END TERM EXAMINATION

SECOND SEMESTER [BBA] APRIL – MAY 2019

Paper Code: BBA-104 **Subject: Quantitative Techniques**

(Batch 2017 Onwards)

Time: 3 Hours   **Maximum Marks: 75**

Note: Attempt any five questions.

Q1 The following are the weekly wages in Rupee of 30 workers of a firm:

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140  139  126  114  100  88   62   77   99   103  108  129  144
148  134  63   69   148  132  118  142  116  123  104  95   80
85   106  123  133
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The firm gave bonus of Rs. 10, 15, 20, 25, 30 and 35 for individuals in the respective salary slab: Exceeding 60 but not exceeding 75; Exceeding 75 but not exceeding 90; and so on upto Exceeding 135 but not exceeding 150.

(a) Generate the classes and draw the histogram of the data.   (6)
(b) Find the average, standard deviation and quartile deviation of the bonus paid.   (9)

Q2 (a) Find the missing values in the given table.

Groups ->	A	B	C	Combined
Number	50	?	90	200
Mean	113	?	115	116
Standard	6	?	7	7.746

(b) Explain the following:-
   (i) Lorenz curve
   (ii) IQR
   (iii)Ogive curves   (6)

Q3 (a) Find the Coefficient of Skewness (by Karl Pearson's method) for the following data: (10)

Class	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequencies	5	9	13	21	20	15	8

(b) Distinguish between Spearman's and Karl Pearson's coefficient of correlation.   (5)

Q4 The following data gives the Age(X) and Blood Pressure(Y) for the 8 persons. Calculate the two regression equations. Take A_x=60 and A_y=60.(15)

Age(X):	52	63	45	36	72	65	47	25
Blood Pressure (Y):	62	53	51	79	43	60	33

Q5 Solve the following LPP:
   Maximize $Z = x_1 + 2x_2 + 3x_3$
   Subject to constraints:
   $2x_1 + x_2 + x_3 <= 2$, $3x_1 + 4x_2 + 2x_3 >= 8$ $x_1, x_2, x_3 >= 0$ (15)

[-2-]

Q6 (a) Write the dual of the following:-
   Max $Z = 7x_1 + 14x_2 + 6x_3 + 10x_4 - 3x_5$ (9)
   subject to conditions:
   $x_5 <= 4000$
   $3x_2 + 2x_4 + x_5 <= 6000$
   $x_1 + x_2 - 3x_5 >= 4500$
   $x_3 + x_4 - 4x_5 >= 3000$
   $x_1, x_2, x_3, x_4, x_5 <= 0$

(b) What are the advantages of duality?   (3)
(c) What is the meaning of shadow prices?   (3)

Q7 Solve the following transportation problem using using Vogels' Approximation Method later check its optimality.   (15)

	Distribution Centres				
Plants	D1	D2	D3	D4	Availability
P1	19	30	50	12	7
P2	70	30	40	60	18
P3	40	10	60	20	10
Requirements	5	8	7	15	35

Q8 A computer center has 4 programmers. The centre needs four application programmes to be developed. The estimated computer time (in minutes) required by the different programmers to develop the application programmes is given below.   (15)

		Programmes		
	A	B	C	D
Programmers				
1	120	100	80	90
2	80	90	110	70
3	110	140	120	100
4	90	90	80	90

Assign the Programmers to the Programmes in such a way that the total computer time is minimum.

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