

Mid-West University
Examinations Management Office
 Surkhet, Nepal
 End-Semester Examination-2081
 Bachelor of Business Studies (BBS)
 Semester - III

Subject: Business Statistics-II
 Full Marks: 60 Pass Marks: 30

Course Code: MGMT 433/333
 Time: 3: 00 Hours

You are required to answer in your own words as far as applicable. Figures in the margins indicate full marks.

SECTION A: SHORT ANSWER QUESTIONS (10x1=10 MARKS)
 Answer ALL the questions.

- If unexplained and total variations of a data set are 190 and 1000 respectively. Find the coefficient of determination.
- The year of origin of the following straight line trend equation of sales (in millions of Rs.) is 2018.
 $Y = 35 + 7.5X$
 Estimate the sales for the year 2024.
- List out any two types of non-probability sampling.
- The following values are given:
 $\sum p_0q_0 = 510$ $\sum p_1q_0 = 565$ $\sum p_0q_1 = 525$ $\sum p_1q_1 = 595$
 Calculate the Paasche's price index of current year with respect to base year.
- Consider a project with the following activities and predecessors:

Activities	A	B	C	D	E	F
Starting and finishing event	(1,2)	(2,3)	(3,4)	(3,5)	(4,6)	(5,6)
Predecessors activities	-	A	B	B	C	D

Draw a network diagram.

- What are the types of error in testing hypothesis?
- What do you mean by 'Time reversal test' for index numbers?
- Explain, briefly, the components of time series.
- What do you understand by the term pay-off matrix?
- What do you mean by the level of significance?

SECTION B: SHORT ANSWER QUESTIONS (3x4=12 MARKS)
 Answer any THREE questions.

- The following are the data of annual production of a manufacturing company:

Years	2018	2019	2020	2021	2022	2023
Production (in millions units)	225	242	255	268	264	276

- Fit a straight line trend using the least square method. [4]
 - Obtain the trend values using straight line trend. [3]
 - Estimate the likely production unit for the year 2025. [1]
- An enquiry into the budget of the middle class families in a certain city in Nepal gave the following information.

Expenses on	Food 60%	Clothing 10%	Education 20%	Fuel 6%	Miscellaneous 4%
Price in 2020 (Rs.)	150	300	450	180	140
Price in 2023 (Rs.)	190	315	650	190	200

What is the cost of living index number of 2023 as compared with that of 2020?

13. Obtain initial feasible solution for the following transportation problem using:

[4+4]

- a. North West corner method. b. Least cost method.

Sources	Destinations				Supply
	D ₁	D ₂	D ₃	D ₄	
S ₁	8	12	5	7	30
S ₂	15	6	14	9	35
S ₃	4	18	11	10	20
S ₄	13	12	10	3	15
Demand	28	32	17	23	

14. A payoff (profit) matrix is given below. Determine the best alternative using:

[3+5]

- a. Maximax criterion. b. Minimax regret criterion.

Decision Alternatives	States of Nature			
	N ₁	N ₂	N ₃	N ₄
S ₁	10	14	17	20
S ₂	8	13	18	23
S ₃	6	13	19	25
S ₄	5	12	22	27

15. What is the assignment problem? From the following cost matrix, use the Hungarian method to find the optimal assignment.

[2+6]

Task	Employees			
	A	B	C	D
M	9	2	7	8
N	6	4	3	7
O	5	8	1	8
P	7	6	9	4

SECTION C: LONG ANSWER QUESTIONS (2 X 11 = 22 MARKS)

Answer any TWO questions.

16. The heights (in cm.) of a group of fathers and sons are given below:

Heights of fathers	166	158	163	167	181	172	165	167	177	170
Heights of sons	158	163	167	170	185	175	170	170	175	180

Find

- a. Two regression equations. [8]
 b. Estimate the height of son when the height of the father is 164 cm. [3]
 c. The coefficient of correlation between heights of fathers and heights of sons. [2]
17. The milk cake seller can purchase 'Chocolate Milk Cake' at the rate of Rs. 25 per piece and sell at Rs. 40 per piece. Any cake unsold for the day is a total loss. The seller on the basis of past sells, he estimated the probability of selling various quantities are as follows:

No. of chocolate milk cake sales per day	15	16	17	18	19	20
Probability	0.05	0.20	0.30	0.25	0.15	0.05

- a. How many copies should he order so that his expected profit will maximum? [9]
 b. Compute the expected profit with perfect information. [3]
 c. Compute the expected value of perfect information. [1]
18. In a packaging plant, a machine packs cartons with jars. It is supposed that a new machine would pack faster on the average than the machine currently used. To test the hypothesis, the time it takes each machine to pack ten cartons are recorded. The result in seconds is as follows.

New Machine	42.1	41.0	41.3	41.8	42.4	42.8	43.2	42.3	41.8	42.7
Old Machine	42.7	43.6	43.8	43.3	42.5	43.5	43.1	41.7	44.0	44.1

Do the data provide sufficient evidence to conclude that, on the average, the new machine packs faster? Perform the required hypothesis test at the 5% level of significance.

THE END