# GIET UNIVERSITY, GUNUPUR – 765022

RD19MTECH006

Registration No: | | | | | | | | | | |

Total Number of Pages : 02 M.TECH

AR-19

M.TECH 1ST SEMESTER EXAMINATIONS, NOV/DEC 2019

MATHEMATICAL FOUNDATION OF COMPUTER SCIENCE

Branch: CSE, MPCCS1010

Time: 3 Hours Max Marks : 70

The figures in the right hand margin indicate marks.

PART-A (10 X 2=20 MARKS)

1. Answer the following questions.

(a) Define Isomorphism of graphs.

(b) Define complement of a graph.

(c) Write the necessary conditions for isomorphism of two graphs.

(d) Define Euler circuit.

(e) Show that a connected multi graph has an Euler path but not Euler circuit if it has exactly two vertices of odd degree

(f) Define graph colouring.

(g) Explain about different types of errors.

(h) Find the Laurent Series of $\frac{\sinh 3z}{z^3}$ about the singular points

(i) Discuss the nature of singularity of $\frac{1}{\cos z - \sin z}$

(j) Define Harmonic function

PART-B (5 X 10=50 MARKS)

Answer any five questions from the following.

2

a) Let G be connected planner simple graph with e edges and v vertices. Let r be the number of regions in a planner representation of G. then show that $r = e - v + 2$

b) Calculate f(1.30) using the table given below

| X | 0.0 | 1.2 | 2.4 | 3.7 |
|---|---|---|---|---|
| f(x) | 3.41 | 2.68 | 1.37 | -1.18 |

3

a) Apply the maximum likelihood method to the Poisson distribution.

b) Define Laurent series of a function f(z)

4

a) Evaluate $\int_0^1 \frac{dZ}{1+X}$ using Simpson's one third rule with h=0.25

b) Prove that Binomial distribution is a Probability distribution.

5.

a) Apply the maximum likelihood method to the Normal distribution with $\mu$=0.

b) Find the probability of getting 17 heads in 35 flips of a balanced coin.

6

a) Find the regression line of X on Y in the points (2,12), (5,24), (9, 33), (14,50)

b)Evaluate $\int_0^{2x} \frac{d\theta}{5+4cos\theta}$

7

a) Evaluate the integral $\int_{-\infty}^{\infty} \frac{1}{(z^2+2)^2} dz$

b) Evaluate the integral $\int_{-\infty}^{\infty} \frac{1}{(x^2+4)(x^2+9)} dx$

8.

a) Define and explain Newton's forward difference interpolation formula.

b) Explain minimum spanning tree of graph by using Prim's algorithm.

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