CBCS SCHEME

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18MBA14

First Semester MBA Degree Examination, Feb./Mar. 2022
Business Statistics and Analytics

Time: 3 hrs.   Max. Marks:100

Note: *1. Answer any FOUR full questions from Q.No.1 to 7.*
      2. Q.No. 8 is compulsory.
      3. Use of Statistical table is permitted.

1 a. What is infeasibility in L.P.P? **(03 Marks)**

    b. The investor buys Rs.1200 worth of shares in a company each month. During the first 5 months he bought the shares at a price of Rs.10, Rs.12, Rs.15, Rs.20 and Rs.24 per share. After 5 months what is the average price paid for the shares by him. **(07 Marks)**

    c. Information on the activities required for a project is as follows:

Name:	A	B	C	D	E	F	G	H	I	J	K
Activities Node:	1-2	1-3	1-4	2-5	3-5	3-6	3-7	4-6	5-7	6-8	7-8
Duration days	2	7	8	3	6	10	4	6	2	5	6

Draw the network and calculate the ES, EF, LS, LF TF times of each of the activities and critical path. **(10 Marks)**

2 a. Explain with an example, what do you mean by mutually exclusive event. **(03 Marks)**

    b. Elucidate different types of probability distribution. **(07 Marks)**

    c. Fit a straight line trend by the method of least squares to the following data. Assuming the same rate of change continues what be the predicted sales for the year 2009?

Year	2000	2001	2002	2003	2004	2005	2006	2007
Sales (Rs. lakh)	76	80	130	144	138	120	174	190

Calculate trend values from 2000 to 2007. **(10 Marks)**

3 a. Bring out the striking difference between correlation and regression. **(03 Marks)**

    b. What is Linear Programming? Mention its Areas of Applications. **(07 Marks)**

    c. The income of a group of 10,000 person was found to be normally distributed with mean Rs.1750 p.m and standard deviation Rs.50. Show that of this group 95% had income exceeding Rs.1668 and only 5 percent had income exceeding Rs.1832. What was the lowest income among the richest 100? **(10 Marks)**

4 a. Bring out the relationship between measures of dispersion. ie. QD, MD and SD Quartile Deviation, Mean deviation and Standard deviation. **(03 Marks)**

    b. Calculate Karl Pearson's coefficient of correlation between age and playing habits from the data given below. Also calculate probable error and comment on the value.

Age	20	21	22	23	24	25
No. of Students	500	400	300	240	200	160
Regular player	400	300	180	96	60	24

(07 Marks)

c. Solve graphically

$$Max \quad Z = 0.07x_1 + 0.10x_2$$
$$S.T. \quad x_1 + x_2 \leq 30,000$$
$$x_1 \geq 6,000$$
$$x_2 \leq 12,000$$
$$x_1 - x_2 \geq 0$$
$$x_1, x_2 \geq 0$$

(10 Marks)

5 a. What is absolute measure and relative measure of variation? **(03 Marks)**

b. Mr. Gupta applies for personal loan of Rs.1,50,000 from a nationalized bank to repair his house. The loan offer informed him that over the years, bank has received about 2920 loan applications per year and the probability of approval was on average above 0.85.
   (i) Mr. Gupta wants to know the average and standard deviation of the number of loans approved/year.
   (ii) Suppose bank actually received 2654 loan applications per year, with an approval probability of 0.82. What are the mean and standard deviation now. **(07 Marks)**

c. From the data given below:
   (i)   Find two regression equation
   (ii) The correlation coefficient between marks in economics and statistics.
   (iii) The most likely marks in statistics when the economics marks is 30.

Marks in Economics	25	28	35	32	31	36	29	38	34	32
Marks in Statistics	43	48	49	41	36	32	31	30	33	39

   (10 Marks)

6 a. Bring out the important properties of good measures of variation. **(03 Marks)**

b. Explain the methods of measurement of seasonal variation. **(07 Marks)**

c. Calculate Spearman's coefficient of correlation between marks assigned to ten students by Judges X and Y in a certain competitive test as shown below:

S.No.	1	2	3	4	5	6	7	8	9	10
Marks by Judge X	52	53	42	60	45	41	37	38	25	27
Marks by Judge Y	65	68	43	38	77	48	35	30	25	50

   (10 Marks)

7 a. What is degeneracy in transportation model? **(03 Marks)**

b. Calculate the trend value by the method of least square from the given data:

Year	2002	2003	2004	2005	2006	2007	2008
Value	75	67	68	65	50	54	41

   (07 Marks)

c. Solve the given transportation problem by using VAM.

From \ To	BHARAT	JANATA	RED LAMP	Supply (Tonnes)
A	7	10	5	90
B	12	9	4	50
C	7	3	11	80
D	9	5	7	60
Demand (tonnes)	120	100	110	

   Because of road construction shipments are temporarily prohibited from warehouse at city A to BHARAT company. Find the feasible solution. **(10 Marks)**

8   A project consists of 9 activities whose time estimates are in weeks and other characteristics given below:

Activity	Preceding Activity	T_0	T_m	T_p
A	-	2	4	6
B	-	6	6	6
C	-	6	12	24
D	A	2	5	8
E	A	11	14	23
F	B, D	8	10	12
G	B, D	3	6	9
H	C, F	9	15	27
I	E	4	10	16

(i)   Show the PERT Network and identify critical activity.
(ii) What is expected project completion time and its variance?
(iii) What is probability of completing project one week before?
(iv) If the project required to be completed by December 31 of a given year and the manager wants to be 95% sure of meeting the deadline, when should he start the project?

(20 Marks)

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