

Roll.No.

23UCOCT3007

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(AUTONOMOUS)

(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai - 600 044.

B.Com. - END SEMESTER EXAMINATIONS - NOVEMBER 2025
SEMESTER - III

23UCOCT3007 - Business Statistics and Operations Research-II

Total Duration : 2 Hrs.30 Mins.

Total Marks : 60

Section B

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

1. Three coins are tossed .find the probability of getting (i) atleast one Head
(ii)Exactly two Heads
2. Using three years moving average determine the Trend and short term
Fluctuation.

2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
21	22	23	25	24	22	25	26	27	26

3. A dietician wishes to mix two types of food in such a way that the vitamin contents of the mixture contains at least 8 units of vitamin A and 10 units of vitamin B. Food I contains 2 units per kg of vitamin A and 1 unit per kg of vitamin B while the food II contains 1 unit per kg of vitamin A and 2 units per kg of vitamin B. It costs Rs 5 per kg to purchase food I and Rs 8 per kg to purchase food II. Prepare a mathematical model of the problem stated above.
4. Pearsons coefficient of skewness is -0.7and the value of median and standard deviation are 12.8 and 6 respectively. Determine the value of mean.
5. The following data are the characteristic of a project.

Activity	Immediate predecessor	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 project,find the minimum project time and critical path.

6. A bag contains 6 black balls and 5 red balls .Two balls are drawn at the random what is the probability that is white or red.

Contd...

7. Explain the components of Time series.
8. Distinguish between Skewness and kurtosis.

Section C

Answer any **THREE** questions ($3 \times 10 = 30$ Marks)

9. Calculate Karl Pearson's coefficient of skewness for the following data.

Class	0-6	6-12	12-18	18-24	24-30	30-36
Frequency	5	12	18	38	20	7

10. Solve the following problem using Simlex method
 Maximise $Z = 21x_1 + 15x_2$
 Subject to the constraints $-x_1 - 2x_2 \geq -6$
 $4x_1 + 3x_2 \leq 12$
 $x_1 \geq 0, x_2 \geq 0$
11. A project consists of eight activities denoted by A, B, C, D, E, F, G and H. Relationship between the activities is as follows:
 - (1) The project starts with activity A.
 - (2) When A is completed activities E and B may be started
 - (3) Activity F may be started when E is completed. Activity B depends for its start on the completion of F and B.

When F is completed activity G may begin when I is completed, D may begin. H may begin when G and D are completed and is a final activity.

Expected time (in days) for the activities is given below:

Activity	A	B	C	D	E	F	G	H
Expected time (days)	10	9	3	15	5	17	8	7

- (a) Draw the network
 - (b) Determine total slack of the activities and the project duration.
12. A Bag contains 4 white balls and 6 black balls. Two balls are drawn at random. What is the probability that (a) Both are white (b) both are black, (c) one white and one black.
13. Enumerate the methods of determining trend in time series.
