Roll No:
Date: __/__/____

St. Claret College

Autonomous, Bengaluru

14

UG END SEMESTER EXAMINATION-NOV 2025
BBA I SEMESTER
BM 1725: BUSINESS MATHEMATICS AND STATISTICS

TIME: 3 hours. **MAX. MARKS: 80**

This paper contains THREE printed pages and FOUR parts

Instructions:
1. **Verify and ensure that the question paper is completely printed.**
2. **Any discrepancies or questions about the exam paper must be reported to the COE within 1 hour after the examination.**
3. **Students must check the course title and course code before answering the questions.**

PART-A

Answer ALL questions. Each answer carries ONE mark. **[1 x 10 = 10]**

1. The ratio of 3 to 12 is equivalent to:
   a) 1 : 4 b) 1 : 3 c) 1 : 2 d) 4 : 1
2. The ratio of pens to pencils in a box is 5 : 3. If there are 40 items in total, how many pencils are there?
   a) 15 b) 20 c) 25 d) 30
3. Solve for x: $5x-10=15$
   a) 4 b) 5 c) 6 d) 7
4. Which of the following is a linear equation in two variables?
   a) $2x+3y=5$ b) $x^2+y=7$ c) $xy=10$ d) $x^2+y^2=25$
5. The marks of 5 students are 12, 15, 18, 20, 25. The mean marks is
   a) 16 b) 18 c) 19 d) 20
6. Which type of diagram is most suitable for representing a frequency distribution of continuous data?
   a) Pie chart b) Histogram c) Bar chart d) Line graph
7. The standard deviation of a dataset measures:
   a) Average of the values b) Spread of values around the mean
   c) The middle value d) Most frequent value
8. If the standard deviation of a dataset is 5 and the mean is 50, the coefficient of variation (CV) is:
   a) 5% b) 10% c) 15% d) 20%
9. Which component of a time series shows long-term upward or downward movement?
   a) Seasonal component b) Cyclical component
   c) Trend component d) Irregular component

10. Exponential smoothing in forecasting is used to:
    a) Smooth past data with equal weights
    b) Give more weight to recent observations
    c) Measure the standard deviation of time series
    d) Identify seasonal indices

PART-B

Answer any 3 questions. Each answer carries 8 marks. **[8 x 3= 24]**

11. a) A firm invests in three projects in the ratio 7 : 5 : 3. If the total investment is ₹3,00,000, find the amount invested in each project.
    b) If 15 workers can finish a piece of work in 24 days, how many workers are required to finish it in 10 days? (5+3)
12. a) Solve the following system of equations using substitution method
    $x+y=10$, $2x-y=3$
    b) Solve the following quadratic equation by factorization method
    $x^2-7x+12=0$ (4+4)
13. The following table shows the monthly income (in ₹1000) of 50 employees.

Income (₹1000)	10–20	20–30	30–40	40–50	50–60
Frequency	5	10	20	10	5

    Find the median income and interpret.
14. The marks obtained by 10 students in an exam are:
    12, 15, 18, 20, 22, 25, 28, 30, 32, 35
    Find quartile deviation and its co-efficient.
15. What is time series? Explain the components of time series with an example.

PART-C

Answer any 3 questions. Each answer carries 12 marks. **[12 x 3= 36]**

16. a) The income of A and B is in the ratio 7 : 9, and their expenses are in the ratio 3: 5. If each saves ₹5,000, find their incomes.
    b) Find duplicate, triplicate, and sub-duplicate ratios of 3 : 5.
    c) A train travels 120 km in 2 hours. What is its speed? (5+4+3)
17. a) The salary of A, B and C are in continued proportion. If the salary of B and C are respectively ₹250 and ₹1250. Find the salary of A.
    b) Solve the following system of equations using elimination method.
    $3x+2y=16$, $5x-2y=14$
    c) Solve the following quadratic equation using the quadratic formula method.
    $2x^2-5x-3=0$ (4+4+4)
18. a) The following frequency distribution shows the number of products sold by a company in a week.

Products Sold	0–10	10–20	20–30	30–40	40–50
Frequency	5	10	25	15	5

    Find the mean number of products sold.
    b) What is mode? Write its merits and de-merits. (6+6)

19. The daily revenue of two branches of a store for a week (in ₹1000) is:
Branch X: 50, 55, 52, 48, 50, 53, 51
Branch Y: 80, 90, 85, 95, 100, 92, 88

a) Calculate the Co-efficient of Variation (CV) for both branches.

b) Determine which branch has more consistent revenue.

20. a) The monthly sales (in units) of a company for 12 months are:
120, 130, 125, 140, 150, 145, 160, 155, 170, 165, 180, 175
Calculate the 3-month moving average to identify the trend and interpret.
b) Explain exponential smoothing forecasting method. (6+6)

PART-D

Answer the following question **[10 x 1= 10]**

21. The monthly wages (₹) of 8 factory workers are:
15000, 16000, 17000, 18000, 19000, 20000, 21000, 22000
a) Find average(mean) wage and interpret.
b) Calculate the range and coefficient of range.
c) Find the standard deviation.
d) Compute the coefficient of variation (CV) and interpret.