Professor Vishwanathan Iyer's

HERAMB COACHING CLASSES

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FYBCOM / MATHS / DATE: 18.04.2019   **MARKS: 100**   **DURATION: 3HOURS**

NOTE: 1) All question are compulsory.

   2) In each question attempt any four sub questions out of the given five sub-question.

   3) Each question carries 20 marks. Each sub-question carries 5 marks.

   4) Use of simple calculator is allowed.

   5) Use of scientific calculator, digital diary or a phone is NOT allowed.

   6) Graphs must be drawn on the graph paper provided.

SECTION I

1. Attempt any four from (A), (B), (C), (D) and (E):   **(20)**

(A) Find the derivatives of Y with respect to x:

   i. $y = 6(x^2) + \log 90 + 2$

(B) The total revenue R for quantity D is given by R= 100D-D^2 . Find the total revenue, the average revenue and the marginal revenue where D=10.

(C) The total cost function is given by $C = x^2 - 10x + 525$. Find x for which the cost is minimum. Also find the minimum total cost.

(D) Find the elasticity of demand for the demand function $p = 80 - D^2$ when D=2.

(E)The demand function and the supply function for a commodity are given by $D = 400 - p^2$ and $S = 100 + 2p^2$ respectively. Find the rate of change in demand with respect to price at the equilibrium price.

2. Attempt any four from (A), (B), (C), (D) and (E):   **(20)**

(A) Find the compound interest and the accumulated amount after four year of principal sum of Rs.20,000 at 8% p.a.

(B) Mr. Khanna needs Rs.40,00,000 for his new business after 3 years. He wishes to put aside some money now in a bank giving 9% compound interest p.a., so that after 3 years he would getb the required amount. How much should he put aside now?

(C) What sum should be set aside at the end of each year for the 4 years, at 10% p.a. compound interest, to replace a machinery which is expected to cost Rs.50,00,000 at that time?

(D) Find the present value of an immediate annuity of Rs.10,000 per year for 3 years with interest compounded at 6% p.a.

(E) A loan of Rs.30,000 is to be returned in 4 monthly instalment at the rate of 12% p.a. compounded monthly. Find the EMI using the reducing balance method.

SECTION II

3. Attempt any four from (A), (B), (C), (D) and (E):   **(20)**

(A) If the rank correlation coefficient is 2/3 and $\sum d^2 = 55$, then find the number of pairs of observations (assume that no rank is repeated)

(B) Given that means of two variable X and Y are 6 and 8 and their variance are 25 and 169 and coefficient of correlation is 0.53 find likely value of y when x= 102.

(C) Calculate product moment correlation coefficient from the following data:

X	6	2	10	4	8
y	9	11	5	8	7

(D) The regression equation of y on x is 10y-9x=-40 and regression equation x on y is 10x-4y=8. Find

1) $\bar{x}$ and $\bar{y}$

2) Correlation coefficient (r)

X	1	2	3	4	5
y	2	5	3	8	7

(E) Define the regression why there are two regression lines? Under what condition can there will be only one regression line?

4. Attempt any four from (A), (B), (C), (D) and (E):   (20)

(A) Compute the seasonal indices from the following data using simple average method.

Year	Quarter			
	I	II	III	IV
2005	55	53	57	51
2006	56	55	60	53
2007	57	56	61	54

(B) Construct index number by weighted average method:

Commodity	Price		Weight
	2000	2001	
A	200	285	12
B	1600	2000	4
C	800	800	8
D	520	540	6

(C) Find the three yearly moving average from the following data.

Year	2002	2003	2004	2005	2006	2007	2008
Productions	19	24	25	21	24	26	25

(D) Find the fishers index number from the following data.

Commodity	Current year		Base year	
	Price	Quantity	Price	Quantity
A	3	30	2	20
B	5	20	4	15
C	6	50	3	40

(E) What is seasonal variation? Explain briefly with examples.

5. Attempt any four from (A), (B), (C), (D) and (E): (20)

(A) A students calculate mean as 5 and variance as a 9 for a binomial distribution. Is his calculation correct? Justify.

(B) If x has a poisson distribution with a parameter m such that P[x=3]=P[x=4]. Find $P[x \geq 3]$. $[e = 0.0183]$

(C) If random variable X~N(4.25) then find $P[x \leq 4]$.

(D) The company having 5000 workers whose wage distributed normally with average wage R.800 with S.D. of wageRs.200 find the no. of workers getting wages above 1000. (area between Z=0 and Z=1 is 0.3413].

(E) Write the p.m.f of binomial distribution and its properties.

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