioned below:

A. Core Switch Chassis

S/N	Parameter	Description	Any Deviations? Yes/No	Deviation Details
1	I/O Ports	2 switch fabric slots		
		6 I/O module slots		
		Supports a maximum of 52 10-GbE ports or 288 auto-sensing 10/100/1000 ports or 288 SFP ports, or a combination		
		2 power-supply slots		
2	Memory and Processor	Fabric: MIPS64 @ 600 MHz, 64 MB flash, 512 MB RAM		
		I/O Module: MIPS64 @ 400 MHz, 512 MB RAM		
3	Throughput	492 million pps		
4	Routing/switching capacity	768 Gbps		
5	Routing table size	256000 entries		
6	MAC address table size	512,000 entries		
7	Client management	IMC - Intelligent Management Center; command-line interface; Web browser; out-of-band management (serial RS-232C); SNMP Manager; Telnet; terminal interface (serial RS-232C); modem interface; IEEE 802.3 Ethernet MIB; Ethernet Interface MIB		
8	Reliability	Availability	99.999%	
9	Warranty	Minimum three Years		

B. Accessories
I AC Power Supply

S/N	Parameter	Description	Any Deviations? Yes/No	Deviation Detail
1	Power rating	Approx. 2800W		

II Fabric Module

S/N	Parameter	Description	Any Deviations? Yes/No	Deviation Detail
1	Throughput	384 Gbps L3 switch fabric module		

III L2 Module

S/N	Parameter	Description	Any Deviations? Yes/No	Deviation Detail
1	Ports	48 auto-sensing 10/100/1000 ports(IEEE 802.3 Type 10Base-T, IEEE 802.3u Type 100Base-TX, IEEE 802.3ab Type 1000Base-T),		

IV L2 Module

S/N	Parameter	Description	Any Deviations? Yes/No	Deviation Detail
1	Ports	24 gigabit fibre ports, supporting single mode fibre		

For other Technical Specifications that are required, refer annexure 'E'

Signature _____

Date:

Name _____

In capacity of _____

Name of the organization & seal

ITEM SET 18

CORE SWITCH

(To be kept in the first envelope: Technical Bid)

Form 2

1. Name of Organization :

2. Address :
.....
.....

3. Details of Bank Draft, in favour of Head IT Centre, payable at Indore.

ii) EMD:

a. Name of Bank & Branch: _____

b. Draft no. and date: _____

ii) Tender form price (In case downloaded from the website): Rs. 1000/-

a. Name of Bank & Branch: _____

b . Draft no. and date: _____

4. Contact person name and phone number :- _____

Signature:.....

Name:

Date:

Seal:

ITEM SET 18

CORE SWITCH

(To be kept in the third envelope: Financial Bid)

Form 3

Specifications:

Format for Financial Bid to be kept in the envelope superscribed with “CORE SWITCH”

Financial Bid

The Financial Bid may be submitted in the following Format. (Cost for each item may be mentioned separately).

S/N	Product Code	Description	Qty	Unit Price	Applicable Taxes	Total Price
1.1	<u>Supply, Installation & configuration of chassis switch</u>	6 I/O module slots switch chassis 2800 W A/c power supply L3 Switch fabric modules 48 Port L2 Gig-T modules 24 port L2 gig SFP modules Other specifications as mentioned in the annexure “E” and technical specifications	1 2 2 1 1			

Signature _____

Date:

Name _____

In capacity of _____

Name of the organization & seal

ITEM SET 19
EDGE SWITCH [Cisco/HP/Juniper/Dlink make]

(To be kept in the first envelope: Technical Bid)

Form 1

Fixed Port L2 Managed Ethernet Switch

S/N	Parameter	Description	Any Deviations? Yes/No	Deviation Details
1	I/O Ports	20 auto-sensing 10/100/1000 ports(IEEE 802.3 Type 10Base-T, IEEE 802.3u Type 100Base-TX, IEEE 802.3ab Type 1000Base-T), Media Type: Auto-MDIX, Duplex: 10Base-T/100Base-TX: half or full 1000Base-T: full only 4 dual-personality ports, each port can be used as either an RJ-45 10/100/1000 port or an open mini-GBIC slot (for use with mini-GBIC transceivers)		
2	Memory and Processor	Processor : MIPS @ 264 MHz, 16 MB flash, packet buffer size: 0.75 MB, 64 MB SDRAM		
3	Latency	Less than 5.6 μ s (FIFO 64-byte packets)		
4	Throughput	up to 35.7 million pps		
5	Switching capacity	48 Gbps		
6	MAC address table size	8,000 entries		
7	Client management	IMC - Intelligent Management Center; command-line interface; Web browser; out-of-band management		
8	Warranty	Minimum three years		

For other Technical Features that are required, refer annexure 'F'

Signature _____

Date:

Name _____

In capacity of _____

Name of the organization & seal

ITEM SET 19

EDGE SWITCH [Cisco/HP/Juniper/Dlink make]
(To be kept in the first envelope: Technical Bid)
Form 2

1. Name of Organization :

2. Address :
.....
.....

3. Details of Bank Draft, in favour of Head IT Centre, payable at Indore.

iii) EMD:

a. Name of Bank & Branch: _____

b. Draft no. and date: _____

ii) Tender form price (In case downloaded from the website): Rs. 1000/-

a. Name of Bank & Branch: _____

b . Draft no. and date: _____

4. Contact person name and phone number :- _____

Signature:.....

Name:

Date:

Seal:

ITEM SET 19

EDGE SWITCH

(To be kept in the third envelope: Financial Bid)

Form 3

Specifications:

Format for Financial Bid to be kept in the envelope superscribed with “EDGE SWITCH”

Financial Bid

The Financial Bid may be submitted in the following Format. (Cost for each item may be mentioned separately).

S/N	Product Code	Description	Qty	Unit Price	Applicable Taxes	Total Price
1.1	EDGE SWITCH ES	Fixed Port L2 Managed Ethernet Switch with 20 auto-sensing 10/100/1000 copper ports and 4 dual personality ports	Max. 10			

Signature _____

Date:

Name _____

In capacity of _____

Name of the organization & seal

ITEM SET 20

LINUX OPERATING SYSTEM
(To be kept in the first envelope: Technical Bid)

Form 1

Specifications:

**To be kept in the envelope superscribed with “Technical Bid –
We are ready to supply the following Items with features as mentioned below :**

S/N	Description	Deviations ? Yes / No	Deviation Details
A	Capabilities		
	Red Hat Enterprise Linux 6 (Supported Architectures Intel & AMD x86/x86-64) -2 socket with unlimited virtual guest (Standard subscription 1 year) -4 sockets with up to 4 virtual guest Standard Subscription 1(year)		

Signature _____

Date:

Name _____

In capacity of _____

Name of the organization & seal

ITEM SET 20

LINUX OPERATING SYSTEM
(To be kept in the first envelope: Technical Bid)
Form 2

1. Name of Organization :

2. Address :
.....
.....

3. Details of Bank Draft, in favour of Head IT Centre, payable at Indore.

iv) EMD:

a. Name of Bank & Branch: _____

b. Draft no. and date: _____

ii) Tender form price (In case downloaded from the website): Rs. 1000/-

a. Name of Bank & Branch: _____

b . Draft no. and date: _____

4. Contact person name and phone number :- _____

Signature:.....

Name:

Date:

Seal:

ITEM SET 20

LINUX OPERATING SYSTEM
(To be kept in the third envelope: Financial Bid)

Form 3

Specifications:

Format For Financial Bid to be kept in the envelope superscribed with “Linux Operating System”

Financial Bid

The Financial Bid may be submitted in the following Format. (Cost for each item may be mentioned separately).

S/N	Product Code	Description	Qty	Unit Price	Applicable Taxes	Total Price
1	<u>Supply of LINUX OPERATING SYSTEM</u>	Red Hat Enterprise Linux 6 (Supported Architectures Intel & AMD x86/x86-64) -2 socket with unlimited virtual guest (Standard subscribing 1 year) -4 sockets with upto 4 virtual guest (Standard Subscription 1year)	2 2			

Signature _____

Date:

Name _____

In capacity of _____

Name of the organization & seal

ITEM SET 21

Comprehensive AMC for Wireless Network in University Hostels

General Conditions of Contract (GCC) (Documentary evidence of all the claims must be submitted)

2. Minimum Eligibility for tenderers:

- **Experience:** Minimum three years experience of maintaining Wireless Network of size, services & platform similar to DAVV network (Refer Annexure G, H or visit campus for more details) in Madhya Pradesh.
- **Local Manpower Availability:** Vendor should have at least 5 engineers at Indore

11. The tenderer should have their local office in Indore for last 5 years.

12. The tenderer should be ISO 9001 Certified.

13. The tenderer cannot transfer awarded contract into subcontract.

14. The tenderer should submit certified original copy of satisfactory performance of the quoted AMC work. Giving the details about the location, network services and network equipments.

15. The individual signing the Tender Document and other documents on behalf of the tenderer should submit proof in support of his /her authority.

16. University may modify the Scope of work in the best interest of the project if the necessity arises as and when the project is reviewed. Any change or modification in the scope of work or the content will be intimated in writing to the executing tenderer.

17. The successful tenderer shall provide the services and carry out its other obligations under the agreement with due diligence, efficiency and economy. It shall apply appropriate advanced technology and safe and effective methods during execution of this contract.

8. The EMD shall stand forfeited if the successful tenderer, whose tender is accepted, fails or refuses to furnish the security deposit amount within a fortnight from the date of acceptance of his offer, fails or refuses to execute the contract. No interest would be payable for any period on EMD. The amount of EMD will be refunded only after finalisation of tenders, and on receipt of written request from the unsuccessful tenderers. The EMD in case of successful tenderer may be adjusted against security deposit. It will be refunded only after the receipt of the Prescribed Security Deposit.

9. Termination for Default:

In course of two months trial maintenance, University, without prejudice to any other remedy for breach of contract, by written notice of default sent to the tenderer terminate the contract in whole or in part there of, and amount of performance security deposit shall stand forfeited.

10. Performance Security:

- The selected tenderer shall furnish performance security for an amount equal to 20% of the contract value within a fortnight's time after receipt of communication of formal letter of acceptance of his offer, or work order.
- The proceeds of the performance security shall be payable to the university as compensation for any loss resulting from the contract failure to complete its obligations under the contract.
- The performance security may be paid in the form of a bank guaranty issued by a scheduled bank and in the form provided in the tender documents.
- The performance security bond will be discharged after completion of the contractor performance obligations under the contract.

11. Payment Terms:

Payment will be made on quarterly basis, after deduction of the penalty amount if any. The payment will be made to the contractor by the way of account payee cheque after necessary deduction of income tax, commercial tax and any other taxes as applicable at that time from source for which the pre received invoice in duplicate will be required to submit by the contractor.

12. All disputes shall be subject to Indore jurisdiction.

SPECIAL CONDITIONS OF THE CONTRACT

- Initially the successful tenderer shall be required to maintain the network for two month on trial basis. On the basis of successful completion of the trial period, certified by the Head, IT Centre, the contract will be awarded, initially for one year, which can be extended further for two more years on the basis of annual reviews. During the trial period, if performance is not satisfactory and the tenderer fails to perform, then next lowest tenderer will be invited for the trial offer. In case of failure no payment will be made for trial period. However, in case of successful trial, payment will be made for trial period also.
- The renewal of the contract after every year will depend on performance of the agency. In case the performance is not found satisfactory the contract will be terminated.
- All hardware and relevant Networking software necessary for proper functioning of the network shall be covered under the contract.
- In case of failure of networking services the fault should be repaired within stipulated time, failing which a penalty will be imposed. Refer Annexure “T” for penalty provisions.
- The maintenance service consists of preventive and corrective maintenance of equipment and will include replacement of parts.
- The tenderer is required to maintain the security of the network. Tندرer will be responsible for controlling access of the network.
- The tenderer is required to perform weekly analysis of network health and must provide report accordingly. Required analysis tools will be managed by tenderer only.
- The tenderer is required to perform network audit twice in a month.
- The bank guaranty for security deposit amounting to 20% of one year's AMC charges will have to be deposited by the contractor before commencement of AMC and it shall be renewed every year, in advance.
- The B.G. shall be released after the expiry of the AMC period.
- At any time during the contract period any type of computer, network device can be added or deducted from the contract, proportionate payment/deduction will be made in such cases.

ITEM SET 21
Comprehensive AMC for Wireless Network in University Hostel
General Information about the tenderer
 (To be Kept in the first envelope)

Sno.	Particulars	Details
1	Name and Address of the Tenderer	
2	Name and Mobile number of the contact person	
4	Office Telephones	
5	Fax Number	
6	e-mail address	
7	Name of the Chief Executive and Telephone No	
8	Name(s), contact number and address(s) of proprietor or Directors.	
9	Sales Tax / Commercial Tax CST Nos.	
10	Income Tax PAN / GIR No	
11	Annual Turnover for the Last 3 Years : <div style="text-align: right; margin-right: 50px;"> 2008-09 2009-10 2010-11 </div>	
12	List of Major Clients and Size of Orders executed	

Signature Of Tenderer
 With Stamp & Seal

ITEM SET 21
Comprehensive AMC for Wireless Network in University Hostels
Form 1
[To be kept in the first envelope]

Tenderer/Firm's Name

[Indore :]

To:

The Registrar
DAVV, Indore.

Dear Sir,

We, the undersigned, have examined the Tender Document, hereby offer to provide maintenance and services in accordance with the same. We are hereby submitting our Proposal, which includes this Pre-Qualification Information, Technical proposal and Commercial proposal.

We have enclosed the Earnest Money Deposit in the form of Bank Draft, as mentioned in the tender document.

All the rates quoted in our proposal are in accordance with the terms as specified in tender documents. All the prices and other terms and conditions of this proposal are valid for a period of 180 calendar days from the last date of submission of tenders.

We do hereby confirm that our prices include all taxes including Sales tax/VAT and service tax. We have studied the clauses relating to Indian Taxes and hereby declare that if any Tax, Surcharge on Tax and any other Corporate Tax altered under the law, we shall pay the same.

We declare that all the services shall be performed strictly in accordance with the technical specifications and other tender conditions except the deviations as mentioned in the technical deviation proforma. We further declare that the rates stated in our proposal are in accordance with your terms and conditions in the tender document, except the deviations as mentioned in the commercial deviation proforma.

Our proposal is binding upon us and subject to the modifications resulting from the Contract negotiations. Until a formal contract is prepared and executed, this bid together with your written acceptance thereof and your notification of award shall constitute a binding Contract between us.

We understand that you are not bound to accept any/ all Proposal(s) you receive.

We remain,

Yours sincerely,

Authorized Signature:

Name and Title of Signatory:

Name & Address of Agency/Firm:.....

ITEM SET 21

Comprehensive AMC for Wireless Network in University Hostels.

Form 2

[To be kept in the first envelope]

Pre-Qualification Information Sheet

3. Name of Agency/ Firm :

4. Organization Type :

3. Address :
.....
.....

6. Agency's experience (in years) related to the scope of work:.....

7. Last three years, year wise total turnover:(also attach the proof giving details)

6. Last three years turnover from AMC services only, excluding hardware sale (Give Year wise figures) :(attach the proof giving details)

7. Details of Bank Draft, in favour of Head IT Centre, payable at Indore.

1. EMD: Rs.

a. Name of Bank & Branch:

b. Draft no. and date:

2. Tender form price (In case downloaded from the website): Rs. 1000/-

a. Name of Bank & Branch:

b. Draft no. and date:

8. List of top Five customers, along with their addresses, nature of contract, annual contract value, contact persons and their phone numbers:

.....

9. Details of certifications (if any) related to services:

Signature:

Name:

Date:

Seal:

ITEM SET 21
Comprehensive AMC for Wireless Network in University Hostels.

Form 3

[To be kept in the first envelope]

Technical Competence and work experience

Give details of customers in the following format, having campus network of similar type dimension. Refer Annexure G & H for the details of the Network.

Sl.No	Particulars	Details
1	Name of the Client	
3	Address	
4	Nature of contract & Description of Actual Services Provided	
5	Annual Contract Value	
6.	Starting Date & total period	
7	Number & Name of the Senior Staff involved and Functions performed	
8	Project Implemented at -(University/ /Private /Govt)	

Authorized Signature:

Name and Title of Signatory:

Name & Address of Agency/Firm:.....

Organization's Seal:

ITEM SET 21
Comprehensive AMC for Wireless Network in University Hostels.

Form 5
[To be kept in the first envelope]

TECHNICAL DEVIATIONS

Following are technical deviations and variations from the tender document, these deviations and variations are exhaustive. Except these deviations and variations, the entire work shall be executed as per tender document specifications.

Sr. No.	Clause No.	Page No.	Statement of Deviations and Variations

Date

(Name & Signature)

Place

(In the capacity of:

Duly authorized to sign Tender for and on behalf of

.....

Name of the organization & seal

ITEM SET 21

Comprehensive AMC for Wireless Network in University Hostels.

Form 6
[To be kept in the third envelope]

Financial Bid

Having examined the conditions of the tender and specifications, including all the annexures, the receipt of which is hereby duly acknowledged, we the undersigned, offer to provide comprehensive AMC of the network & associated services in conformity with the said conditions of tender.

Our bid for :(For one year, valid for three years)

SNo.	Details	Amount(Rs.)	Remarks
1.	Charges for comprehensive AMC of H/W as specified in annexure H and wireless connectivity		
2.	Details of taxes, other charges and discounts (if any).		

1. We undertake, if our tender is accepted, AMC will commence within 2 weeks, from the date of issue of your work order.
2. Tender submitted by us is properly wax sealed and prepared so as to prevent any subsequent alteration and replacement. All the tender documents, duly signed are enclosed herewith.
3. Until a formal work order of contract is prepared and executed this tender together with your written acceptance thereof, in your notification of award, shall constitute a binding contract between us.
4. If our tender is accepted, we will obtain the guarantee of a scheduled bank for a sum amounting to 20% of the contract sum for the due performance of contract
5. We understand that you are not bound to accept the lowest or any tender, you may receive.

Name of the organization & seal

Signature _____
Name _____
In capacity of _____
Date: _____

Duly authorised to sign the tender for and on behalf of _____

IT Centre Profile:

IT Centre was established in the year 2000 to create a Campus Wide Network by interconnecting various campuses and departments with the following objectives:

- To improve quality of research, teaching and learning by providing the Internet access to faculty, research scholars and students.
- To share University documents and resources.
- To improve reliability, quality and efficiency of University operations.

First phase which was completed in April 2001, networked 18 departments having 524 nodes. Second phase was completed in Oct 2002, which connected ten more departments and installed 331 additional nodes. During third phase we have connected IET and Nalanda Campus to our central server located at IT Centre, Khandwa Road Campus. IET has been connected by laying 2.1 kilometer fibre optic cable and also Nalanda Campus, which is six kilometer away from Khandwa Road Campus, is connected using optical fibre.

During third phase expansion additional 150 nodes have been added to Nalanda Campus, RNT Marg Network and 128 nodes to IET network.

After completion of third phase i.e. from Feb, 2004 all the departments of the University are now on Campus LAN having access to the Internet.

Under UGC-INFONET scheme, from Jan 2004, UGC has provided our University free subscription to the various e-Journals along with 10Mbps bandwidth through BSNL.

Vital Statistics:

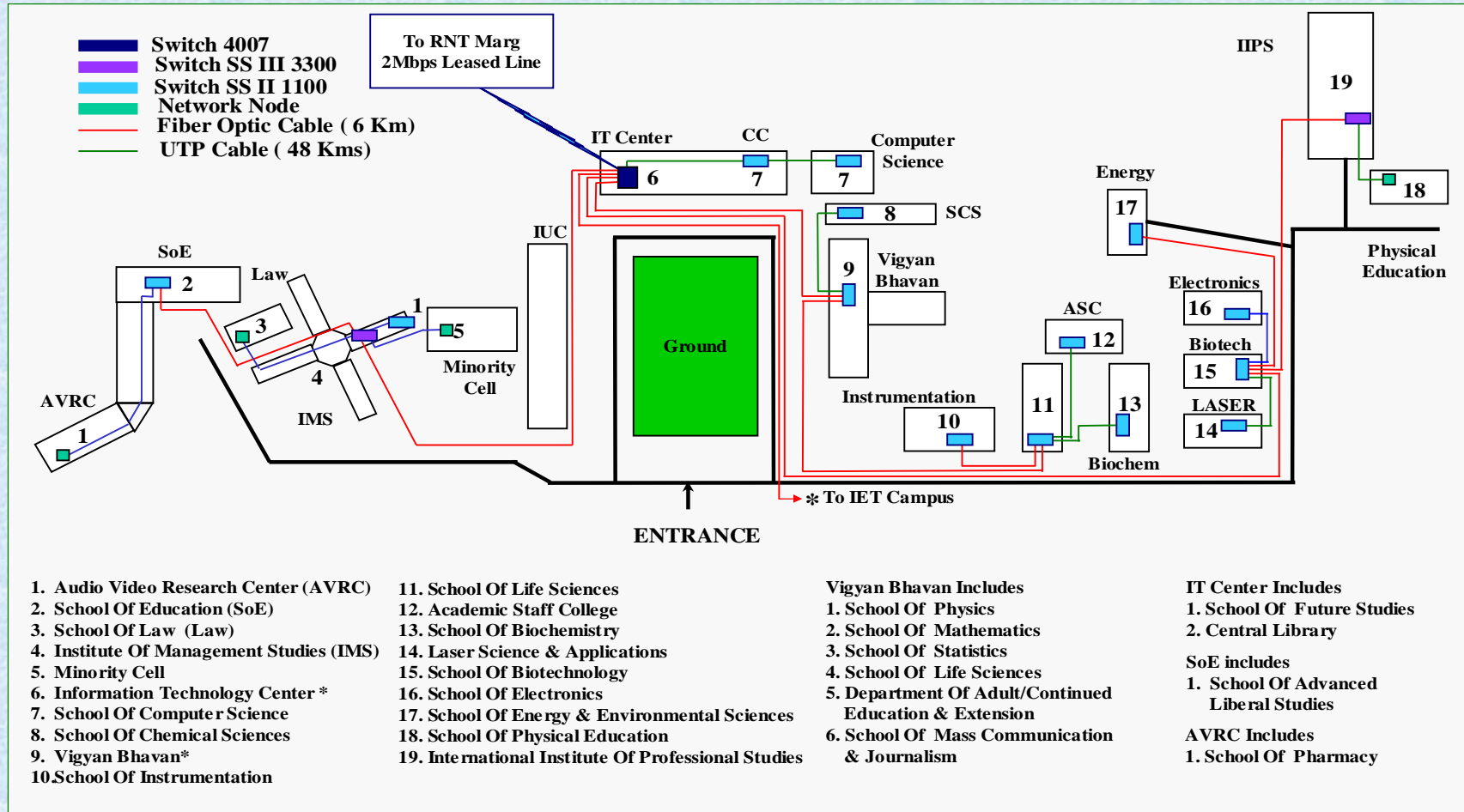
- 44 Departments spread across three campuses are connected using extended star topology
- 1500 Nodes
- 90 Switches [3COM 1100/3300/4007,D-Link]
- More than 5000 users
- 1Gbps Internet leased line connectivity from BSNL
- 10 Mbps leased line connectivity from BSNL
- Fiber Optic Cable length (Backbone): 12 Kilometre
- UTP Cable length (Copper Wires, within the departments): Approx. 60 KM.
- Servers: DNS Server, Mail Server, Web Server, Proxy Server, Chat Server, LDAP Server, Network Management Station.
- UTM/Router : CISCO-ASA-5520 Firewall, Fortigate-110C Firewall, CISCO Router-2800 series.

- Operating system: Linux /Windows/Sun-Solaris.

Internet access is provided to all departments using fibre optic backbone and 1Gbps leased line. The centre is equipped with an array of servers using 10 hours battery backup. Internet access is available to departments round the clock (24 x 7). There are more than 125 computers in the IT Centre Lab providing Internet access to students from 9:00 AM to 9:30 PM.

Devi Ahilya Vishwavidyalaya Khandwa Road Campus-wide Network Layout

Overview



ITEM SET 16

Comprehensive AMC for Campus Wide Network & Facility Management Services.

Annexure B

Please note that the following list of items is to give an idea of various devices being used. AMC is not required for all of the items. The items for which AMC is required is mentioned in front of quantity

#	Item Description	Quantity	To be given for AMC
1	Servers HP ML-570	1	No
	(4 processors,4 GB RAM)		
	Intel(R) Xeon(TM) MP CPU 3.16GHz		
	Servers HP ML-350	4	No
	(4 processors,4 GB RAM)		
	Intel(R) Xeon(TM) MP CPU 3.16GHz		
	Servers IBM e-series, X-336	2	No
	(2 processors,4 GB RAM)		
	Intel(R) Xeon(TM) MP CPU 3.16GHz		
	Servers IBM e-series, X-236	2	No
	(2 processors,4 GB RAM)		
	Intel(R) Xeon(TM) MP CPU 3.16GHz		
	Wipro xeon server	3	No
	Intel® Xeon,CPU 3.2 Ghz.,4 processor	1	No
2	Switch I – 3COM Switch 4007	1	No
	3COM Chassis switch 4007, one power supply and switch controller module	1	No
	20 Ports 100 Base FX (one module)		No
	12 Ports module of 10/100 TX and 36 Ports module of 10/100 TX (Total 48, 10/100 Tx ports)		No
3	Switch II – SS3300, 10/100 Main switch	2	No
	SuperStack 3300 with 24x 10/100 BTX ports and one optional high speed module slot		
4	Switch III – SS1100	61	No
	SuperStack 1100, 24*10 baseT ports with two built in 100 BaseTX ports and one optional high speed module slot		
5	Switch IV- SS4300	1	No
	SuperStack 4300, 48*10 baseT / 100 base Tx ports and two optional high speed module slot		
6	Cisco 2800 router	1	No
7	One port 100 baseFX module (Common to 3300 and 1100)	5	NO
8	Two ports 100baseFX module (Common to 3300 and 1100)	9	NO
9	Two ports 100baseFX module (For 4300)	1	NO
10	Cisco ASA 5500 Series	1	No
11	Fortigate firwall FG110C	1	No

Facility Management Services:**1. Network Administration:**

- 1.a. NW Management: Routine monitoring and management of the network devices and links/segments at DAVV campus using the available resources. Identification of the problem in the connectivity and fixing the problem, if any link is found faulty. However all expenses related to the repairing of passive segments shall be paid by DAVV on actual.
- 1.b. Configuration Fine-Tuning.
 - 1.b.i. DAVV has various active & passive networking devices installed at Takshashila Campus, RNT Marg Campus and IET Campus. The active devices have been configured to satisfy the current connectivity requirement at the DAVV campus. Periodic inspection and analysis of the existing configurations and fine-tuning / modification for the optimal usage of features and functionalities suiting to DAVV's policies and requirements. Interaction & coordination with ISP's for proper functioning of leased lines.
 - 1.b.ii. Assist DAVV in integration of new network equipment & upgrade in the existing network.
 - 1.b.iii. Desktop Support: Troubleshooting of user machine including antivirus software installation, formatting, network connectivity and performance related issues.
- 1.c. IP addressing Schema: Continuous evaluation of the existing IP addressing scheme and modifications, if needed.
- 1.d. Single Sign-On: Configuration and administration of existing Single Sign-On authentication scheme for the network users across the campus, which currently includes web and mail services . This also includes integration of new server/services.
- 1.e. Network Management System: Maintenance of existing **Linux based** Network Management System for the current network infrastructure. This includes integration of additional servers/services.
- 1.f. Policy framework setup and implementation: Assist DAVV in setting up a proper policy framework for network access, management and various services.
- 1.g. Backup Solution: Implementation, configuration and administration of a backup server for backup of data and configuration from various servers.

2. Web Services

- 2.a. OS Upgrade: Up gradation of the current Linux operating system to the latest version and migrate

the current data and configuration to the new version. The licensed media of latest version will be provided by DAVV.

- 2.b. Domains: Configuration for Domains and DNS updates along with web server configurations.
- 2.c. Content Hosting: Assist in data porting on the web server including creation of data-space and configuration. However content creation will be DAVV responsibility.
- 2.d. Regular backup of configuration files and data.

3. Mail Services

- 3.a. OS Upgrade: Up gradation of the current Linux operating system to the latest version and migrate the current data and configuration to the new version. The licensed media of latest version will be provided by DAVV.
- 3.b. Domains: This includes creation of Domains, DNS updates and mail server configuration.
- 3.c. Regular Backup of configuration files and data.

4. Proxy Services

- 4.a. OS Upgrade: Up gradation of the current Linux operating system to the latest version and migrate the current data and configuration to the new version. The licensed media of latest version will be provided by DAVV.
- 4.b. Access Control & Content filtering: Assist DAVV in setting up a policy framework & configuring the access control & content filtering.
- 4.c. Regular Backup of configuration files and logs.

5. Security

- 5.a. Implementation & Monitoring of Intrusion Detection System (IDS) at IT Center, DAVV. The exact deployment plan will be concluded with mutual discussions.
- 5.b. Charges for additional activities may be quoted separately. Charges for unanticipated activities may be decided as per mutually agreed upon rates.
- 5.c. Continuous monitoring and evaluation of the security threats and possible solutions to be implemented in the following areas:

Internal and External Security threats.

Various firewalls and other security products for DAVV requirement.

Policy framework formation for implementing sub-net level security

Host level security using OS features and capabilities.

6. **Configuration and fine tuning of services based on fortigate FG110C, CISCO ASA-5520 Firewall: - Gateway level firewall services. Firewall configured with antivirus, ant spam, content filtering and VPN feature.**

7. The activities carried out under this contract will be discussed and reviewed jointly on monthly basis as per mutually agreed upon schedule.

In addition to above the following services are also covered under the scope of associated services:

- Firewall
- Name Server(s)
- Directory server(s)
- NMS
- Proxy Analysis
- Terminal servers
- VOIP Server etc,
- Departmental firewalls and Wireless access
- Applying software patches
- Performance monitoring
- Documentation and Network audit etc.

Note: Necessary hardware/Software will be provided by the DAVV.

Annexure “D”

Penalty Provisions:

For Hardware equipments.

- Delay will be calculated from the date and time of registering the fault with the resident service engineer.
- Any fault should be attended immediately and must be set right within 24 hours. Failure to maintain above dead line would result in penalty charges as under:

If a service is not available for more than twenty four hours then penalty will be applicable.

Following are the details of penalty charges.

Service down for > 24 hours	Penalty Charges
Web Services	Rs.2000/- per day
Mail Service	Rs.2000/- per day
DNS Service	Rs.3000/- per day
LDAP Service	Rs.3000/- per day
Proxy Service	Rs.3000/- per day
Departmental firewall	Rs.1000/- per day
Internet access	Rs.3000/- per day
Desktop	Rs. 1000/- per day

Absence of service engineer: Rs. One thousand per day.

In any case maximum penalty would not exceed 50% of the total AMC charges. Service providers must maintain sufficient number of spare parts at DAVV to fulfil the above conditions. In case services are not restored within three days, DAVV shall be free to get the work done through any agency and expenditure incurred on this account due to failure of the contractor to deliver the services shall be deducted from the balance payment or security deposit.

Signature _____

Date:

Name _____

In capacity of _____

Name of the organization & seal

Core Switch Chassis

Feature:

Quality of Service (QoS)

- **IEEE 802.1p prioritization:** delivers data to devices based on the priority and type of traffic
- **Class of Service (CoS):** sets the IEEE 802.1p priority tag based on IP address, IP Type of Service (ToS), Layer 3 protocol, TCP/UDP port number, source port, and DiffServ
- **Bandwidth shaping:**
 - Port-based rate limiting: provides per-port ingress/egress enforced maximum bandwidth
 - Classifier-based rate limiting: uses access control list (ACL) to enforce maximum bandwidth for ingress traffic on each port
 - Guaranteed minimum: provides per-port, per-queue egress-based guaranteed minimum bandwidth
- **Congestion avoidance:** weighted Random Early Detection (WRED)/RED
- **Powerful QoS feature:** supports the following congestion actions: strict priority (SP) queuing, weighted round robin (WRR), WFQ, and WRED
- **Traffic policing:** supports Committed Access Rate (CAR) and line rate

Intrusion detection/prevention system (IDS/IPS)

- **Deep packet inspection:** module supports deep packet inspection and examines the packet payload as well as the frame and packet headers; packets are dropped if attacks or intrusions are detected using signature-based or protocol anomaly-based detection
- **Signature-based detection:** detects attacks that have known attack patterns; IPS maintains a signature database that contains the pattern definitions for known attacks that can be automatically updated using a subscription service
- **Protocol anomaly-based detection:** detects attacks that use anomalies in application protocol payloads
- **Severity-based action policies:** involve action taken against attacks based on their severity; available actions are “allow,” “block,” and “terminate connection” to provide appropriate mitigation
- **Signature update service:** provides regular updates to the signature database, helping to ensure that the latest available signatures are installed

Firewall

- **Stateful firewall:** enforces firewall policies to control traffic and filter access to network services; maintains session information for every connection passing through it, enabling the firewall to control packets based on existing sessions
- **Zone-based access policies:** logically groups virtual LANs (VLANs) into zones that share common security policies; allows both unicast and multicast policy settings by zones instead of by individual VLANs
- **Application-level gateway (ALG):** deep packet inspection in the firewall discovers the IP address and service port information embedded in the application data; the firewall then dynamically opens appropriate connections for specific applications
- **NAT/PAT:** choice of dynamic or static network address translator (NAT) preserves a network's IP address pool or conceals the private address of network resources, such as Web servers, which are made accessible to users of a guest or public wireless LAN

Virtual private network (VPN)

- **IPSec:** provides secure tunneling over an untrusted network such as the Internet or a wireless network; offers data confidentiality, authenticity, and integrity between two endpoints of the network
- **Generic Routing Encapsulation (GRE):** can be used to transport Layer 2 connectivity over a Layer 3 path in a secured way; enables the segregation of traffic from site to site
- **Manual or automatic key exchange (IKE):** provides both manual or automatic key exchange required for the algorithms used in encryption or authentication; auto-IKE allows automated management of the public key exchange, providing the highest levels of encryption

Management

- **Management interface control:** provides management access through modem port, terminal interface, as well as in-band and out-of-band Ethernet ports; provides access through terminal interface, telnet, or SSH
- **Industry-standard CLI with a hierarchical structure:** reduces training time and expenses, and increases productivity in multivendor installations
- **Management security:** multiple privilege levels, with password protection, restrict access to critical configuration commands; ACLs provide telnet and SNMP access; local and remote syslog capability allow logging of all access
- **SNMPv1, v2, and v3:** provide complete support of SNMP; SNMPv3 supports increased security using encryption; provide full support of industry-standard MIBs plus private MIB extensions
- **Web management:** embedded HTML management tool with secure access (SSHv2)
- **sFlow (RFC 3176):** provides scalable, ASIC-based wire-speed network monitoring and accounting with no impact on network performance; this allows network operators to gather a variety of sophisticated network statistics and information for capacity planning and real-time network monitoring purposes
- **Remote monitoring (RMON):** uses standard SNMP to monitor essential network functions; supports events, alarm, history, and statistics group plus a private alarm extension group
- **FTP, TFTP, and SFTP support:** File Transfer Protocol allows bi-directional transfers over a TCP/IP network and is used for configuration updates; Trivial FTP is a simpler method using UDP
- **Debug and sampler utility:** supports ping and traceroute for both IPv4 and IPv6
- **Network Time Protocol (NTP):** synchronizes timekeeping among distributed time servers and clients; keeps consistent timekeeping among all clock-dependent devices within the network so that the devices can provide diverse applications based on the consistent time
- **Network Quality Analyzer (NQA):** analyzes network performance and service quality by sending test packets, and provides network performance and service quality parameters such as jitter, TCP, or FTP connection delays and file transfer rates; allows network manager to determine overall network performance and to diagnose and locate network congestion points or failures
- **Info center:** provides a central information center for system and network information; aggregates all logs, traps, and debugging information generated by the system and maintains them in order of severity; outputs the network information to multiple channels based on user-defined rules
- **IEEE 802.1AB Link Layer Discovery Protocol (LLDP):** automated device discovery protocol provides easy mapping by network management applications
- **Dual flash images:** provide independent primary and secondary operating system files for backup while upgrading
- **Multiple configuration files:** can be stored to the flash image

Connectivity

- **High-density port connectivity:** up to 10 interface module slots; up to 84 10-GbE ports, 480 Fiber Gigabit, or 480 PoE- enabled ports per system

- **Jumbo frames:** are supported on 10 GbE and GbE ports; up to 9000 sizes allow high-performance backups and disaster recovery systems
- **Loopback:** supports internal loopback testing for maintenance purposes and an increase in availability; loopback detection protects against incorrect cabling or network configurations and can be enabled on a per-port or per-VLAN basis for added flexibility
- **Ethernet OAM:** provides a Layer 2 link performance and fault detection monitoring tool, which reduces failover and network convergence times
- **Flexible port selection:** 100/1000Base-X auto speed selection, 10/100/1000Base-T auto speed detection plus auto duplex and MDI/MDI-X
- **Monitor link:** collects statistics on performance and errors on physical links, increasing system availability
- **IEEE 802.3af Power over Ethernet (PoE):** provides up to 15.4 W per port to IEEE 802.3af-compliant PoE-powered devices such as IP phones, wireless access points, and security cameras
- **Dual-personality functionality:** includes four 10/100/1000 ports or SFP slots for optional fiber connectivity such as Gigabit-SX, -LX, -LH, or 100-FX
- **Packet storm protection:** protects against unknown broadcast, unknown multicast, or unicast storms with user-defined thresholds
- **Flow control:** using standard IEEE 802.3x, it provides back pressure to reduce congestion in heavy traffic situations
- **IEEE 802.3at Power over Ethernet (PoE+) support:** provides up to 30 watts of power at the PSE

Performance

- **High-speed fully distributed architecture:**
 - 2.4 Tbps backplane supports 1152 Gbps switching capacity maximum, providing enhanced performance and future expansion capability; with dual fabrics, the switch delivers up to 714 Mpps throughput
 - All switching and routing performed in the I/O modules
 - Meets today's and future demand of enterprise's bandwidth-intensive applications
- **Scalable system design:** backplane designed for bandwidth increases; provides investment protection to support future technologies and higher-speed connectivity
- **Flexible chassis selection:** enables customers to tailor their product selection to their budget with a choice of six chassis, ranging from a 10-slot to a 2-slot

Resiliency and high availability

- **Redundant/Load-sharing fabrics, management, fan assemblies, and power supplies:** increase total performance and power available while providing hitless, stateful failover
- **All modules are hot swappable:** allows replacement of modules without any impact on other modules
- **Dual internal power supply:** provides high reliability
- **Separate data and control paths:** keeps control separated from services and keeps service processing isolated; increases security and performance
- **Passive design system:** backplane has no active components for increased system reliability
- **IEEE 802.3ad Link Aggregation Control Protocol (LACP):** supports up to 128 trunks, each with 8 links per trunk; supports static or dynamic groups and user-selectable hashing algorithm
- **Intelligent Resilient Framework (IRF):** creates virtual resilient switching fabrics, where two or more switches perform as a single Layer 2 switch, Layer 3 router; switches do not have to be co-located and can be part of a disaster recovery system; servers or switches can be attached using standard LACP for automatic load-balancing and high availability; simplifies network operation by eliminating the complexity of Spanning Tree, Equal-Cost Multipath (ECMP), or VRRP
- **Ring Resiliency Protection Protocol (RRPP):** provides standard sub 200 ms recovery for ring Ethernet-based topology

- **Virtual Router Redundancy Protocol (VRRP):** allows a group of routers to dynamically back each other up to create highly available routed environments
- **Hitless patch upgrades:** allow patches and new service features to be installed without restarting the equipment, increasing network uptime and facilitating maintenance
- **Graceful restart:** features are fully supported, including graceful restart for OSPF, IS-IS, BGP, LDP, and RSVP; network remains stable during the active-standby switchover; after the switchover, the device quickly learns the network routes by communicating with adjacent routers; forwarding remains uninterrupted during the switchover to realize NSF
- **Ultrafast protocol convergence (< 50 ms) with standard-based failure detection—**
Bidirectional Forwarding Detection (BFD): enables link connectivity monitoring and reduces network convergence time for RIP, OSPF, BGP, IS-IS, VRRP, MPLS, and IRF
- **Smart link:** allows 50 ms failover between links

Layer 2 switching

- **VLAN:** supports up to 4096 port or IEEE 802.1Q-based VLANs; also supports MAC-based VLANs, protocol-based VLANs, and IP-subnet-based VLANs for added flexibility
- **Port isolation:** increases security by isolating ports within a VLAN while still allowing them to communicate with other VLANs
- **BPDU tunneling:** transmits Spanning Tree Protocol BPDUs transparently, allowing correct tree calculations across service providers, WANs, or MANs
- **GARP VLAN Registration Protocol (GVRP):** allows automatic learning and dynamic assignment of VLANs
- **Port mirroring:** duplicates port traffic (ingress and egress) to a local or remote monitoring port; supports 4 mirroring groups, with an unlimited number of ports per group
- **Spanning Tree:** fully supports standard IEEE 802.1D Spanning Tree Protocol, IEEE 802.1w Rapid Spanning Tree Protocol for faster convergence, and IEEE 802.1s Multiple Spanning Tree Protocol
- **IGMP and MLD snooping:** effectively control and manage the flooding of multicast packets in a Layer 2 network
- **Device Link Detection Protocol (DLDP):** monitors link connectivity and shuts down ports at both ends if uni-directional traffic is detected, preventing loops in STP-based networks
- **IEEE 802.1ad QinQ and Selective QinQ:** increase the scalability of an Ethernet network by providing a hierarchical structure; connect multiple LANs on a high-speed campus or metro network
- **Super VLAN:** RFC 3069 standard, also called VLAN aggregation, is used to save IP address space

Layer 3 services

- **Address Resolution Protocol (ARP):** determines the MAC address of another IP host in the same subnet; supports static ARPs; gratuitous ARP allows detection of duplicate IP addresses; proxy ARP allows normal ARP operation between subnets or when subnets are separated by a Layer 2 network
- **User Datagram Protocol (UDP) helper:** redirects UDP broadcasts to specific IP subnets to prevent server spoofing
- **Dynamic Host Configuration Protocol (DHCP):** simplifies the management of large IP networks and supports client and server; DHCP Relay enables DHCP operation across subnets
- **Domain Name System (DNS):** is a distributed database that provides translation between a domain name and an IP address, which simplifies network design; supports client and server

Layer 3 routing

- **Static IPv4 routing:** provides simple, manually configured IPv4 routing

- **Routing Information Protocol (RIP):** uses a distance vector algorithm with UDP packets for route determination; supports RIPv1 and RIPv2 routing; includes loop protection
- **OSPF:** Interior Gateway Protocol (IGP) using link-state protocol for faster convergence; supports ECMP, NSSA, and MD5 authentication for increased security and graceful restart for faster failure recovery
- **Intermediate system to intermediate system (IS-IS):** Interior Gateway Protocol (IGP) using path-vector protocol, which is defined by the ISO organization for IS-IS routing and extended by IETF RFC 1195 to operate in both TCP/IP and the OSI reference model (Integrated IS-IS)
- **Border Gateway Protocol 4 (BGP-4):** Exterior Gateway Protocol (EGP) with path vector protocol uses TCP for enhanced reliability for the route discovery process, reduces bandwidth consumption by advertising only incremental updates, and supports extensive policies for increased flexibility, as well as scales to very large networks
- **Policy-based routing:** makes routing decisions based on policies set by the network administrator
- **IP performance optimization:** set of tools to optimize performance of IPv4 networks; includes directed broadcasts, customization of TCP parameters, support of ICMP error packets, and extensive display capabilities
- **Unicast Reverse Path Forwarding (uRPF):** is defined by RFC 3704 and limits erroneous or malicious traffic
- **Static IPv6 routing:** provides simple, manually configured IPv6 routing
- **Dual stack:** maintains separate stacks for IPv4 and IPv6 to ease transition from an IPv4-only network to an IPv6-only network design
- **Routing Information Protocol next generation (RIPng):** extends RIPv2 to support IPv6 addressing
- **OSPFv3:** extends OSPFv2 to support IPv6 addressing
- **IS-IS for IPv6:** extends IS-IS to support IPv6 addressing
- **BGP+:** extends BGP-4 to support Multiprotocol BGP (MBGP), including support for IPv6 addressing
- **IPv6 tunneling:** is an important element for the transition from IPv4 to IPv6; allows IPv6 packets to traverse IPv4-only networks by encapsulating the IPv6 packet into a standard IPv4 packet; supports manually configured, 6to4, and Intra-Site Automatic Tunnel Addressing Protocol (ISATAP) tunnels
- **Multiprotocol Label Switching (MPLS):** uses BGP to advertise routes across Label Switching Paths (LSPs), but uses simple labels to forward packets from any Layer 2 or Layer 3 protocol, thus reducing complexity and increasing performance; supports graceful restart for reduced failure impact; supports LSP tunneling and multilevel stacks
- **Multiprotocol Label Switching (MPLS) Layer 3 VPN:** allows Layer 3 VPNs across a provider network; uses MP-BGP to establish private routes for increased security; supports RFC 2547bis multiple autonomous system VPNs for added flexibility
- **Multiprotocol Label Switching (MPLS) Layer 2 VPN:** establishes simple Layer 2 point-to-point VPNs across a provider network using only MPLS LDPs; requires no routing and therefore decreases complexity, increases performance, and allows VPNs of non-routable protocols; uses no routing information for increased security; supports Circuit Cross Connect (CCC), Static Virtual Circuits (SVCs), Martini draft, and Kompella-draft technologies
- **Virtual Private LAN Service (VPLS):** establishes point-to-multipoint Layer 2 VPNs across a provider network
- **Service loopback:** allows any module to take advantage of higher featured modules, including OAA modules by redirecting traffic; reduces investment and enables higher bandwidth and load sharing; supported for IPv6, IPv6 multicast, tunneling, and MPLS

Security

- **Access control list (ACL):** supports powerful ACLs for both IPv4 and IPv6; ACLs are used for filtering traffic to prevent illegal users from accessing the network, or for controlling network traffic to save resources; rules can either deny or permit traffic to be forwarded; rules can be based on a Layer 2 header or a Layer 3 protocol header; rules can be set to operate on specific dates or times
- **RADIUS:** eases switch security access administration by using a password authentication server
- **TACACS+:** is an authentication tool using TCP with encryption of the full authentication request that provides added security
- **Switch management logon security:** can require either RADIUS or TACACS+ authentication for secure switch CLI logon
- **Secure Shell (SSHv2):** uses external servers to securely log in to a remote device; with authentication and encryption, it protects against IP spoofing and plain text password interception; increases the security of SFTP transfers
- **DHCP snooping:** ensures DHCP clients receive IP addresses from authorized DHCP servers and maintain a list of DHCP entries for trusted ports; prevents receiving fake IP addresses and reduces ARP attacks, improving security
- **IP source guard:** filters packets on a per-port basis to prevent illegal packets from being forwarded
- **ARP attack protection:** protects from attacks using a large number of ARP requests by using a host-specific, user-selectable threshold
- **Port security:** allows access only to specified MAC addresses, which can be learned or specified by the administrator
- **IEEE 802.1X:** provides port-based user authentication with support for Extensible Authentication Protocol (EAP) MD5, TLS, TTLS, and PEAP with choice of AES, TKIP, and static or dynamic WEP encryption for protecting wireless traffic between authenticated clients and the access point
- **MAC authentication:** provides simple authentication based on a user's MAC address; supports local or RADIUS-based authentication
- **Multiple user authentication methods:**
 - IEEE 802.1X: industry-standard method of user authentication using an IEEE 802.1X supplicant on the client in conjunction with a RADIUS server
 - Web-based authentication: similar to IEEE 802.1X, it provides a browser-based environment to authenticate clients that do not support the IEEE 802.1X supplicant
 - MAC-based authentication: client is authenticated with the RADIUS server based on the client's MAC address
- **DHCP protection:** blocks DHCP packets from unauthorized DHCP servers, preventing denial-of-service attacks
- **Endpoint Admission Defense (EAD):** provides security policies to users accessing a network
- **Port isolation:** secures and adds privacy, and prevents malicious attackers from obtaining user information

Convergence

- **LLDP-MED (Media Endpoint Discovery):** is a standard extension of LLDP that stores values for parameters such as QoS and VLAN to automatically configure network devices such as IP phones
- **Multicast Source Discovery Protocol (MSDP):** is used for inter-domain multicast applications, allowing multiple PIM-SM domains to interoperate
- **Internet Group Management Protocol (IGMP):** is used by IP hosts to establish and maintain multicast groups; supports v1, v2, and v3; utilizes Any-Source Multicast (ASM) or Source-Specific Multicast (SSM) to manage IPv4 multicast networks

- **Protocol Independent Multicast (PIM):** is used for IPv4 and IPv6 multicast applications; supports PIM dense mode (PIM-DM), sparse mode (PIM-SM), and source-specific mode (PIM-SSM)
- **Multicast Border Gateway Protocol (MBGP):** allows multicast traffic to be forwarded across BGP networks, separate from unicast traffic
- **Multicast Listener Discovery (MLD) protocol:** is used by IP hosts to establish and maintain multicast groups; supports v1 and v2 and utilizes Any-Source Multicast (ASM) or Source-Specific Multicast (SSM) to manage IPv6 multicast networks
- **Multicast VLAN:** allows multiple VLANs to receive the same IPv4 or IPv6 multicast traffic, reducing network bandwidth demand by eliminating multiple streams to each VLAN
- **Voice VLAN:** automatically assigns VLAN and priority for IP phones, simplifying network configuration and maintenance

Fixed Port L2 Managed Ethernet Switch (Edge Switches)

Features

Quality of Service (QoS)

- **IEEE 802.1p prioritization:** delivers data to devices based on the priority and type of traffic

Connectivity

- **10/100 and 10/100/1000 connectivity:** provides customers with the choice of selecting the network connectivity speed that best meets their needs, with a consistent user experience
- **Gigabit uplinks:**
 - four dual personality for 10/100/1000 or SFP ports for optional fiber connectivity such as Gigabit-SX, -LX, -LH, or 100-FX
- **Auto-MDIX:** automatically adjusts for straight-through or crossover cables on all 10/100 and 10/100/1000 copper ports

Resiliency and high availability

- **IEEE 802.1s Multiple Spanning Tree:** provides high link availability in multiple VLAN environments by allowing multiple spanning trees; provides legacy support for IEEE 802.1d and IEEE 802.1w
- **IEEE 802.3ad Link Aggregation Control Protocol (LACP) and trunking:**

Manageability

- **IEEE 802.1AB Link Layer Discovery Protocol (LLDP):** provides automated device discovery protocol for easy mapping by network management applications
- **RMON:** provides advanced monitoring and reporting capabilities for statistics, history, alarms, and events
- **Full-featured console:** provides complete control of the switch with a familiar command-line interface (CLI)
- **Web interface:** allows configuration of the switch from any Web browser on the network
- **Single IP Address Management:** provides single IP address management for a virtual stack of up to 16 switches
- **Find-Fix-Inform:** finds and fixes common network problems automatically, then informs administrator
- **Dual flash images:** provides independent primary and secondary operating system files for backup while upgrading
- **Software updates:** free downloads from the Web
- **Friendly port names:** allow assignment of descriptive names to ports

Layer 2 switching

- **VLAN support and tagging:** support up to 64 port-based VLANs and dynamic configuration of IEEE 802.1Q VLAN tagging, providing security between workgroups
- **GARP VLAN Registration Protocol:** allows automatic learning and dynamic assignment of VLANs
- **Jumbo packet support:** supports up to 9216-byte frame size to improve performance of large data transfers

Security

- **Protected ports:** provides increased security by allowing specified ports to be isolated from all other ports on the switch; the protected port or ports can only communicate with the uplinks or shared resources
- **Multiple user authentication methods:**
 - IEEE 802.1X: industry-standard method of user authentication using an IEEE 802.1X supplicant on the client in conjunction with a RADIUS server
 - Web-based authentication: similar to IEEE 802.1X, it provides a browser-based environment to authenticate clients that do not support the IEEE 802.1X supplicant
 - MAC-based authentication: client is authenticated with the RADIUS server based on the client's MAC address
- **Guest VLAN:** isolates guest and unauthorized users traffic to a separate VLAN
- **Port security:** allows access only to specified MAC addresses, which can be learned or specified by the administrator
- **MAC address lockout:** prevents particular configured MAC addresses from connecting to the network
- **Multiple IEEE 802.1X users per port:** provides authentication of up to two IEEE 802.1X users per port; prevents user "piggybacking" on another user's IEEE 802.1X authentication
- **STP BPDU port protection:** blocks Bridge Protocol Data Units (BPDUs) on ports that do not require BPDUs, preventing forged BPDU attacks
- **Secure management access:** securely encrypts all access methods (CLI, GUI, or MIB) through SSHv2, SSL, and/or SNMPv3
- **TACACS+:** eases switch management security administration by using a password authentication server

Convergence

- **IP multicast snooping:** automatically prevents flooding of IP multicast traffic

Annexure ‘G’
ITEM SET 21
Comprehensive AMC for Wireless Network in University Hostels

Following Hostels are connected to campus wide network of the University at IT centre through wireless link

1. **Kamala Nehru Girls Hostel** [Opp: Holkar college near University Guest House, A.B.Road, Indore]
2. **CVR Girls Hostel** [Opp: Holkar college near University Guest House, A.B.Road, Indore]
3. **Jawaharlal Nehru Boys Hostel** [Takshila Campus, near University Auditorium, Indore]
4. **JCB Hostel** [Asha Ram Bapu Square, Ring Road, Indore]
5. **RNT Hostel** [Asha Ram Bapu Square, Ring Road, Indore]
6. **Bapna Hostel** [Navlakha Square, opposite:T.V. Tower, Indore]
7. **Auditorium**[Takshila Campus, Indore]
8. **School of physical Education**[Takshila Campus, Indore]
9. **IET Department** [near Asha Ram Bapu Square ,Khandwar Road]

In each hostel network connectivity is distributed to all the students through Wi-fi facility. The site may be visited for further information.

ITEM SET 21**Comprehensive AMC for Wireless Network in University Hostels**

Please note that the following list of items is to give an idea of various devices being used at various locations(For further detail visit campus)

Sno.	Department /Hostel	Sector Antenna	Pannel Antenna	Grid Antenna	Back Fire	Router 2.4 /5 Ghz	Omni Antenna	Tower
1	IT Centre	4	1	1	1	7		60"
2	Bapna Hostel		1	1		1		40"
3	CVR Hostel		1	1		1		
4	KNGH Hostel			1		1	1	
5	JNBH Hostel			1		1	1	
6	Auditorium			1		1		
7	Sports			1		1		
8	IET Department			1		1		
9	IIPS Hostel			2		2	2	
10	IMS Hostel		2	1		3		
	Total :-	4	5	11	1	19	4	130"

S.No.	Item Description	No. of Quantity	To be given for AMC
1.	Wireless Router (Microtik Make)	19	19
2	Sector Antenna	4	4
3	Panel Antenna	5	5
4	Grid Antenna	11	11
4	Back Fire	1	1
6	Omni Antenna	4	4

ITEM SET 21**Comprehensive AMC for Wireless Network in University Hostels****Penalty Provisions:**

For Hardware equipments.

- Delay will be calculated from the date and time of registering the fault with the resident service engineer.
- Any fault should be attended immediately and must be set right within 24 hours. Failure to maintain above dead line would result in penalty charges as under:

If a service is not available for more than twenty four hours then penalty will be applicable.

Following are the details of penalty charges.

Service down for > 24 hours	Penalty Charges
Link Failure	Rs.2000/- per day
Hardware failure	Rs.2000/- per day

Signature _____

Date:

Name _____

In capacity of _____

Name of the organization & seal