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Total No. of Questions : 09]

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Paper ID [A0109]

(Please fill this Paper ID in OMR Sheet)

B.Tech. (Sem. - 1st/2nd)

MATHEMATICS - II (AMA - 102)

Time : 03 Hours

Maximum Marks : 60

Instruction to Candidates:

- 1) Section - A is **Compulsory**.
- 2) Attempt any **Five** questions from Section - B & C.
- 3) Select at least **Two** questions from Section - B & C.

Section - A

Q1)

(2 marks each)

- a) Define orthogonal matrix.
- b) State Cayley's Hamilton theorem.
- c) What is probability distribution?
- d) State Stoke's theorem.
- e) Define conditional probability.
- f) What is level of significance?
- g) What do you mean by degree of freedom?
- h) What is Exact differential equation?
- i) What is Clairaut's equations?
- j) What is Bernoulli's equation?

Section - B

(8 marks each)

- Q2) If the probability of a bad reaction from a certain injection is 0.001. Determine the chance that out of 2000 individuals more than two will get a bad reaction.

Q3) Write short note on the following :

- (a) Eigen values and eigen vectors.
- (b) Poission distribution.

Q4) Write all the properties of Normal distribution.

Q5) Verify Cayley's Hamilton theorem for the following matrix.

$$A = \begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$$

Section - C

(8 marks each)

Q6) Solve $(px - y)(py + x) = 2p$

Q7) Explain Chi-Square test as a test of goodness of fit.

Q8) Explain the following :

- (a) Bessel's formula.
- (b) Lagrange's interpolation formula.

Q9) A pendulum oscillating seconds at one place is taken to another place where it losses two seconds per day. Compare the acceleration due to gravity at the two places.