BIJU PATNAIK INSTITUE OF IT & MANAGEMENT STUDIES

1ST SEMESTER MBA (BATCH 2020-22)

CLASS TEST – I

Decision Science (18 MBA 105)

Total Marks : 30 **Time:1½ Hours**

Q.1. Compulsory **[6x1=6 marks]**

i) Define the relation between AM, GM & HM quantitatively.
ii) If n = 10, $\sum x_i = 110$, $\sum (x_i - 5)^2 = 100$ then find S.D. of X.
iii) Mean of Distribution is 22.2 and the Mode is 23.3 find the Median.
iv) The sum of 10 observations is 110 and the sum of square of observations is 2900. Find SD.
v) Find the SD of 5, 5, 5, 9, 9, 9.
vi) Two series of data gave the following :
$\bar{x} = 20$, $\bar{y} = 15$, $\sigma_X = 4$, $\sigma_Y = 3$, r = 0.7 obtain regression co-efficient.

Answer any two : **[3x3=9 marks]**

Q.2. The AM and S.D. of a set of 9 items are 43 & 5 respectively. If an item of value 63 is added to the set, then find the mean & S.D. of 10 items.

Q.3. For a certain frequency table which has been partly reproduced here the mean was found to be 1.46. Calculate the missing frequencies.

No of accidents :	0	1	2	3	4	5		Total
Frequency (No. of days) :	46	?	?	25	10	5	=	200

Q.4. Two Regression line are given below 3X+2Y=10 & 6X+Y=15. Find the correlation coefficient.

Q.5. Find the co-efficient of correlation r, when its probable error is 0.2 and the number of pair of items is 9.

Q.6. From the following frequency distribution, find the Mean Deviation (MD) from the mean and its coefficient.

X	0-5	5-10	10-15	15-20	20-25	25-30
Y	5	10	12	11	5	6

Answer any two : [2x7.5=15 marks]

Q.7. From the following data, calculate the rank correlation co-efficient after making adjustment for tied ranks.

X :	48	33	40	9	16	16	65	24	16	57
Y :	13	13	24	6	15	4	20	9	6	19

Q.8. Write the regression equation X on Y and Y on X for the following data by using method of least square and then predict Y at X = 50 and X at Y = 60.

X	45	48	40	55	62	72	75	78	80	84
Y	15	18	20	25	26	32	40	48	55	65

Q.9. The following data gives experience of machine operators and their performance ratings as given by the number of good parts tuned out per 100 pieces.

Operator	:	1	2	3	4	5	6	7	8
Experience(X)	:	16	12	18	4	3	10	5	12
Performance Ratings (Y)	:	87	88	89	68	78	80	75	83

Calculate the regression line of performance ratings on experience and estimate the probable performance if operator has 7 year's experience.

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BIJU PATNAIK INSTITUE OF IT & MANAGEMENT STUDIES

1ST SEMESTER MBA (BATCH 2018-20)

CLASS TEST - I

Decision Science (18 MBA 105)

Total Marks : 30 **Time:1½ Hours**

[10x1=10]

Q.1. (a) Define dispersion

(b) Write the co-efficient of correlation in the form of regression.

(c) If $\bar{X}$ = 2, $\bar{Y}$ = 3, b_{yx} = 05 then write the regression equation of Y on X.

(d) If series X : 3, 9, 27 find AM and GM.

(e) Express standard error in the form of probable error.

(f) If variance of X = 16, σ_y = 3, r = -0.7
Find b_{yx} and b_{xy}

(g) What are the assumptions of L.P.P. ?

(h) Write all the stages of L.P.P.

(i) If $\Sigma xy = 107$, $\Sigma x^2 = 100$, $\Sigma y^2 = 121$ then find co-efficient of correlation.

(j) Define L.P.P.

[2x5=10]

Q.2.a) A firm manufactures headache pills in two sizes A & B. Size. A contains 2 grain of Aspirin, 5 grains of bi-carbonates, 1 grain of co-dine. Size B contains 1 grain of Aspirin, 8 grands of bicarbonate, 6 grands of co-dine. It is found by user that it requires at least 12 grains of aspirin, 74 grands of bi-carbonate, 24 grains of co-dine for providing immediate effect. Determine the least number of pills; a patient should take to get immediate relief. Formulate the problem as a standard L.P.P.

b) The arithmetic mean and standard deviation of a series of 20 times were calculated by a student as 20cm and 5 cm respectively. But while calculating them an item 13 was misread as 30. Find the corrected S.D. ?

c) Calculate the co-efficient of correlation of Ranks of the following :

Mark in physics (x) :	35	36	47	17	10	43	9	6	20
Marks in mathematics (y) :	30	33	45	23	8	49	12	4	31

Q.3. Answer any one of the following : **[1x10=10]**

a) i) If $\Sigma xy = 193$; $\Sigma x^2 = 120$, $\Sigma y^2 = 346$
N = 10, then find P.E(r) ?

ii) Find the missing frequencies, whose arithmetic average is 33.4 and N=50

x :	0-10	10-20	20-30	30-40	40-50	50-60	60-70
f :	6	5	?	15	?	6	3

b) Calculate the two regression equations and also find out the correlation co-efficient from the following data.

Price (Rs.)	10	12	13	12	16	15
Amount demanded	40	38	43	45	37	43

Estimate the likely demand when price is Rs.20/-

-Best of Luck-

BIJU PATNAIK INSTITUE OF IT & MANAGEMENT STUDIES

1ST SEMESTER (BATCH 2017-19)

CLASS TEST - I

Statistics and Decision Science (MNG-101)

Total Marks : 30 **Time:1½ Hours**

(Question No.1 and 2 are compulsory and answer any Two from Question Nos. 3, 4 and 5)

Q.1. **[5 Marks]**

i) The arithmetic mean of this series : 5 15 7 2 8 9 5 2 11 4 is _____.

ii) The G.M. of the series 3 9 27 is _____.

iii) If bxy = 0.9, σ_x^2 = 16, r = 0.8 then σ_y = _____.

iv) M_d = _____ ?, if M_o = 5.5, $\bar{x}$ = 5.2.

v) If $\bar{x}$ = 5.1, M_d = 5 then skewness = _____.

Q.2. **[5 Marks]**

i) Write merits of A.M. ?

ii) Write all the stages of L.P.P.

iii) How regression co-efficient is related to correlation co-efficient ?

iv) What are components used in Time series analysis ?

v) Define probable error in correlation.

Q.3. **[10 Marks]**

a) Define Time series Analysis. Explain its components and what are models used in Time series analysis ?

b) Find correlation coefficient from the following regression equation.

2.5 Y = X + 35

10 X = Y + 70

Q.4. Find the correlation between sales (Rs.1 lakh) and advertising expenditure from the following data : **[10 Marks]**

Sales (Rs..lakh) :	65	66	67	67	68	69	70	22
Adv. Expenditure :	67	68	65	68	72	72	69	71

Q.5. Given below are the figures of production (in lakh kg.) of a sugar factory. **[10 Marks]**

Year	:	1999	2000	2001	2002	2003	2004	2005
Production	:	40	45	46	42	47	50	46

Fit a straight line trend by the method of least square and find the trend. Also forecast for the year 2008.

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BIJU PATNAIK INSTITUE OF IT & MANAGEMENT STUDIES

1ST SEMESTER (BATCH 2016-18)

CLASS TEST - I

Statistics and Decision Science (MNG-101)

Total Marks : 30 **Time:1½ Hours**

Group – A *(Compulsory)* *(1 X 5 = 5 marks)*

1. (i) Give a difference between Co-relation & regression in one sentence each.
(ii) How do you correlate *Mean*, *Median* & *Mode*?
(iii) Express the formula *skewness* & *kurtosis* in the form of moment.
(iv) When a curve is called Platy Kurtic?
(v) Define SD.

2. (i) If $b_{xy} = 0.65$; *(1 X 5 = 5 marks)*
$\sigma_x = 3;\ \sigma_y^2 = 16\ ; r = ...$

(ii) $P.E_{(r)} = ... \times ..... ?$

(iii) If $\overline{X} = 56; M_d = 37.2\ ;\ \sigma^2 = 16$
then, SK_P = ……. ?

(iv) If C.V. = 10%; $\sigma = 5.2,$ then $\overline{X}$ = ?

(v) If $r = \pm 0.6; b_{yx} = 0.4,$ then $b_{xy} = ...$

Group – B *(Answer any two)* *(2 X 10 = 20)*

3. A firm reported the following data on annual salary and the income tax rate applicable to 30 of its tax payer employees. Find the average income tax rate applicable to the employees of the firm.

Annual salary per employee *('000 Rs.)*	**No. of Employees**	**Income Tax rate** *(%)*
10-20	5	8
20-30	8	10
30-40	10	12
40-50	5	15
50-60	2	20

4. Obtain the regression equations of **X** on **Y** and of **Y** on **X** for the paired data given below. Also compute the co-efficient of correlation.

Market price of **X**	26	28	30	31	35
Market price of **Y**	20	27	28	30	25

5. The median and mode of the distribution of marks obtained by 230 students, as given below are 33.5 and 34, respectively. Frequencies against three classes are missing. Find these missing frequencies.

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequencies	4	16	?	?	?	6	4

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BIJU PATNAIK INSTITUE OF IT & MANAGEMENT STUDIES

1ST SEMESTER (BATCH 2015-17)

CLASS TEST - I

Statistics and Decision Science (MNG-101)

Total Marks : 30 **Time:1½ Hours**

Answer any two of Group – A & Two from Group – B (No. 4 is compulsory)

GROUP - A

1. Solve the following L.P.P. by graphically **[2 x 5 = 10]**

Minimize Z = $8x_1 + 12x_2$

Stc $5x_1 + 2x_2 \geq 20$

$4x_1 + 3x_2 \leq 24$

$x_2 \geq 2$

& $x_1, x_2 \geq 0$

2. The median and mode of the distribution of marks obtained by 230 students as given below are 33.5 and 34 respectively. Find the missing frequencies.

Marks :	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequencies :	4	16	?	?	?	6	4

3. A firm manufacturers 3 products A, B & C. The profits are Rs. 3, Rs. 2 & Rs .4 respectively. The first has 2 machines & given below is the required processing time (in minutes) for each machine on each product.

Machines	**Product-wise** **A**	**Processing Time (min)** **B**
M1	4	3
M2	3	2

Machine M1 & M2 have 2000 & 2500 machines minutes respectively. The first must manufacture 100 units of A's, 200 units of B's, 50 units of C's, but not more than 150 units of A's. Set up on LPP to maximize the profit.

GROUP – B

4. Use SIMPLEX method & solve the following L.P.P. **[2 x 10 = 20]**

Max $Z = 2x_1 + 4\,x_2 + x_3$

Stc $x_1 + 2x_3 \leq 4$

$2x_1 + \frac{1}{2}\,x_2 + x_3 = 9$

& $x_1, x_2, x_3 \geq 0$

5. The share prices of a company in Mumbai & Kolkata Market during the last 10 months are given below

Month	Mumbai	Kolkata	Month	Mumbai	Kolkata
January	105	108	July	109	125
February	120	117	August	110	120
March	115	120	September	104	110
April	118	130			
May	130	100			
June	127	125			

Determine the arithmetic mean & S.D. of prices of shares. In which market are the share prices more stable.

6. Obtain the mean, median & mode of the following distribution of marks given below :

Marks	No. of Students	Marks	No. of Students
Below 10	4	Below 60	86
Below 20	6	Below 70	96
Below 30	24	Below 80	99
Below 40	46	Below 90	100
Below 50	67		

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Best of luck!