

# HERAMB COACHING CLASSES

**XI/ MATHEMATICS**

**Marks:50**

**Duration:2Hour**

**Date:23/03/18**

**ATTEMPT ANY FIVE:**

**Q.1 Attempt any three:**

**(10)**

(a) Two dice are thrown together. What is the probability that sum of the number on uppermost faces is 5 or number on the second die is greater than the number on the first die.

(b) A fair coin toss four times find the probability that we will get two heads and two tails.

(c) If  $P(A) = \frac{1}{3}$ ,  $P(B) = \frac{2}{5}$ ,  $P(A \cup B) = \frac{8}{15}$ , find  $P(A|B)$  and  $P(B|A)$

(d) Define the following (i) impossible event (ii) sure event (iii) mutually exclusive event (iv) exhaustive event.

**Q.2 Attempt any three:**

**(10)**

(a) How many 3 digit numbers can be formed from the digits 0,2,4,5,7 if the repetition is (i) allowed (ii) not allowed.

(b) In how many ways can the letters of the word STORY be arranged if (i) T and Y are always together (ii) T is always next to Y.

(c) In how many ways can a team of 3 boys and 2 girls be selected from 6 boys and 5 girls.

(d) In how many ways can 5 students be selected out of 11, if (i) 2 particular students are include (ii) 2 particular students are not include.

**Q.3 Attempt any three:**

**(10)**

(a)  $\lim_{x \rightarrow a} \frac{x^7 - a^7}{x^{11} - a^{11}}$  (b)  $\lim_{x \rightarrow 2} \frac{3x^2 - x - 5}{x^2 + x - 6}$  (c)  $\lim_{x \rightarrow 0} \frac{\cos 4x - \cos 8x}{x \tan x}$  (d)  $\lim_{x \rightarrow 0} \frac{4^x - 3^x}{5^x - 1}$

**Q.4 Attempt any three**

(a) differentiate  $x \sec x \tan x$

(b) The total cost of producing  $x$  items is given by  $C = x^2 + 4x + 4$ . Find the average cost and the marginal cost. What is the marginal cost when  $x = 7$ ?

(c) Differentiate  $\frac{3x^2 - 4}{x + 5}$

(d) Differentiate  $e^{\cos x} \operatorname{cosec} x$

**Q.5 Attempt any three:****(10)**

(a) Calculate Walsch's Price Index Number

Commodity	Base Year		Current Year	
	Price	Quantity	Price	Quantity
L	4	16	3	9
M	6	16	2	4
N	8	28	7	7

(b)  $\sum p_0q_0=140$ ,  $\sum p_0q_1=200$ ,  $\sum p_1q_0=350$  and  $\sum p_1q_1=460$ ,

Find Laspeyres, Paasche's, Drobish-Bowley's and Marshall Edgeworth's Price Index Numbers.

(c) Find  $x$ , if Laspeyres's Price Index Number is equal to Paasche's Price Index Number.

Commodity	Base Year		Current Year	
	Price	Quantity	Price	Quantity
A	2	10	2	5
B	2	5	$x$	2

(d) Find  $x$ , if cost of living index is 150.

Group	Food	Clothing	Fuel & lighting	House Rent	Miscellaneous
I	180	120	300	100	160
W	4	5	6	$x$	3

**Q.6 Attempt any three:****(10)**

(a) Solve the equation using Cramer's rule

$$2x - y + 3z = 9, x + y + z = 6 \text{ and } x - y + z = 2.$$

(b) Without expanding the determinants, show that

$$\begin{vmatrix} lp & mq & nr & l & m & n \\ p^2 & q^2 & r^2 & p & q & r \\ 1 & 1 & 1 & qr & pr & pq \end{vmatrix} = 0$$

(c) Find  $k$ , if the area of the triangle with vertices  $A(k,3)$ ,  $B(-5,7)$ ,  $C(-1,4)$  is 4sq. units.(d) Find the equation of the line joining the points  $P(2,-3)$  and  $Q(-4, 1)$  using determinants.