

**B.Tech. - VIEP - Computer Science & Engg.
(BTCSEVI) / B.Tech. Electronics and
Communication Engg. (BTECVI) / B.Tech.
Electrical Engg. (BTLEVI)**

Term-End Examination

00363

December, 2016

BICE-007 : MATHEMATICS-III

Time : 3 hours

Maximum Marks : 70

Note : All questions are **compulsory**. Use of scientific calculator is permitted.

1. Answer **all** of the following : 2×7=14

(a) Determine the analytic function whose real part is $e^x[(x^2 - y^2) \cos y - 2xy \sin y]$.

(b) Evaluate $\oint_C \frac{3z^2 + z}{z^2 - 1} dz$, where $C : |z - 1| = 1$.

2. Answer any **two** of the following : 2×7=14

(a) The first four moments of a distribution about the value 4 of the variable are -1.5, 17, -30 and 108. Find the moments about the origin. State whether the distribution is leptokurtic or platykurtic.

- (b) In a partially destroyed laboratory record for analysing correlation data, the following results are left :

Variance $x = 9$,

Regression lines are $8x - 10y + 66 = 0$,

$$40x - 18y = 214.$$

Determine from the above information

- (i) the mean values of x and y , and
 - (ii) the coefficient of correlation between x and y .
- (c) A survey was conducted to find the supplies of the consumer durables for the market. It was found that the three major companies A, B and C have market share of 35%, 25% and 40% respectively out of which 2%, 1% and 3% are not up to the satisfaction. A consumer buys a product and is dissatisfied with it. What is the probability that it is from the company C ?

3. Answer any *two* of the following :

$$2 \times 7 = 14$$

- (a) Compute the variance of the probability of the number of doublets in four throws of a pair of dice.

(b) A manufacturer knows that the condensers, he makes contain on an average 1% defectives. He packs them in boxes of 100. What is the probability that a box selected at random will contain 3 or more defective condensers ?

(c) A sample of 100 dry cells tested to find the length of life, produced the following results :

$$\bar{x} = 12 \text{ hours}, \sigma = 3 \text{ hours.}$$

Assuming the data to be normally distributed, what percentage of the cells are expected to have life

- (i) more than 15 hours ?
- (ii) less than 6 hours ?
- (iii) between 10 and 14 hours ?

4. Answer any *two* of the following : $2 \times 7 = 14$

(a) By using Bisection method, find the root of the equation $xe^x = 1$ up to three decimal places.

(b) Find a root of the following equation using the Regula-Falsi method, correct to three decimal places :

$$x^3 - 2x - 5 = 0$$

(c) By Newton-Raphson method, solve the following equation and find the real root :

$$x \sin x + \cos x = 0$$

5. Answer any *two* of the following :

2×7=14

- (a) Solve the following equations by Gauss-Seidel method :

$$2x + y + 4z = 7$$

$$3x + y + 2z = 6$$

$$-x + 4y + 2z = 5.$$

- (b) The velocity of a car which starts initially from rest at intervals of 2 minutes, is given as :

Time (minutes)	Velocity (km/hr)
2	22
4	30
6	27
8	18
10	7
12	0

Apply Simpson's 3/8 rule to find the distance covered by the car.

- (c) Given that $\frac{dy}{dx} = 1 + xy$, $y(0) = 2$. Use Runge-Kutta fourth order method to find $y(0.1)$, $y(0.2)$.
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