SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN (AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai — 600 044.
M.Com. - END SEMESTER EXAMINATIONS APRIL - 2022
SEMESTER - II
20PCOCT2006 - Quantitative Technique For Business Decisions

Total Duration : 3 Hrs.   Total Marks : 60

Section A

Answer any **SIX** questions $(6 \times 5 = 30$ Marks$)$

1. A large flashlight is powered by 5 batteries. Suppose that the life of a battery is normally distributed with mean = 150 hours and S.D 15 hours. The flashlight will cease functioning if one or more of its batteries go dead.
   Assuming the lives of batteries are independent, what is the probability that flashlight will operate more than 130 hours?

2. Before an increase in excise duty on tea, 400 people out of a sample of 500 people were found to be tea drinkers. After an increase in duty, 400 people were tea drinkers in a sample of 600 people.
   Compute whether there is a significant decrease in the consumption of tea.

3. What are the different types of correlation?

4. The number of parts for a particular spare part in a factory was found to vary from day to day. In a sample study, the following information was obtained:

Day	Mon	Tues	Wed	Thurs	Fri	Sat	Total
No of parts demanded	1124	1125	1110	1120	1126	1115	6720

   Compute and test the hypothesis that the number of parts demanded does depends on the day of the week.

5. Prices of shares in (Rs.) of a company on the different days in a month were found to be :
   66,65,69,70,69,71,70,63,64,68
   Interpret that the test whether the mean price of the shares in the month is 65.

Contd...

6. A department has five employees with five jobs to be performed. The time (in hours) each man will take to perform each job is given in the effectiveness matrix:

Jobs	Employees				
	I	II	III	IV	V
A	10	5	13	15	16
B	3	9	18	13	6
C	10	7	2	2	2
D	7	11	9	7	12
E	7	9	10	4	12

Compute how the jobs to be allocated, one per employee so has to minimise the total man hours.

7. Transportation problem.

	D1	D2	D3	D4	Capacity
S1	19	30	50	10	7
S2	70	30	40	60	9
S3	40	8	70	20	18
Demand	5	8	7	14	34

Compute the initial basic feasible solution and total cost under North west corner method.

8. A company management and the labour union are negotiating a new three-year settlement. Each of these as 4 strategies

I: Hard and aggressive strategy   II: Reasoning and logical approach
II: Legalistic strategy   IV: Conciliatory approach

The costs of the company are given for every pair of strategy choice

Union strategy	Company strategy			
	I	II	III	IV
I	20	15	12	35
II	25	14	8	10
III	40	2	10	5
IV	-5	4	11	0

Determine what strategy will the two sides adopt? And also determine the value of the game.

Section B

Part A

Answer any **TWO** questions $(2 \times 10 = 20$ Marks$)$

9. A market researcher at a major automobile company classified households by car ownership. The relative frequencies of the households for each category of ownership are shown in the table:

No of cars per house hold	Relative frequencies
0	0.10
1	0.30
2	0.40
3	0.12
4	0.06
5	0.02

   (a) Solve the probability distribution for the random variable.
   (b) Compute the expected value of the random variable, and interpret the result.
   (c) Compute the values of the variance and standard deviation of the probability distribution.

10. Describe the procedure for hypothesis testing.

11. A company makes two kinds of leather belts. Belt A is a high-quality belt and belt B is of lower quality. The respective profits are Rs 4 and Rs 3 per belt. The production of each of type A requires twice as much time as a belt of type B, and if all belts were of type B, the company could make 1,000 per day. The supply of leather is sufficient for only 800 belts per day (both A and B combined). Belt A requires a fancy buckle and only 400 per day are available. There are only 700 buckles a day available for belt B. What should be the daily production of each type of belt? Formulate this problem as an LP model and solve it by simplex method.

12. The Parker Flower Shop promises its customers delivery within four hours on all flower orders. All flowers are purchased on the previous day and delivered to Parker by 8.00 AM the next morning Parker's daily demand for roses is as follows.

Dozens of roses	7	8	9	10
Probability	0.1	0.2	0.4	0.3

Contd...

Parker purchases roses for Rs.10 per dozen and sells them for Rs.30. All unsold roses are donated to a local hospital. Evaluate the dozens of roses should Parker order each evening to maximise its profits and also evaluate the optimum expected profit?

Part B

Compulsory question $(1 \times 10 = 10$ Marks)

13. Determine the correlation co-efficient between the sales and expenses from the data given below:

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

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