GIET MAIN CAMPUS AUTONOMOUS,
GUNUPUR - 765022

Registration No: | | | | | | | | | | | **M.TECH**

Total Number of Pages : 1

M.TECH 1ST SEMESTER REGULAR EXAMINATIONS, DECEMBER 2018
MATHEMATICAL FOUNDATION OF COMPUTER SCIENCE
Branch: CS, Subject Code:MCSPC1010
(Regulations 2018)

Time: 3 Hours **Max Marks : 70** **Question Code: RD18002015**

PART-A (10 X 2=20 Marks)

1. Answer the following questions.

(a) Define Handshaking theorem of graphs.
(b) Define Bi-partite graph and give an example.
(c) Define DIRAC'S theorem of Hamilton graphs
(d) Find the probability of getting 7 heads in 15 flips of a balanced coin.
(e) What is rounding off error? Explain with an example.
(f) Define Newton's forward difference interpolation formula.
(g) Explain about different types of errors.
(h) Find the laurient Series of $\frac{\sin 3z}{z^3}$ 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) Verify whether the harmonic function is satisfied . If so find its conjugate harmonic v = $\tan^{-1}\frac{y}{x}$. [5]
b) Evaluate I = $\int Rez^2\, dz$, where 'c' is the boundary of square with vertices 0, 1,1+i,i .in clockwise. [5]

3.a) Apply the maximum likelihood method to the Poisson distribution. [5]
b) Define Laurent series of a function f(z) [5]

4.a) State and prove Cauchy's Integral theorem. [5]
b) Develop the function f(z) = sin z in a Taylor's series with centre $\frac{\pi}{2}$ [5]

5.a) Apply the maximum likelihood method to the Normal distribution with μ=0. [5]
b) Find the probability of getting 17 heads in 35 flips of a balanced coin. [5]

6. a) Solve the Integral $\int_{-\infty}^{\infty} \frac{1}{(x^2+4)(x^2+9))} dx$ [5]
b) Evaluate $\int_0^{2\pi} \frac{d\theta}{(2+\cos\theta)}$ [5]

7.a) Apply the maximum likelihood method to the Poisson distribution. [5]
b) Prove that Binomial distribution is a Probability distribution. [5]

8. a) Evaluate $\int_0^{\frac{\pi}{2}} \sin x dx$ by Simpson's one third rule with n=6. [5]
b) Calculate y(0.2),y(0.4) using RK method given that $\frac{dy}{dx} = \frac{y^2-x^2}{y^2+x^2}$ $y(0) = 1$ [5]

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