FYBCom Sem-II OP3ACD Maths & Statst 17/B/2016

TOTAL MARKS:- 75 **DURATION:- 2½ HOURS**

INSTRUCTIONS:- 1) All the questions are compulsory.

2) Answer both the sections on the same answer-book.

3) Use of simple nonprogrammable calculator is allowed.

4) Graph papers will be provided on request.

SECTION-I

Q.1) Attempt **any three** from the following:

A) The total cost of a firm is Rs.50,000, when there is no production & Rs.1,00,000, when the output is 2500 units. If the total cost function is linear, find its formula. (5)

B) Find the derivatives of the following functions:- (5)

(i) $y = x^3.\log x$ (ii) $y = \frac{4^x+3}{x^4}$

C) Find x, for which the total revenue function $R = 4x^3-72x^2+420x+7000$ is maximum. (5)

D) If the demand function is $D= 100-2p-3p^2$ where D is demand & p is price, find the elasticity of demand at p=2. (5)

Q.2) Attempt **any three** from the following:

A) Akshay borrowed Rs.70000, partly at 9% p.a. & the remaining at 10% p.a. After 3 years, he returned the total amount, with a total simple interest of Rs.19800. Find the amounts he borrowed at each of these rates. (5)

B) The simple interest at 10% p.a. for 4 years on a certain sum is Rs.800. Find the compound interest on the same sum, at the same rate & for the same period. (5)

C) Ramesh deposited Rs.2000 per month in a recurring deposit that earns the interest of 12% p.a. compounded monthly. How much amount he received at the end of the year? (5)

D) Machinary costing Rs. 1,20,000 is purchased for Rs.20000 down payment & the balance in 4 equal half yearly installments with compound interest 6% p.a. compounded half yearly. Find the amount of each installment. (5)

SECTION-II

Q.3) Attempt **any three** from the following:

A) From the following data, calculate Karl Pearson's correlation coefficient (5)

x	18	15	17	16	12	14	19	20
y	15	16	14	17	15	11	18	19

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B) Calculate Spearman's rank correlation coefficient for the following data. (5)

X	67	65	58	59	63	65	72	65
Y	55	61	63	60	58	62	53	58

C) From the following data, find the two regression equations & estimate x when y = 50 & y when x = 63. (5)
Mean of x = 65, mean of y = 53, standard deviation of x = 4.7, standard deviation of y = 5.2 & correlation coefficient = 0.78.

D) Given the two regression equations $4x - y - 23 = 0$ & $3x - 2y + 4 = 0$. Find the mean values of x & y & the correlation coefficient. (5)

Q.4) Attempt **any three** from the following:

A) Calculate 5 yearly moving averages from the following time series. Also plot the given data and the moving averages on a graph paper. (5)

Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Sales	47	55	57	62	62	63	65	68	72	75

B) Fit a straight line trend by the method of least squares & estimate the trend for the year 2013. (5)

Year	2005	2006	2007	2008	2009	2010	2011
Assets	45	49	51	50	52	53	50

C) Calculate Laspeyre's, Paasche's and Fisher's Index Number from the following data (5)

Commodities	Base Year		Current Year	
	Price	Quantity	Price	Quantity
A	15	6	18	8
B	28	5	30	8
C	22	10	25	12
D	18	8	18	10

D) Find the cost of living index number for the following data by family budget method. (5)

Groups	Index number	Weights
Food	120	60
Clothing	187.5	5
Fuel	250	10
Rent	300	15
Miscellaneous	200	10

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Q.5) Attempt **any three** from the following:

A) A fair die is rolled 6 times. Getting 5 or 6 is considered as success. Find the probability of (i) no success, (ii) all successes. Also find the mean & variance of the distribution. (5)

B) The average number of customers who appear at the counter of a bank in one minute is 2. Find the probability that in a given minute (i) no customer appears, (ii) at most 2 customers appear. (Take e^{-2} =0.135). (5)

C) If X is a normal variate with mean 240 & standard deviation 10, find (i) P(X≤260), (ii) P(230≤X≤260). (Given that area under the standard normal curve between z=0 & z=1 is 0.3413 & that between z=0 & z=2 is 0.4773) (5)

D) The heights of a group of 100 persons follows a normal distribution with a mean height of 160 cm with a standard deviation of 10 cm. Find the number of persons with height (i) more than 170cm , (ii) more than 145cm. (5)
(Given that for a standard normal variate z, the area under the curve between z=0 and z=1is 0.3413 and between z=0 and z=1.5 is 0.4332.)

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