

# END TERM EXAMINATION

SECOND SEMESTER [BBA] APRIL - MAY 2019

Paper Code: BBA-104

Subject: Quantitative Techniques  
(Batch 2017 Onwards)

Time: 3 Hours

Note: Attempt any five questions. Maximum Marks: 75

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

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

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. (9)

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

(b) Explain the following:- (6)

- (i) Lorenz curve  
(ii) IQR  
(iii) Ogive curves

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	25	79	43	60	33

Q5 Solve the following LPP. (15)

Maximize  $Z = x_1 + 2x_2 + 3x_3$

Subject to constraints:

$$2x_1 + x_2 + x_3 \leq 2, \quad 3x_1 + 4x_2 + 2x_3 \geq 8, \quad x_1, x_2, x_3 \geq 0$$

Q6 (a) Write the dual of the following:- (9)

Max  $Z = 7x_1 + 14x_2 + 6x_3 + 10x_4 - 3x_5$

subject to conditions:

$$x_3 \leq 4000$$

$$3x_2 + 2x_4 + x_5 \leq 6000$$

$$x_1 + x_2 - 3x_3 \geq 4500$$

$$x_3 + x_4 - 4x_5 \geq 3000$$

$$x_1, x_2, x_3, x_4, x_5 \leq 0$$

(b) What are the advantages of duality? (3)

(c) What is the meaning of shadow prices? (3)

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

	Distribution Centres					Availability
	D1	D2	D3	D4		
Plants						
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
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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