Roll.No. | **25PAFCT1002**

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(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 2025
SEMESTER - I
25PAFCT1002 - Quantitative Techniques for Business Decisions

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

Section B

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

1. Calculate Karl Pearson's coefficient of correlation from the following data:

X	2	5	7	9	19	16
Y	25	27	26	29	34	39

2. An IQ test was administered to 5 persons before and after they were trained. The results are given below:

Candidates	I	II	III	IV	V
IQ before training	110	120	123	132	125
IQ after training	120	118	125	136	121

Test whether there is any change in IQ after the training programme.

3. Find all the basic feasible solutions of the equations:
$2x_1 + 6x_2 + 2x_3 + x_4 = 3$
$6x_1 + 4x_2 + 4x_3 + 6x_4 = 2$

4. The following are the details of a project.

Activity	**Preceding Activity**	**Time (days)**
A	-	1
B	-	2
C	-	2
D	A,B	2
E	B,C	4
F	C	1
G	D	4
H	E,F,G	8

Find the critical path and completion time of project.

5. Describe the characteristics of a good Sampling Distribution.

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6. Set up ANOVA table for the following per hectare yield for three varieties of wheat, each gown in four plots: Per hectare yield (in hundred kgs).

Plots of land	**Variety of wheat**		
	A1	A2	A3
1	6	5	5
2	7	5	4
3	3	3	3
4	8	7	4

Also work out F-ratio and test whether there is significant difference among the average yields in the 3 varieties of wheat.

7. Consider the following unbalanced transportation problem:

		To			
From		1	2	3	**Supply**
	1	5	1	7	10
	2	6	4	6	80
	3	3	2	5	15
Demand		75	20	50	

Since there is not enough supply, Some of the demands at these destinations may not be satisfied. Suppose there are penalty costs for every unsatisfied demand unit which are given by 5,3 and 2 for destinations 1,2 and 3 respectively. Find the optimal solution.

8. Examine the steps involved in drawing a Network Diagram.

Section C

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

9. You are given the following:

X	87	84	88	102	101	84	72	84	83	98	97	100
Y	88	79	83	97	96	90	82	84	88	100	80	102

(i) Fit a line of regression of Y on X.
(ii) Suggest what the value of Y will be when X is expected to be 110.

10. Classify the steps involved in factor analysis and discuss how factors are extracted and interpreted.

11. Can vaccination be regarded as preventive measure of small-pox as evidenced by the following data? "Of 1482 persons exposed to small-pox in a locality 368 in all were attacked. Of these 1482 persons, 343 were vaccinated and of these only 35 were attacked". Given that Chi-square value at 5% level of significance for 1 df is 3.84.

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12. Solve the following LPP by Graphical methods.
    Min z = 3 x_1 + 2 x_2
    Subject to 5 x_1+ $x_2 \geq 10$
    $x_1 + x_2 \geq 6$
    $x_1 + 4x_2 \geq 12$
    $x_1, x_2 \geq 0$

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

13. The ethical activities of a project, their expected durations and standard deviations (in weeks) are given below:

Activity	B	E	G	H	K	L
Expected Duration	12	3	8	7	5	6
Standard deviation	2/3	1/3	2	5/3	4/3	0

    (i) What is the probability that the project will be completed in 45 weeks?
    (ii) If the manager wants the probability to be 98 percent of completing the project in time, how many weeks prior to the deadline should she start the project?

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