

Total No. of Questions : 12]

SEAT No. :

P2927

[Total No. of Pages : 3

[5463] - 105

F.Y. M.C.A. (Engg.) (Semester - I)

PROBABILITY & STATISTICS

(2013 Pattern)

Time :3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Neat diagrams must be drawn wherever necessary.
- 2) Figures to the right side indicate full marks.
- 3) Assume Suitable data if necessary

- Q1)** a) State and prove Baye's theorem [5]
b) A textile mill produce clothes in 3 different shades blue, brown and black. Production of these shades in 30%, 20% and 50% respectively of the total output. It is found from experience that 2%, 3%, 4% of blue, black and brown shades are defective. In entire production a specimen is selected and found to be defective. Find the probability that it is in black shade [4]

OR

- Q2)** a) What is event? Explain: [6]
i) Mutually Exclusive Events
ii) Impossible Events
iii) Compliment Events
b) What is the difference between permutation and combination [3]

- Q3)** a) Obtain probability distribution of no.s appearing on uppermost face when 2 dice are rolled simultaneously. [4]
b) Heights of the dogs are 600 mm, 470 mm, 170 mm, 430 mm and 300 mm. Find the mean, variance and standard deviation [4]

OR

- Q4)** a) A boy rolling a die. Calculate the probability of getting 3 on the 6th roll [4]
b) No. of road accidents on a highway during a month follows a Poission distribution with mean 5. Find the probability that in a certain month no. of accidents on the high way will be. [4]
i) <3
ii) between 3 & 5
iii) >3

P.T.O.

- Q5) a)** Obtain mean and variance of Uniform distribution. [4]
- b)** Let (X, Y) be a discrete bivariate random variable with the following p.m.f. [4]

Y \ X	1	2	3
1	$1/12$	$1/6$	0
2	0	$1/9$	$1/15$
3	$1/18$	$1/4$	$2/15$

Find marginal and conditional probability mass distribution for X and Y.

OR

- Q6) a)** Determine the constant b such that a joint p.d.f. of bivariate random variables X and Y is given by: [4]

$$3xy \text{ for } 0 < x < 1, 0 < y < b$$

$$f(x, y) = 0 \text{ otherwise}$$

- b)** Explain the following probability distributions with suitable examples [4]
- Poisson Distribution
 - Normal Distribution

- Q7) a)** What is point estimator and point estimate? What properties of estimator make it a good estimator? [4]

- b)** Explain the following terms: [4]

- Sample
- Sampling
- Random Sampling
- Sample Statistics.

OR

- Q8) a)** Explain the following terms: [4]

- Confidence Interval
- Central Limit Theorem

- b)** Explain Central Limit Theorem [4]

- Q9) a)** What is hypothesis testing? Explain the procedure for testing the hypothesis [4]

- b)** What is P value of test? How do we compute P value for two tailed test? [4]

OR

Q10)a) What is significance testing? How does it differ from hypothesis testing? [4]

b) Explain the terms: [4]

i) Interval estimate

ii) Unbiased estimate

iii) Efficient estimate

iv) Confidence Limit

Q11)a) Write a note on Statistical Quality Control (SQC) [5]

b) Explain the procedure to draw the mean chart [4]

OR

Q12)a) Explain in brief X^2 test as a test of goodness of fit [5]

b) Write note on range chart [4]

