2020

COMPUTER APPLICATION — MAJOR

Fifth Paper

Full Marks : 100

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Answer ***any five*** questions taking at least ***two*** from each **Group**.

Group - A

1. (a) Compare and contrast Mealy Machine and Moore Machine with example.

(b) Find the regular expression for the following set :

$L = \left\{ x \in \{a\}^x : |x| \text{is divided by 2 or 3} \right\}$ 8+12

2. Define NDFA. Construct the NDFA to accept any string over {0, 1} where number of 0's are odd and number of 1's are even. Test acceptability with 0101101. 5+10+5

3. State and explain the rules for removing epsilon-transition using a suitable example with at least 2 epsilon-transitions and at least 3-states. 10+10

4. (a) Explain Chomsky classification of grammar.

(b) Prove that G : S $\rightarrow$ SbS|a is ambiguous. 10+10

5. Define PDA. Construct the PDA to accept the language $L = 0^n1^n$. 6+14

6. Describe the different layers of OSI model along with their functionalities. 20

7. (a) Differentiate between ASK and FSK.

(b) Explain Nyquist Theorem and Shanon Capacity.

(c) What do you understand by Peer to Peer system? 8+7+5

8. What do you mean by line encoding? State and explain Manchester and Differential manchester encoding with the data 011010010. 4+8+8

9. (a) Compare and Contrast between Bus and Ring topology.

(b) Differentiate between Circuit Switching and Packet Switching.

(c) What is the functionality of UDP? 8+8+4

Please Turn Over

10. State and explain the concept of fixed delay path in Circuit Switch Network (CSN). How is the path established? State the advantages and disadvantages of CSN. 7+5+8

Group - B

11. What do you mean by test case? Generate the test cases for testing the function performing GCD of two numbers. Explain the requirement of each cases. 5+10+5

12. What do you mean by prototype? Explain the prototype model for software development. State some application of prototype model. 5+10+5

13. (a) Why is software maintenance required?

(b) Explain the importance of verification and validation.

(c) Why is spiral model difficult to implement? 8+8+4

14. (a) What are the properties of a good SRS?

(b) With example explain :

(i) Class Diagram

(ii) Interaction Diagram. 6+7+7

15. Write short notes on (***any two***) : 10×2

(a) Micro Development Process

(b) Logical and Physical DFD

(c) OOAD (Object Oriented Analysis and Design)

(d) Feasibility study.

16. (a) Discuss the features of Computer Ethics.

(b) Briefly discuss about the netiquette forms for business communication. 8+12

17. Write short notes on (***any two***) : 10+10

(a) Proof read

(b) Philosophical and professional ethics

(c) Cyber crime.

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