Yearly Syllabus for Undergraduates
As recommended by Central Board of Studies of Computer Maintenance &
Approved by H E the Governor of Madhya Pradesh
Session 2017-18
JULY 2017 Onwards
Class- B.Sc (Computer Maintenance)

Paper Code		Internal			Theory	Total	Practical	Grand Total
	First Year	Three Months	Six Months	Total				
BSCCM11	Application & System Software				40			
BSCCM12	Programming & Problem Solving through C & C++	10	10	20	40	80		100
BSCCM13P	Practicals on BSCCM11 & BSCCM12						50	50
	Second Year							
BSCCM21	Computer Peripherals & Maintenance				40			
BSCCM22	Computer System Architecture	10	10	20	40	80		100
BSCCM23P	Practicals on BSCCM21 & BSCCM22						50	50
	Third Year							
BSCCM31	Computer Network Administration				40			
BSCCM32	Unix/Linux System Administration	10	10	20	40	80		100
BSCCM33P	Practicals on BSCCM31 & BSCCM32						50	50
							Grand Total	450

Remark: (i) Each theory paper contain five objective type question of 1 mark and
     (ii) Five short answer type question of 2 marks and
     (iii) Five long answer type question of 5 marks, with internal choice in (ii) and (iii)

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B.Sc. (Computer Maintenance) First Year
First Paper
Application &System Software

Maximum Marks: 40

Unit-I

Computer Fundamental: Computer software & its type, Operating system, user interfacing, system software- BIOS & driver programs, file system, Loader & linker, Compiler, assembler & Interpreter.

Unit-II

Disk Operating System (DOS): Need for DOS, MS-DOS commands: Internal & External commands, Hard disk partition using FDISK, Formatting, Application Software, Input/Output Devices. Computer Software: What is Software? Relationship between Hardware and Software, Logical System Architecture showing relationship between hardware, Types of Software: System Software, Application Software, Firmware, Functions of System Software, and Type of System Software: Operating Systems, Language Translators, Utility Programs, Communications Software. Application Software, Commonly Used Application Software: Word Processing.

Unit-III

Operating System: System software packages, function of operating system, processor management ,Memory management, Virtual storage, Devices management, information management, Job control language, GUI & CLI, operating system example.

Unit-IV

MS-Windows: Operating system-Definition & functions, basics of Windows. Basic components of Windows, icons, types of icons, taskbar, activating windows, using desktop, title bar, running applications, exploring computer, managing files and folders, copying and moving files and folders. Control panel – display properties, adding and removing software and hardware, setting date and time, screen saver and appearance. Using windows accessories.

Unit-V

Application Software Documentation Using MS-Word - Creating & Editing Document, Formatting Document, Advance Features of MS-Word-Mail Merge, Tables, Printing, Styles, linking and embedding object, Electronic Spread Sheet using MS-Excel - Introduction to MS-Excel, Creating & Editing Worksheet, Formatting and Essential Operations, Presentation using MS-PowerPoint: Presentations, Creating, Manipulating & Enhancing Slides.

TEXT BOOK:
1. "Fundamentals of Computers & Information Technology": A. Jaiswal, Dreamtech Press.

REFERENCE BOOKS:
1. Fundamentals of Information Technology Including MS-Office by Maidasani, Laxshmi Publication.
2. Comdex Computers Course Kit :Vikas Gupta, Dreamtech Press

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Instruction to Paper Setter: Question Paper should be framed in both English and Hindi version.

B.Sc. (Computer Maintenance) First Year
Second Paper
Programming & Problem Solving through C & C++

Maximum Marks: 40

Unit I

History of C, C Character Set, Keywords and Identifiers, Tokens , Basic Structure of C Program, Types of Constants, Data Types, Variables, Type Casting, Operators and Expressions, Input and Output Management in C. Control Statements: if, if...else, switch....case, while, do...while, for Loops, Nested Loops, break and continue, exit Statements and goto Statement, Functions: Definition, Library Functions User Defined Functions, Function Prototype, Function Definition, Function Call, Types of User Defined Functions.

Unit II

Arrays: Array Definition, One Dimensional Array, Two Dimensional Array, Arrays and Functions. String Handling: String Library Functions: strlen, strcat, strcmp, strcpy, strrev.
Pointer: Introduction to Pointer, Understanding Pointers, Declaring Pointer Variables, Pointer and Function (Call By Value and Call By Reference), Pointer and Arrays, Pointer and Strings, Pointer and Structure, Pointer to Pointer. Storage Class, Types of Storage Class, auto, register, static, extern.

Unit III

Procedure-Oriented Programming vs. Object-Oriented Programming, Basic concepts of OOPs, Advantages of OOPs, Object Oriented Languages. Introduction to C++, Structure of C++ program. Classes and Objects Specifying a Class, Defining Member Functions, Inline Functions, Default Arguments, Function Overloading, Friend and Virtual Functions. Private Member Functions, Arrays within a Class, Memory Allocation for Objects, Static Data Members, Static Member Functions, Array of Objects, Objects as Function Arguments, Returning Object Objects, Pointers to Members.

Unit IV

Constructors and Destructors Constructors, Parametric Constructors, Multiple Constructors in a Class, Constructors with Default Arguments, Dynamic Initialization of Objects, Copy Constructor, Dynamic Constructor, Destructors. Operator Overloading and Type Conversions Definition, Overloading Unary Operators, Binary Operators, Binary Operators using Friends, Rules for Overloading Operators. Inheritance Defining Derived Classes, Single Inheritance, Multilevel Inheritance, Multiple Inheritance, Hierarchical Inheritance, Hybrid Inheritance, Virtual Base Classes, abstract Classes. Inheritance Defining Derived Classes, Single Inheritance, Multilevel Inheritance, Multiple Inheritance, Hierarchical Inheritance, Hybrid Inheritance, Virtual Base Classes, Abstract Classes, Constructors in Derived Classes.

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Unit V

Pointers, Virtual Functions and Polymorphism Pointers to Objects, This Pointer, Pointers to Derived Classes, Virtual Functions, Pure Virtual Functions. Operations C++ Streams, C++ Stream Classes, Managing Output with Manipulators. Working with Files Classes for File Strewn Operations, Opening and Closing a File, Detecting EOF, File Pointers, Updating a File, Error Handling during File Operations.

Text Books:
1. E. Balagurusamy , " Programming in ANSI C",TMH,5th Ed., ISBN 0-07-068182-1
2. A first course in Programming with C, T. Jeypoovan
3. Object Oriented Programming with C++ By E.Balagurusamy, TMH.

References Books:
1. Programming in C++ By Robert Lafore.
2. ISRD-Object Oriented Programing with C++ , TMH
3. C++ the complete reference By Herbert Schildt, TMH
4. Mastering C++, Venugopal, TMH
5. Let Us C , Yashavant P. Kanetkar

Instruction to Paper Setter: Question Paper should be framed in both English and Hindi version.

Practical List:

1. A program to find simple and compound interest for the rate of interest.
2. A program to find corresponding temperature in Fahrenheit from a given temperature in Celsius.
3. A Program to accept decimal number and display equivalent number in Octal and Hexadecimal.
4. A program to swap the contents of two variables.
5. Program to accept the distance between two cities in kilometres and print the distance in meter, feet, inches and centimetre.
6. Program to accept the two sides and angle included by these two sides to find area and third side of a Triangle.
7. A program to check whether a given number is even or odd.
8. A program for check whether a given year is leap year.
9. A program to find largest among any five given numbers with minimum condition.
10. A program to find roots of Quadratic equation ax^2+bx+c.
11. A program to print all the prime number between 10 to 100.

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12. A Program to print multiplication Table of a number.
13. A program to print number, square and cube of the first 10 natural number.
14. A program to find the factorial of an integer number.
15. A program to generate and print Fibonacci sequence.
16. A program to find the GCD of two Positive integers by successive division.
17. A Program to find the number of Armstrong number between 123 to 425.
18. A program to print truth table from X* Y+Z.
19. A Program to generate a menu driven program using switch statement to 1) Add 2) Edit 3) Delete 4) Exit an element from a list of given n numbers stored in array..
20. A Program to find sum of two matrices having size m*n and p*q.
21. A Program to Transport the matrix of size M*N.
22. A Program to delete an element from list of N numbers.
23. A Program to find sum of each row and column of matrix and also find largest and smallest element in the given matrix.
24. A program to count number of characters including uppercase and lowercase letter, digits, punctuations, space and words that are entered in a given string.
25. A Program to accept the containing 10 number and pass it to function to print it.

Notes : Student must write/run 50 programmes on their practical file & Computer lab.

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B.Sc. (Computer Maintenance) Second Year
First Paper
Computer Peripherals & Maintenance

Maximum Marks: 40

Unit-I
Hardware Basics: Basic terms, concepts, and functions of system modules (System board, firmware, storage devices, monitor, boot process, ports). CMOS and BIOS, Overview of system components, Knowing mother board of PC, Identifying types of motherboard, Understanding BUS architecture. Switch Mode Power Supply (SMPS),precautions related to SMPS for Computer, Circuit diagrams and pin assignments, working of SMPS Input and load requirements, connecting a PC and peripherals to power supply. Power Supply Maintenance: Precautions related to taking SMPS out from Computer, and over voltage and over current protection.

Unit-II
Monitors: Display basics, Display adapter cards, VGA and super VGA, failure, trouble shooting and elimination, color monitors basic color theory, faults in color section. Monitor adjustments, size, brightness, focus etc., **Keyboards:** Study of keyboards, Interconnection to PC, Common faults and diagnostics, Parallel port, serial port, Joy stick, light pen. **Mouse:** Types and installation of mouse **Printers:** Types of printers (DMP, INKJET, LASER), Construction & Working of DMP, INKJET, LASER Printers, Connecting printers to computers.

Unit-III
Memories: Reading memory error messages, adding RAM, Tips on installing memory chips, **Disk structure:** Cylinders, heads, platters, tracks and sectors, structure of a disk. **Cluster Performance:** Access time, seek time, latency period, data transfer rates, and interleave factors, hard disk controllers. Types of interface controller and drives. **Hard disk software installation:** Physical formatting, partitioning, high level formatting, Hard disk installation

Unit-IV
Scanner: Working Principle and its types. CD-ROM drive:- CD drives mechanism installation of CD drive. Drive technologies: - CD-ROM: SCSI\CD-R, CD-RW, DVD-ROM. Working Principals, IDE controller card. **Modem:**, Fault Finding, Repairing, modem Circuit Diagram, Repairing MODEM.

Unit-V
Troubleshooting Procedures and Preventive Maintenance:
Identifying Troubleshooting Tools, Hardware tools, Diagnostic software, The Art of Troubleshooting, Troubleshooting basics, troubleshooting by visual Inspection, Preventative Maintenance, Using Preventative Maintenance Tools, Materials and equipment, Software utilities, Maintaining Environmental Controls, Ventilation and airflow, Humidity and liquids, Dirt and dust EMI, Power, UPS, and suppressors, Completing Maintenance Tasks, Case and components, Power supplies.

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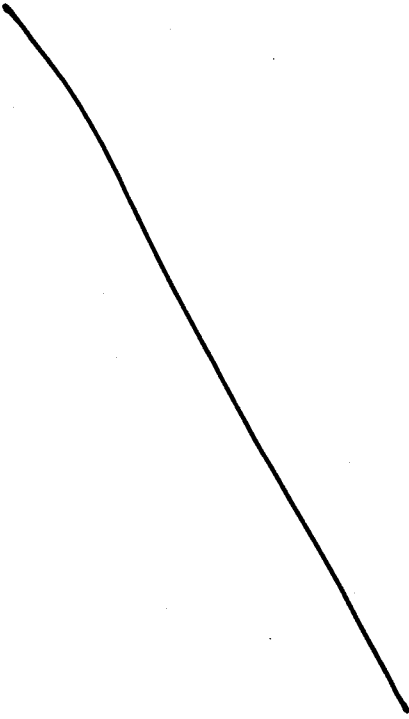**Session 2017-18 onwards**

TEXT BOOK

1. CompTIA A+ Certification All-in-One Desk Reference for Dummies by Glen Clarke

REFERENCE BOOKS

1. IBM PC & Clones: Hardware Trouble Shooting and Maintenance by B. Govindarajalu, Tata
2. McGraw Hill
3. Pc Upgrade & Repair Bible , Wiley India.
4. PC Systems, Installation and Maintenance, Second Edition by R. P. Beales,
5. PC Upgrade & Repair Black Book by Ron Gilster.

Instruction to Paper Setter: Question Paper should be framed in both English and Hindi version.

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B.Sc. (Computer Maintenance) Second Year
Second Paper
Computer System Architecture

Maximum Marks: 40

Unit-I
Basic Computer Design and Micro operations: Principles of Computer Design, classification of Computer architecture design, Register Transfer and Micro-operations, Register transfer language, Bus and memory transfer, Arithmetic, Logic & Shift micro-operation without hardware implementation, Instruction codes, Computer registers & instructions, Timing and control, Instruction cycle, Input-output and interrupt, Design of basic computer & Accumulator logic.

Unit-II
Micro-Programmed Control and Hard-Wired Control CPU: Control Memory, Address Sequence and Structure of Control Unit, Hardwired control, Micro program, Micro instruction, Micro Program sequencer. **Central Processing Unit:** Introduction, general register organization, Stack organization-register and memory stack, Instruction formats, Addressing modes, Data transfer and data manipulation instructions, Program control. Introduction to RISC and CISC family of micro processors.

Unit-III
Input-Output Organization: Input-Output Interface: I/O bus and interface module, I/O versus Memory Bus, Isolated and memory mapped I/O, Synchronous and Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt: Daisy chaining and Parallel Priority Interrupt, Priority Encoder, Interrupt Cycle. Direct Memory Access (DMA), Input-Output Processor (IOP), CPU and IOP communication.

Unit-IV
Memory Organization: Memory Hierarchy, RAM, ROM, Memory connection to CPU, Mapping, Auxiliary Memory, Associative Memory, Cache Memory and Mapping Techniques, Virtual Memory: Memory space and Address Space, Memory Page Table and Page Replacement, Memory Management Hardware.

Unit-V
Multiprocessor and Vector Processing: Parallel processing, Pipelining, Arithmetic and Instruction pipeline, Vector processing, Array Processor overview, Characteristics of Multiprocessor, Interconnection structure: Time shared common bus, Multiport Memory, Crossbar Switch, Multistage switching network, Hypercube Interconnection.

TEXT BOOK:
1. Computer System Architecture, by M.M. Mano, 3rd Edition, Prentice-Hall of India, 2002.

REFERENCE BOOK:
1. Computer Organization and Architecture: William Stallings, 6th edition, Pearson Education, 2002.
2. Structured Computer Organization: A.S.Tannenbaum, Prentice- Hall of India, 1999
3. Computer Architecture & Organization, Nicholas P. Carter, Schaum Series Outline, 2010,

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Practical List:

1. Study of Various components of mother board
2. Study of CMOS
3. Study of BIOS
4. Study of Switch Mode Power Supply (SMPS)
5. Installation of Mouse and Printer and related drivers
6. Study of Hard disk Partition using FDISK
7. Study of Repairing MODEM

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B.Sc. (Computer Maintenance) Third Year
First Paper
Computer Network Administration

Maximum Marks: 40

Unit - I

Understanding network: Introduction: Computer Network, Goals and Applications, Reference models – OSI and TCP/IP. LAN, MAN and WAN and topologies, LAN components – File server, Workstations, Network Adapter Cards. Connection Oriented and Connection less services, Switching Techniques – Circuit Switching, Packet Switching. Comparison between peer to peer and client server network, LAN Network features- file & printer sharing, application services, remote access, Gateways, network security, network hardware components overview- servers, hubs, routers, switches and connecting cables.

Unit – II

Understanding networking protocols- Multiple access protocols: CSMA Protocols; Collision-Free Protocols, Ethernet, Token Bus, Token Ring. FDDI, Understanding TCP and UDP, TCP and UDP ports, IP packets and IP addressing, IP subnets, subnet masks, Domain Name System (DNS), Dynamic host control protocol (DHCP), Hypertext Transfer Control Protocol (HTTP), File Transfer Protocol(FTP), Netnews transfer protocol (NNTP), Telnet, Simple Mail Transfer protocol (SMTP), Comparing important proprietary protocols-NOVELL's IPX/SPX, NetBIOS/NetBEUI protocols, TELNET, VOIP, AppleTalk,.

Unit-III

Internet addresses: Universal identifiers, three primary classes of IP addresses, Addresses specify network connections, Network and Broadcast addresses, Limited Broadcast, Weakness to internet addressing, Dotted decimal notation, Loopback address, Internets addressing authority, Network byte order. Mapping of network addresses to physical address, Mapping Internet addresses to physical addresses (ARP), Determining an Internet Address at Startup (RARP).

Unit-IV

Data Delivery: Addressing, Routing and multiplexing, The IP address, Internet routing architecture, The routing table, protocols, ports and sockets, The host tables, Configuring server, Bootstrap and Auto configuration (BOOTP, DHCP), Configuring DNS name service, Troubleshooting TCP/IP Problem, Diagnostics tools, Testing basic connectivity, Troubleshooting Network Access, Checking routing & name service, Network Management commands.

Unit - V

Network Administration: Managing user and computer accounts, enabling and disabling users, rights and permissions to user accounts, event logs, Network security- security planning, User authentication, application security, access control, encryption, Firewalls & its architecture details, Accessing services through firewall.

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Text Books:

1. TCP/IP Network Administration, By Craig Hunt, O'RE
2. Behrouz A. Forouzan, "Data communication and Networking", Tata McGraw-Hill, 2004.

Reference Books:
1. Internetworking with TCP/IP Volume 1, Douglas E. Comer, P
2. SAMS teach yourself TCP/IP, Joe Casad,
3. TCP/IP For Dummies, By Candace Leiden, Marshall Wilensky

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B.Sc. (Computer Maintenance) Third Year
Second Paper
Unix/Linux System Administration

Maximum Marks: 40

Unit-I

Basic Architecture of Unix/Linux system: Features of Kernel and Shell. Unix File system - Boot block, super block, Inode table, data blocks, How Unix/Linux kernel access files, Structure of Unix/Linux standard file system, Essential Linux commands - Commands for files and directories creating and viewing files using cat, cd, ls, cp, md, rm, mkdir, rmdir, pwd, file, more, less, file comparisons – cmp & comm, View files, disk related commands, checking disk free spaces, chmod with its options, cal, date,who, tty, lp,stty. Filters and pipes, head, tail , wc, pr, cut, paste, sort, uniqe, grep, egrep, fgrep ,tee.

Unit-II

Process : shell process, parent and children ,process status, system process, multiple jobs in background and foreground, changing process priority with nice, premature termination of process, Mathematical commands- bc, expr, factor, units. Creating and editing files with VI editor with their command options, Operators, text deletion, text movement, changing text, yanking text, filtering text, the ex mode, moving text from one file to another. Communication: The bulletin board –news, write, mesg, talk, mail, elm, pine, finger, vacation and connecting to remote machine.

Unit-III

Administration: Add and remove Users, Modify User Configuration, creating groups and delete groups, mounting and Unmounting file systems The Multi-User system, Common shell Usage. Connecting to Remote systems telnet, the tar command, Starting and stopping services, print spools and Queues, gzip, gunzip command, setting system name. **Configuration & installing Xfree86:** Installing Xfree86 manually, installing Xfree86 using script and Set up remote access.

Unit-IV

System Maintenance: Device Nodes, Making disk Partitions, Making a file system Backup and Restore. **LAN with Linux:** Choosing NIC, selecting boot protocol, static IP and DHCP, testing network, manual network configuration, configuring samba. Basic Network Services, Configure Network Services, configure internet Services, Check and Size Swap space, Manage printing, boot loader Lilo, grub, The Basic Configuration Files, Configuration of Access Rights. Install and Uninstall Modules

Unit-V

Connecting Linux to internet: PPP, PPP connection, point to point network, client server network, Linux File server, Linux print server, Linux. **Web Server:** Web server, Linux web server, installing Apache, configuring apache, managing web server, Mail serve, Firewall testing and troubleshooting, netstart command, ping, trace route commands, FTP.

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TEXT BOOKS:

1. Red Hat Enterprise Linux & Fedora Edition: The Complete Reference by Richard Peterson
2. Using Linux – David Bandel and napier – Pearson Education

REFERENCE BOOKS:

1. Professional Linux Kernel Architecture by Wolfgang Mauerer.
2. The Linux Networking Architecture by Klaus Wehrle.

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Practical List:

1. LAN & Linux Installation
2. Various components of LAN
3. Unix commands
4. Installation Xfree 86
5. Linux File Server, Print Server and Web Server Installation
6. Computer Assembling