

Babasaheb Bhimrao Ambedkar Bihar University, Muzaffarpur
Directorate of Distance Education
Professional / Technical 1st Semester (Session 2015-17)
Subject:- MCA
Paper – I
Model Paper (Full Marks – 70)
Information Technology

1. What is computer? Explain the characteristics of computers.
2. Briefly explain classification of the computer.
3. What is number system? Convert the following decimal number to base 2
(a) 122 (b) 198
4. Explain combinational circuits. Also explain SR and JK flip flop.
5. What are different essentials of the CPU? Compare CISC with RISC CPUs.
6. What is computer memory? Explain its types.
7. Explain the working of Bus connection. Also explain the features supported by PCI Bus.
8. Explain the working of hard drive with a neat diagram.
9. Write and explain the feature of mouse and trackball.
10. What is computer software? What are the uses of application software?
11. Write and explain software development process.
12. What is an operating system? Also explain functions of operating system.
13. What is data communication? Briefly explain various network types.
14. Explain TCP/IP protocols layers.
15. Write short notes on any two of the following
 - (a) Software Testing
 - (b) Distributed computer system
 - (c) Operating system components.

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Paper – II
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Computer Organization and Architecture

1. Define computer. Explain Von Neumann Architecture.
2. Write briefly about register. Also explain the register organization of 8085.
3. Discuss the different types of Bus. Explain the single Bus structure.
4. Discuss and explain the different categories of instructions.
5. Write the different formats of floating point numbers.
6. What do you mean the physical characteristics of DISK.
7. Discuss the working of I/O technology that does not require interrupts.
8. Write and explain different types of interrupts.
9. What is the instruction code? Discuss.
10. What are the functional requirements of a CPU? Discuss the significance of data path and control signal.
11. Explain the concept of pipelining. What are principles of linear pipelining?
12. Discuss and explain RISC and CISC.
13. Explain the replacement Algorithms.
14. Explain the calculation of effective address in core relative addressing modes.
15. Write short notes on any two of the following
 - (a) Memory Interleaving
 - (b) Direct Memory Access
 - (c) Indirect Addressing Mode.

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Paper – III
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Programming and data structure

1. Explain the basic structure of a C programming with an example.
2. Write and explain different types of operators used in C language.
3. Write a C program to print the multiplications table for any given number.
4. What is looping? Discuss and explain different types of looping statements used in C language.
5. Discuss switch () statement for multiple branching with suitable example.
6. What do you mean by functions? Also differentiate between function declaration and function definition?
7. Define recursion. When a program contains recursive function, function call is executed, how are the local variables within the recursive function interpreted.
8. Write a program to count the number of vowels and consonants in any given string.
9. What is pointer? Write a program that uses function to swap the data using pointer.
10. Write a function to sort the elements of an array of N numbers using pointer.
11. Define stack. Discuss the push and pop operation with example.
12. Explain the queue and also insert data at rear end with a suitable example.
13. What is list? Write a C program to create a singly linked list.
14. Define Tree. Explain Binary tree with its properties.
15. Write short notes on any two of the following
 - (a) Binary Search Tree
 - (b) Circular Linked List
 - (c) Define Graph

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Paper – IV
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Introduction to Management System

1. What is an organization? Explain.
2. Define MIS and its objectives. What are its characteristics?
3. Define Data Processing. What are the recent developments in database technology?
4. Explain information system. Also explain database models.
5. Define DSS. What are its characteristics?
6. What are grouping DSS? Explain.
7. What is a system? Explain various stages in SDLC.
8. Discuss and explain rapid application development.
9. What do you mean by Quality Information System?
10. Define expert system. What is the various application of expert system?
11. Briefly explain the neural network process.
12. Briefly explain various types of office automation system.
13. Write and explain the process model of the organization.
14. Write and explain the various steps of computer system design.
15. Short notes on any two
 - (a) Client Server Computing
 - (b) Transaction Processing System
 - (c) Define Prototyping

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Paper – V
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Mathematical Foundation

1. If A and B are two non empty set such that $A \times B = B \times A$, show that $A = B$.
2. Draw the truth table of conjunction, disjunction and Bi-conditional statements.
3. Evaluate $\lim_{n \rightarrow a} a_n$ when $f(x) = 2x^3 - x^4 + x^5$.
4. Find the derivation of $e^x \tan x$.
5. Define and explain Taylor's theorem.
6. Integrate $x^2 \sin x$ function with respect to x.
7. Evaluate $\int \sin^2 x \cos^4 x \, dx$
8. If $x^2 + y^2 = 25$ find $\frac{dy}{dx}$.
9. Discuss and explain vector addition with example.
10. Write and describe Green's Theorem.
11. Solve the system of equation using matrices

$$\begin{aligned}x + 2y - 2z &= 3 \\3x - y + 2z &= 2 \\2x - 2y + 3z &= 2\end{aligned}$$

12. Solve the question using determinants

$$\begin{aligned}a + b + z &= 6 \\a + 2b + 3c &= 14 \\-a + b - z &= -2\end{aligned}$$

13. Derive the De Moivre's Theorem.
14. Discuss and explain Cauchy's Theorem.
15. Write short notes on any two
 - (a) Differentiate $3a/4x^5$ with respect to x.
 - (b) Differentiate $\log (\tan e^x)$
 - (c) Differentiate $\log (2x + 3)$ from first principal.
