K. J. Somaiya Institute of Management Studies and Research

Program: MHRDM Semester- II

Subject: Business Statistics (QT in Management)
(EndTerm Examination)

Maximum marks: 50   Date: 11/04/2019   Duration: 3hours

Notes:
1. **You have to attempt 5 questions in all.**

2. **Make suitable assumptions if required and state them.**

3. **Statistical tables are available on demand**

1. The data show the number of shares selling (millions) and the expected price (average of projected low price and projected high price) for 10 selected initial public stock offerings. Develop an estimated regression equation with the number of shares selling as the independent variable and the expected price as the dependent variable. At the .05 level of significance, is there a significant relationship between the two variables? Did the estimated regression equation provide a good fit? Explain. Use the estimated regression equation to estimate the expected price for a firm considering an initial public offering of 6 million shares. Excel output of regression is given below.

(10)

SUMMARY
OUTPUT

Regression Statistics	
Multiple R	0.862428
R Square	0.743781
Adjusted R Square	0.711754
Standard Error	1.419338
Observations	10

ANOVA

	df	SS	MS	F	Significance F
Regression	1	46.78384333	46.78384333	23.22332516	0.001322952
Residual	8	16.11615667	2.014519584		
Total	9	62.9			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%
Intercept	9.264947	1.099136438	8.429296715	2.99177E-05	6.730333995
Shares	0.710515	0.147438496	4.819058534	0.001322952	0.370520962

2. In the contingency table below summarizes the result obtained in the study conducted by a research organization with respect to performance of 4 competing brands of toothpastes among the users:

	A	B	C	D	Total
0 cavities'	9	13	17	11	50
1-5 cavities	63	70	85	82	300
>5 cavities	28	37	48	37	150
Total	100	120	150	130	500

Test the hypothesis that incident of cavities is independent of the brand of toothpaste used.(table value of χ^2 for 6df 12.59 & 16.81 at 5% & 1 % levels of significance) (10)

3. Can the following samples be regarded as coming from same normal population? (10)

Sample	size	Sample Mean	Sum of Sq of Deviation
1	10	12	120
2	12	15	314

4. The Grear Tire Company developed a new steel-belted radial tire to be sold through a national chain of discount stores. Because the tire is a new product, Grear's managers believe that the mileage guarantee offered with the tire will be an important factor in the acceptance of the product. Before finalizing the tire mileage guarantee policy, Grear's managers want probability information about x = number of miles the tires will last. From actual road tests with the tires, Grear's engineering group estimated that the mean tire mileage is μ = 36,500 miles and that the standard deviation is σ = 5000. In addition, the data collected indicate that a normal distribution is a reasonable assumption. What percentage of the tires can be expected to last more than 40,000 miles? In other words, what is the probability that the tire mileage, x, will exceed 40,000?

Let us now assume that Grear is considering a guarantee that will provide a discount on replacement tires if the original tires do not provide the guaranteed mileage. What should the guarantee mileage be if Grear wants no more than 10% of the tires to be eligible for the discount guarantee? (10)

5. (a) Intelligence test of two groups of boys & girls gave the following results

	Mean	SD	NO.
Girls	75	15	150
Boys	70	20	250

Is there a significant difference in the mean scores obtained by the boys & girls?**(5)**

(b) The incidence of a certain disease is such that on an average 20% of workers suffer from it. If 10 workers are selected at random, find the probability that Exactly two workers suffer from the disease. Not more than two workers suffer from the disease. **(5)**

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