National Institute of Technology, Hamirpur (H.P.)
Department of Management Studies
End Semester Exam – Dec 2020
MBA – 1st year

Course Title : Business Analytics **Marks : 50**
Course Code : MB-613 **Semester : 1st**
Time : 2 hrs.

Note: Attempt all the questions. Marks for each question are indicated against them in the bracket.

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1. To test the desirability of a certain modification in typewriters, 9 typists were given two tests of almost same nature, one on the old typewriter in use and the other on the new typewriter. The following difference in the number of words typed per minute were recorded:

Typist	A	B	C	D	E	F	G	H	I
Increase in number of words	2	4	0	3	-1	4	-3	2	5

Do the data indicate that the modification in the typewriter increases typing speed? The relevant critical test statistic is 2.306. (5)

2. Four machines A, B, C and D are used to produce a certain kind of fabric. Their outputs in meters of cloth produced per hour were collected for any randomly selected 4 different hours as shown in the table.

A	8	9	11	12
B	6	8	10	4
C	14	12	18	9
D	20	22	25	23

Do you think that there is a significant difference in the performance of the four machines? The relevant critical test statistic is 5.95. (10)

3. Interpret the values of correlation coefficient r = 1/0/-1. Does correlation signify a cause- and -effect relationship between the variables, Explain? (4)

4. What is the interpretation of y-intercept and the slope in regression equation? Why should a residual analysis always be done as part of the development of a regression model? (6)

5. Differentiate between Binomial and Normal distribution with the help of examples. (5)

6. A manufacturer produces two different models: X and Y, of the same product. Model X makes a contribution of Rs. 50 per unit and model Y, Rs. 30 per unit towards total profit. Raw materials r_1 and r_2 are required for production. At least 18 kg of r_1 and 12 kg of r_2 must be used daily. Also, at-most 34 hours of labour are to be utilized. A quantity of 2 kg of r_1 is needed for model X and 1 kg of r_1 for model Y. For each of X and Y, 1 kg of r_2 is required. It takes 3 hours to manufacture model X and 2 hours to manufacture model Y. Formulate this problem as a Linear Programming model to find out how many units of each model should be produced to maximize the profit and solve with the help of Graphical method (10)

7. An automobile dealer wishes to put four repairmen to four different jobs. The repairmen charge different rates/hour (in dollars) for different jobs as shown in the table below:

Jobs

Repairmen	**A**	**B**	**C**	**D**
1	5	3	2	8
2	7	9	2	6
3	6	4	5	7
4	5	7	7	8

Find the optimal assignment that will result in minimum cost to the dealer. (10)