Avinashilingam Institute for Home Science and Higher Education for Women
(Deemed to be University), Coimbatore – 641 043

Master's Degree Examination – November 2018
Semester I

Class : I PG **Time: 3 hours**
Major : Information Technology **Max. Marks: 60**

17MITC01 MATHEMATICAL FOUNDATION FOR INFORMATION TECHNOLOGY

Part A **10 x 1/2 = 05**
Choose the correct Answer

1. A _____ is an ordered collection of objects.
   a) Relation b) Function c) Set d) Proposition

2. Power set of empty set has exactly _____ subset.
   a) One b) Two c) Zero d) Three

3. Regular grammar is _____.
   a) context free grammar b) non context free grammar
   c) english grammar d) none of the mentioned

4. Which of the following is not a regular expression?
   a) [(a+b)*-(aa+bb)]* b) [(0+1)-(0b+a1)*(a+b)]*
   c) (01+11+10)* d) (1+2+0)*(1+2)*

5. If L is DFA-regular, L' is
   a) Non regular b) DFA-regular
   c) Non-finite d) None of the above

6. Myphill Nerode does the following:
   a) Minimization of DFA b) Tells us exactly when a language is regular
   c) Both (a) and (b) d) None of the mentioned

7. CPM is _____.
   a) Critical Project Management b) Critical Path Management
   c) Critical Path Method d) Crash Project Method

8. Which of the following statements is not correct
   a) PERT is probabilistic in nature.
   b) CPM is probabilistic in nature.
   c) CPM and PERT use similar terminology but were developed independently
   d) All of these statements are correct

9. The strength (degree) of the correlation between a set of independent variables X and a dependent variable Y is measured by
   a) Coefficient of correlation b) coefficient of Determination
   c) Standard error of estimate d) all the above

10. The percent of total variation of the dependent variable Y explained by the set of independent variables X is measured by
   a) Coefficient of correlation b) Coefficient of Skewness
   c) Coefficient of Determination d) all the above

Part B **5 x 4 = 20**

Answer all the questions

Answer should not exceed 200 words or one page

11. a) Explain on Basic definition of Set theory.

(OR)

b) Define functions and types of functions.

12. a) Illustrate about the language of a Grammar.

(OR)

b) Explain on context free languages.

13. a) Explain on the informal view of Non-deterministic finite Automata.

(OR)

b) Describe equivalence of NFA and Regular languages.

14. a) Apply Critical Path Analysis.

(OR)

b) Sketch the advantages of Network Techniques.

15. a) Relate the difference between Correlation and Regression.

(OR)

b) Discuss about simple correlation and explain with example.

Part C **5 x 7 = 35**

Answer all the questions

Answer should not exceed 600 words or three pages

16. a) Examine relation and the types of relation?

(OR)

b) List out the Set Operation and Venn Diagrams.

17. a) Explain in detail about the types of phrase structure grammar.

(OR)

b) Build Context Free languages.

18. a) Analyze briefly about the Deterministic finite state Automata(DFA)

(OR)

b) Explain about the equivalence of DFA AND NFA in detail.

19. a) Compare the PERT AND CPM.

(OR)

b) Formulate the applications of Network Techniques, Limitations and Difficulties in using Network.

20. a) Evaluate in detail about Karl Pearson's Coefficient of correlation.

(OR)

b) Construct the Rank Correlation and Regression equations.

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