

(Please write your Exam Roll No.)

Exam Roll No

Bharati Vidyapeeth's
Institute of Computer Applications and Management
A-4, Paschim Vihar, New Delhi-63
Model Question Paper-I [Sem-I]

Paper Code: MCA - 101

Subject: Fundamentals of IT

Time: 3 Hours

Maximum Marks: 75

Note: Attempt FIVE questions in all. Question No. 1 is compulsory and attempt one question from each unit.

1. Answer all the following questions briefly:- 2.5 x 10 = 25
- (a) Define testing? What are its objectives?
 - (b) Discuss the term protocol? Explain the roles of FTP and HTTP.
 - (c) What technology is used by magnetic storage to store data?
 - (d) Compare a process and a thread.
 - (e) Discuss the roles of a dispatcher in Operating System.
 - (f) List advantages and drawbacks of network data model.
 - (g) Explain race condition.
 - (h) What is distributed computing? Write any one example of local application and global application.
 - (i) List different types of registers used by a microprocessor.
 - (j) Differentiate star and bus topology.

UNIT - I

2. (a) Convert the following : 6
- a. $12.52_{10} = ?_2$
 - b. $3.47_{10} = ?_{16}$
 - c. $1110.101_8 = ?_{10}$
 - d. $111001.11_2 = ?_{10}$
 - e. $456_{16} = ?_8$
 - f. $124.BC_{16} = ?_{10}$
- (b) Explain how the contents of a 4 bit register are loaded on the bus with the help of a neat diagram. 6.5
3. (a) Explain different types of instruction formats. 6
- (b) Explain why NAND and NOR gates are called Universal gates? And explain how the logic circuit of a 'minterm' expression can be drawn using NAND gates only? 6.5

UNIT - II

4. (a) "The rules of deciding the postage of a postal parcel is described as follows: if the parcel is to be sent by express, then the basic charge will be 6\$/kg, otherwise the basic charge will be 4\$/kg. If the distance is over 200km, then each kg will be charged for one more dollar. If the parcel's weight is over 10kg, then another 0.5 dollar will be charged for each kg that exceeds 10 kg". Suppose a parcel's weight is W kilograms, draw a decision table and decision tree to show the calculation of the postage for this parcel. 6.5
- (b) Draw a flowchart to print the sum of the series: 6

$$1 + 4 + 9 + \dots + n$$

5. (a) Compare features of waterfall and iterative waterfall model 6
 (b) Design an algorithm to calculate sum of digits of a n-digit number. 6.5

UNIT - III

6. (a) List different file allocation methods with their advantages and limitations. Also, show how linked allocation method is better than contiguous allocation, in terms of storage space utilization. 6
 (b) Describe three levels of schema in Database applications. 6.5
 7. (a) Explain the need of Process Intercommunication in Operating System? How processes communicate using direct and indirect communication methods? 6
 (b) Consider CPU reference string given below and count number of page faults using LFU scheme 6.5

Ref String: 1 2 5 4 3 5 2 1 3 4 2 5 1 4 3 2 5 3 1 1 2

Assume number of available frames: 4

UNIT - IV

8. (a) Show with the help of a diagram, how Amplitude and Frequency modulation are done. Also differentiate various modulation techniques. 6
 (b) Discuss the need of distributed computing? Explain the advantages and limitations of distributed systems. 6.5
 9. (a) Distinguish between circuit, packet and message switching techniques? 6
 (b) Explain the functions of routers and switches in detail. 6.5