

**B.Tech. – VIEP – Computer Science & Engg.
(BTCSVI) / B. Tech. Electronics and
Communication Engg. (BTECVI) / B.Tech.
Electrical Engg. (BTELVI)**

Term-End Examination

December, 2015

BICE-007 : MATHEMATICS-III

Time : 3 hours

Maximum Marks : 70

Note : Attempt only two parts from each question. All questions carry equal marks.

1. (a) Show that $f(z) = \bar{z}$ is not analytic at any point in the complex plane.
- (b) Use Cauchy's integral formula to evaluate the integral .

$$\oint_C \frac{dz}{z(z^2 + 4)}, \quad |z| = 3.$$

- (c) Discuss the singularities of the function

$$f(z) = e^{1/z} + \frac{z}{z-1} + \frac{\sin z}{z}. \quad 7+7$$

2. (a) Discuss Moments, Skewness and Kurtosis.

- (b) Find the best fit $y = ax^b$ to the following data :

x :	50	70	100	120
y :	12	15	21	25

- (c) Find the probability of getting a king or a heart or a red card, if a card is drawn from a deck of 52 cards. 7+7

3. (a) Derive Poisson distribution as a limiting case of Binomial distribution.

- (b) In a sample of 1000 people in Delhi, 540 are rice eaters and the rest are wheat eaters. Can we assume that both rice and wheat are equally popular in Delhi at 1% level of significance ?

- (c) If X is a normal variate with mean 30 and S.D. 5, find the probabilities that

(i) $26 \leq X \leq 40$,

(ii) $|X - 30| > 5$. 7+7

4. (a) Using Regula-Falsi's method, find a real root of $\log x - \cos x = 0$, correct to four decimal places.

- (b) Show that Newton-Raphson's method has quadratic convergence.

- (c) Find Lagrange's interpolating polynomial for (0, 2), (1, 3), (2, 12) and (5, 147). 7+7

5. (a) Use Crout's method to solve

$$x + 2y + 3z = 1, 3x + y + z = 0, 2x + y + z = 0.$$

(b) Evaluate $\int_0^1 \frac{1}{1+x^2} dx$ by using Simpson's $1/3^{\text{rd}}$ rule.

(c) Apply Runge-Kutta's method of fourth order to determine $y(0.3)$ from

$$\frac{dy}{dx} = xy + y^2, y(0) = 1.$$

Take step size $h = 0.1$.

7+7
