TRIBHUVAN UNIVERSITY

2081 (Regular)

B.B.S. 4 Yrs. Prog. / 1 Year / MCMT — Full Marks: 100

MGT 202 : Business Statistics — Time: 3 hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Group "A"

Brief Answer Questions — [10×2=20]

Attempt ALL questions.

1. Calculate the coefficient of variation of a distribution, if mean is found to be 200 and variance of distribution is 36.
2. The Karl Pearson's coefficient of skewness is 0.5 if mean = 45 and standard deviation = 15, find the value of mode.
3. If P(A) = 0.6 P(B) = 0.5 and P(A∪B) = 0.4 find P(A∩B). Where A and B are not mutually exclusive events.
4. Find the coefficient of quartile deviation of a distribution when upper and lower quartiles are 90 and 55 respectively.
5. Calculate coefficient of correlation (r), if $b_{yx} = -0.57$ and $b_{xy} = -0.82$ respectively.
6. Find the simple aggregative price index number from the following data:

Commodities	A	B	C	D	E
Price in 2022	45	40	58	35	20
Price in 2023	55	42	50	32	28

7. Find the value of determinant $\begin{vmatrix} 3 & 2 & 1 \\ 2 & 3 & 5 \\ 3 & 5 & 1 \end{vmatrix}$

8. Find $\frac{1}{3}(A-B)$ where $A=\begin{bmatrix}8 & 9\\ 9 & 10\\ 2 & 5\end{bmatrix}$ and $B=\begin{bmatrix}5 & 6\\ 3 & 4\\ 8 & 5\end{bmatrix}$

9. The following table shows the average daily wages of workers in city A and B, find the combined average wage of the workers.

City	A	B
Average daily wage (Rs)	1000	1200
No. of workers	250	200

10. Define the qualitative classification of data with a suitable example.

Group "B"

Descriptive Answer Questions [5×10=50]

Attempt any *FIVE* questions.

11. The following table shows the marks distribution of students of a college:

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No. of Students	8	15	20	27	22	18	10

Calculate limits of marks obtained by middle 80% of the students.

12. Solve the following equations by using determinant or matrix method

$$5x+3y+z=16$$
$$2x+y+3z=19$$
$$x+2y+4z=25$$

13. The following table gives the changes in the price (in Rs) and the quantity (units) of certain commodities:

Commodity	2022		2023	
	Price	Quantity	Price	Quantity
A	1200	15	1500	17
B	1700	20	1800	16
C	500	50	400	60
D	100	25	120	30

Calculate price index number according to (a) Laspeyre's formula (b) Paasche's formula and (c) Fisher's ideal formula.

14. (a) Solve the following Linear Programming problem graphically:

Maximize $Z = 4x + 3y$

Subject to constraints: $2x + y \leq 10$

$x + y \leq 6$

and $x \geq 0, \quad y \geq 0$

(b) The following table is the conditional payoff table

Strategy	States of nature			
	A	B	C	D
S_1	200	210	240	220
S_2	180	220	220	210
S_3	270	200	340	280
S_4	260	180	300	120
S_5	250	190	240	200

Provide a decision according to:

i) Maximax criterion
ii) Maximin criterion
iii) Minimax reject criterion

15. The following table shows the distributions of wages (in Rs) of workers. Test the normality of the wage distribution.

Daily wages in (00 Rs)	Number of workers
20 - 30	10
30 - 40	20
40 - 50	25
50 - 60	34
60 - 70	28
70 - 80	18
80 - 90	15

16. Find the appropriate measure of dispersion from the following income table:

Monthly income (Rs.)	Number of Persons
Below 1000	15
1000 - 1999	500
2000 - 2999	550
3000 - 3999	300
4000 - 4999	200
5000 and above	150

Group "C"

Analytical Answer Questions [2×15=30]
Attempt any TWO questions.

17. Following two samples describes the age (year) of the students in regular MBS program and MBA program of a campus:

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P.T.O.

MBS	25	30	28	25	23	22	26	27	28	24
MBA	26	27	34	33	29	27	28	29	33	28

(a) If homogeneity of the age is a positive factor for teaching-learning process, which of the two programs will be easier to teach?

(b) Calculate combined standard deviation.

18. The following time series data shows the profit (million Rs) of XYZ company from the fiscal year 2015 to 2023:

Year	Profit (Million Rs)
2015	15
2016	18
2017	20
2018	22
2019	25
2020	23
2021	27
2022	32
2023	30

a. Fit a straight line trend to these data.
b. Calculate the trend values and short term fluctuations.
c. Plot the actual data as well as the trend values on the graph paper.
d. Estimate the profit for 2024.
e. What is the monthly increment of the profit?

19. The following table provides the fertilizer used and production of paddy in certain plots of hilly region of Nepal.

Plots	Fertilizer used (Metric tons)	Production of paddy (Metric tons)
A	11	185
B	15	183
C	12	184
D	14	186
E	16	189
F	18	187
G	20	190
H	23	192
I	25	195

From the above table

a) Find two regression co-efficients.

b) Calculate the co-efficient of correlation between fertilizer used and production of paddy and interpret the result.

c) Estimate the production of paddy when fertilizer used is 50 metric tons.

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