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B.COM. (HONOURS) PART- III TEST EXAMINATION, 2017.

SUB.: - ADVANCED BUSINESS MATHEMATICS & STATISTICS

PAPER - VIII

F.M. -50 TIME: 2 HOURS

1. Answer any five (5) questions- 2X5=10

(a) Given A= $\begin{bmatrix} 4 & 2 & -1 \\ 3 & -7 & 1 \end{bmatrix}$ and B=$\begin{bmatrix} 2 & 3 \\ -3 & 0 \\ -1 & 5 \end{bmatrix}$, find AB.

(b) Evaluate $\lim_{x\to 2}\left(\frac{x^5-32}{x-2}\right)^n$

(c) Write down 'mean' and 'variance' of a binomial distribution.

(d) Find $\frac{dy}{dx}$ when $(x^2+y^2) = a^2$

(e) Distinguish between 'population' and 'sample'

(f) Evaluate $\int \frac{(1-x)^3}{x}\,dx$

(g) If A={1,3,5,9} and B={1,2,3,4,5,6,7,8}, find (A ∩ B)

(h) State Whether $0 \le P(A) \le 1$ is correct or not ;
What is the significance of P (A) = 1 ?

2. Answer any two (2) questions- 10X2=20

(a) Prove that the matrix A given by A= $\begin{matrix} a & b \\ c & c \end{matrix}$

satisfies the relation $A^2 - A(a + d) + (ad - bc)I = 0$, where I is a unit matrix of order two.

(b) If $\sqrt{1-x^2}+\sqrt{1-y^2}=a(x - y)$, show that $\frac{dy}{dx}=\sqrt{\frac{1-y^2}{1-x^2}}$

(c) (i) Find the area bounded by the parabolas
$y^2=16x$ and $x^2=16y$.

(ii) Evaluate the following integrals by the method of substitution:

$$\int \frac{x^2-1}{x}.e\quad dx$$

(d)Examine the maximum and minimum of $f(x)= x^3+12x^2+36x+8$

3. Answer any two (2) questions- 10X2=20

a. From a pack of 52 cards, 1 card is drawn at random. Find the chance of (i) drawing a spade, and (ii) not drawing a spade.

b. For any events A and B, which are not mutually exclusive, prove that
$P(A \cup B) = P(A)+P(B)-P(A\cap B)$.

c. A sample of 100 dry battery cells tested to find the length of life produced the following results $\bar{x}$=12 hours, =3 hours, Assuming that the data are normally distributed, what percentage of batter cells are expected to have life (i) more than 15 hours, (ii) Lasthan 6 hours and (iii) between 10 and 14 hours.

d. (i) What are the different types of sampling?
(ii) Mention two important properties of Poisson distribution.

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