M.Com(A&F) DEGREE EXAMINATION,APRIL 2020
I Year II Semester
Quantitative Techniques for Business Decisions

Time : 3 Hours **Max.marks :75**

Section A $(10 \times 2 = 20)$ Marks

Answer any **TEN** questions

1. Write a note on decision tree analysis.
2. Give any two examples for Poisson Distribution
3. In Binomial Distribution, if n=10, p=0.4 and q=0.6 find mean and variance.
4. What is sampling error?
5. Define Sampling.
6. What do you mean by stratified random sampling?
7. What is chi square test?
8. Find out the expected frequency for the below

	Favourable	Non-favourable	Total
New	280	60	340
Conventional	120	40	160
Total	400	100	500

9. List down the different techniques under multivariate analysis.
10. When $\sum xy = 30$; $\sum x^2 = 30$ and $\sum y^2 = 34$, find out the correlation coefficient.
11. What are the three stages of LPP?
12. Find out the initial feasible solution for the following transportation problem using north west corner rule.

	Destination				
Sources		A	B	C	Supply
	I	2	7	4	5
	II	3	3	1	8
	III	5	4	7	7
	IV	1	6	2	14
	Demand	7	9	18	34

Section B $(5 \times 5 = 25)$ Marks

Answer any **FIVE** questions

13. A bank manager has observed that the length of time the customers have to wait for being attended by the teller is normally distributed with mean time of 5 minutes and standard deviation of 0.6 minutes. Find the probability that a customer has to wait (i) for less than 6 minutes (ii) between 3.5 and 6.5 minutes. (Z 1.43 = 0.9236, Z 2.14= 0.4838)

14. Explain the different types of probability sampling.

15. A sample size of 600 persons selected at a random from a large city shows that the percentage of males in the sample is 53. It is believed that the ratio of males to total population in the city is $\frac{1}{2}$. Test whether this belief is confirmed by the observation.

16. A group of seven week old chicken reared on a high protein diet weighed 12,15,11,16,14,14 and 16 ounces. A second group of five chickens similarly treated expect that they are treated on a low protein diet weigh 8,10,14,10 and 13 ounces. Test whether there is significant evidence that additional protein has increased the weight of the chickens. ($t_{0.05}$ for 10 d.f is 1.81)

17. Explain the procedure for testing hypothesis.

18. Find karl pearson's coefficient of correlation between the sales and expenses of the following 10 firms. (figures in Rs. '000)

Firms	1	2	3	4	5	6	7	8	9	10
Sales	50	50	55	60	65	65	65	60	60	50
Expenses	11	13	14	16	16	15	15	14	13	13

19. A car hire company has one car at each of five depots a,b,c,d and e. A customer in each of 5 town A, B, C, D and E require a car. The distance (in miles) between the depots (origins) and the towns (destinations) where the customers are given in the following distance matrix. How should the cars be assigned to the customers so as to minimize the distance travelled?

	a	b	c	d	e
A	160	130	175	190	200
B	135	120	130	160	175
C	140	110	125	170	185
D	50	50	80	80	110
E	55	35	80	80	105

Section C $(2 \times 15 = 30)$ Marks

Answer any **TWO** questions

20. The pay-offs (in Rs.) of three acts A1,A2 and A3 are the possible states-of-nature S1, S2 & S3 are given below:

Acts	States-of-nature		
	S1	S2	S3
A1	-200	2000	4,000
A2	-500	-1,000	6,000
A3	2,000	-500	3,000

The probabilities of the states of nature are: 0.3, 0.4 and 0.3 respectively. Determine the optimal act using the principle of expectation, i.e., according to EMV criterion

21. The following table gives the number of good and bad parts produced by each three shifts in a factory.

Shift	Good	Bad	Total
Day	900	130	1,030
Evening	700	170	870
Night	400	200	600
Total	2,000	500	2,500

Is there any association between the shift and the equality of parts produced? (for v=2 and $\chi^2 0.05 = 5.991$)

22. You are given the following data

Variables	X	Y
Mean	47	96
Variance	64	81
Co-efficient of correlation	.036	

a) Determine the two regression equations
b) Calculate Y when X = 30 and X when Y = 50

23. Solve the following transportation problem (initial feasible solution through vogel's approximation method and optimum solution through MODI method)

From	To			Supply
	A	B	C	
I	6	9	4	14
II	4	9	8	12
III	1	2	6	5
Demand	6	10	15	