

2018

**MCA 1st Semester (Supple.) Examination**

**PROBABILITY & STATISTICS**

**PAPER—MCA-105**

*Full Marks : 100*

*Time : 3 Hours*

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words as far as practicable.*

*Illustrate the answers wherever necessary.*

*All questions are of equal values.*

*Answer any five questions.*

1. (a) If A and B are two independent event. Calculate  $P(A + B)$  when  $P(A) = 0.37$  and  $P(B) = 0.48$ .

(b) If  $P(A) = \frac{1}{2}$ ,  $P(B) = \frac{1}{3}$ ,  $P(AB) = \frac{1}{4}$  obtain the values of  $P(A + B)$ ,  $P(AB')$ ,  $P(A' + B')$ .

7+7

*(Turn Over)*

2. State and prove Baye's theorem. 4+10

3. Two dice are thrown at a time. Write down it's sample space.  
Also find the probability that

(i) There will be a double 'SIX'.

(ii) There will be 'NO SIX'.

(iii) There will be at least one SIX. 2+4+4+4

4. (a) For any two events A and B. Prove that  $P(AB) \leq P(A + B)$ .

(b) If A and B be any two events then prove that

(i)  $P(A) = P(AB) + P(\overline{AB})$

(ii)  $P(\overline{AB}) = 1 - P(A) - P(B) + P(AB)$ . 7+7

5. (a) Find the Mean, Medium, Mode of the following distribution :

Daily Wages	20-30	30-40	40-50	50-60	60-70
No. of Labour	3	5	20	10	5

(b) If the arithmetic mean of 13, 15, 16, 12 x and y and that of 13, 15, 16, 12, x, y be x then find the value of x and y.

3×3+6

6. (a) Given  $\Sigma X = 56$ ,  $\Sigma Y = 40$ ,  $\Sigma X^2 = 524$ ,  $\Sigma Y^2 = 256$ ,  
 $\Sigma XY = 364$ ,  $n = 8$  find

(i) The Correlation Coefficient.

(ii) The Regression equation of X and Y.

- (b) Define Standard Deviation.

(5+5)+4

7. (a) Fit a state line of the following points :

X	0	1	2	3	4
Y	1	1.8	3.3	4.5	6.3

- (b) If  $\theta$  be the acute angle between the two regression lines then

$$\tan \theta = \frac{1-r^2}{r} \cdot \frac{S_x \cdot S_y}{S_x^2 + S_y^2}$$

where 'r' is the correlation coefficient of the variable  
 x and y. 7+7

8. An integer is chosen at random from the first 100 positive integers. What is the probability that the numbers chosen is divisible by 3 or 4. 14

9. An unit contain 6 red and 4 black balls. Two balls are drawn at random. Find the probability that
- (i) Both balls drawn are red
  - (ii) One ball is red and the other ball is black. 14

[ *Internal Assessment : 30* ]

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