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.(A&F) - END SEMESTER EXAMINATIONS NOVEMBER - 2022
SEMESTER - I
20PAFCT1003 - Quantitative Technique for Business Decisions

Total Duration : 2 Hrs 30 Mins.   Total Marks : 60

Section A

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

1. State the characteristics of Normal Distribution.

2. Suppose a company can produce any number of the products A, B and C and the pay-offs under different states of nature of demand under good, fair and poor are given below:

States of Nature

Product	Good	Fair	Poor
A	70,000	40,000	-20,000
B	60,000	65,000	-10,000
C	55,000	45,000	15,000

Find decision criterion under (i) Hurwicz Criterion ($\alpha = 0.7$) (ii) Laplace Criterion

3. Briefly explain the terms 'Sampling error' and 'Standard error'.

4. A soap manufacturing company was distributing a particular brand of soap through a large number of retail shops. Before a heavy advertisement campaign. The mean sales per week per shop was 140 dozen. After the campaign a sample of 26 shops was taken and the mean sales was found to be 147 dozens with a standard deviation of 16. can you consider the advertisement is effective.
(Total value of t for 25 df at 5% level=2.06)

5. From the data given below about the treatment of 250 patients suffering from a disease, state whether the new treatment is superior to the conventional treatment:
(Degrees of freedom $= 1$, Chi-square 5 per cent $= 3.84$)

Treatment	No. of patients		Total
	Favourable	Not favourable	
New	140	30	170
Conventional	60	20	80
Total	200	50	250

Carry out testing procedure as per Chi-square test.

6. Solve using Simplex method:
Maximize Z = 3x$_1$ + 4 x$_2$

Subject to

$$x_1 + x_2 \leq 40$$
$$x_1 + 2x_2 \leq 60$$
$$x_1 , x_2 \geq 0$$

Contd...

7. Solve the following transportation problem by using **North West Corner rule.**

Markets

		M1	M2	M3	**Supply**
warehouse	W1	26	23	10	61
	W2	14	13	21	49
	W3	16	17	29	90
Demand		52	68	80	200

8. The following data are the characteristics of a project:

Activity	Immediate Predecessors	Duration in days
A	-	2
B	A	3
C	A	4
D	B,C	6
E	-	2
F	E	8

Draw the network diagram for the above project. Find the minimum project completion time and the critical path.

Section B

Part A

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

9. A distributor buys perishable items at Rs.2 per item and he sells it for Rs.5 and unsold items have no value. He collects data of demand for the last 300 days with adequate probabilities. The data is given in the following table. He is interested to know how many units he has to stock in order to get maximum profit.

Draw the pay-offs table and suggest him.

Daily Demand (Units)	No. of days	Probability
10	30	0.1
11	60	0.2
12	120	0.4
13	90	0.3
	300	1.0

10. Explain the different methods of Sampling.

11. There are three main brands of a certain powder. A set of 120 sample values is examined and found to be allocated among four groups (A,B,C and D) and three brands (I, II, III) as shown here under:

Brands	Groups			
	A	B	C	D
I	0	4	8	15
II	5	8	13	6
III	18	19	11	13

Is there any significant difference in brands preference? Answer at 5% level, using one-way ANOVA. **[Table value of F at 5% level for (2 , 9) df $= 4.26$]**

Contd...

20PAFCT1003 - Quantitative Technique for Business Decisions

12. Find the minimum cost solution for the following transportation problem which has cost structure as

	To			**Availabilities**
From	16	19	12	14
	22	13	19	16
	14	28	8	12
Demand	10	15	17	

Part B

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

13. Four jobs can be processed on four different machines, one job on one machine. Resulting times in minutes vary with assignments. They are given below:

	Machines			
Jobs	**A**	**B**	**C**	**D**
I	42	35	28	21
II	30	25	20	15
III	30	25	20	15
IV	24	20	16	12

Find the optimum assignment of jobs to machines and the relevant time.

******