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Reg. No. : .....

Name : .....

Second Semester B.Com. Degree Examination, September 2023

First Degree Programme under CBCSS

Complementary Course

CO 1231/CX 1231/CC 1231 : BUSINESS MATHEMATICS

(2018 Admission Onwards)

Time : 3 Hours **Max. Marks : 80**

PART – A

Answer all questions. Each question carries **1** mark.

1. Find the inverse of the matrix:

$$A = \begin{bmatrix} 2 & 3 \\ 3 & 5 \end{bmatrix}$$

2. Solve: $x + y = 8$; $xy = 15$

3. Solve: $x^2 + 2x - 8 = 0$.

4. Convert the given fraction into mixed fraction: $\frac{22}{7}$.

5. If the amount for 2 years at 6% is Rs. 4,000, what was the principal?

6. Find the value of $\frac{5}{6}$ of 30.

P.T.O.

7. Name methods of depreciation.

8. Conver 0.416 into fraction.

9. Convert 2% into fraction.

10. Find two numbers whose sum is 30 and difference is 4.

(10 × 1 = 10 Marks)

PART – B

Answer any eight questions. Each carries 2 marks.

11. Find the roots of the quadratic equation by factoring: $2x^2 + 7x + 3$.

12. Find the compound amount, which would be obtained from an interest of Rs. 2,000 at 6% compounded quarterly for 5 years.

13. Find the number of permutations of word ALLAHABAD.

14. Two third of a number increased by 3 equals 13. Find the number.

15. Represent in quadratic equation: The area of rectangular plot is 528 m^2. The length of the plot (in meters) is one more than twice its breadth. We need to find the length and breadth of the plot.

16. An English test was conducted out of 80 marks. Vani scored 90%, Tanya scored 85% and Pranoy scored 82.5 %. How many marks did each one score?

17. Rudy will retire in 20 years. This year he wants to fund an amount of Rs. 15,000 to become available in 20 years. How much does he have to deposit into a pension plan earning 7% annually?

18. Find two numbers whose sum is 30 and difference is 4.

19. Solve

$4x + 2y = 6$
$5x + y = 6$

20. What is Determinant?

21. Find the simple interest and amount for Rs. 25,000 at 10% p. a for 26 weeks.

22. The ages of Hari and Hani are in the ratio of 4:5. Eight years from now, the ratio of their ages will be 5:6. Find their present age.

(8 × 2 = 16 Marks)

PART – C

Answer any **six** questions. Each carries **4** marks.

23. A committee of 3 persons is to be constituted from a group of 2 men and 3 women. In how many ways can this be done?

24. If the demand function for a commodity is given by the equation $p^2 + 4q = 1600$, and the supply function is given by the equation $550 - p^2 + 2q = 0$. Find the equilibrium quantity and equilibrium price.

25. Happy Harry has just bought a scratch lottery ticket and won Rs.10,000. He wants to finance the future study of his newly born daughter and invests this money in a fund with a maturity of 18 years offering a promising yearly return of 6%. What is the amount available on the 18th birthday of his daughter?

26. Let $A = \begin{bmatrix} 1 & 2 & 3 \\ -2 & 1 & 4 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 3 & 1 \\ 5 & 4 & 2 \\ 1 & 5 & 3 \end{bmatrix}$ Compute AB.

27. Mr. A borrowed Rs. 20,000/- from a person, but he could not repay any amount in a period of 4 years. So the lender demanded as 26,500. What is the rate of interest charged?

28. From the following particulars, calculate stock turnover ratio.

	Rs.
Opening stock	40,000
Purchases	1,20,0000
Carriage on purchases	10,000
Sales	2,00,000
Closing Stock	30,000

29. Fixed costs for the year are Rs. 60,000. The sales for the period are Rs. 4,00,000 and variable costs are amounted to Rs. 3,00,000. Calculate BEP Sales.

30. A salesman gets commission on total sales at 11%. If the sale exceeds Rs. 15,000 he gets an additional commission as bonus of 4% on the excess sales over Rs. 15,000. If he gets total commission of Rs. 1,980, then what is the bonus received?

31. Michael buys share of face value Rs. 50 of a company which pays 10% dividend. At what price did he buy each share from the market if his profit is 16% on his investment?

(6 × 4 = 24 Marks)

PART – D

Answer any two questions. Each carries 15 marks.

32. (a) From the following information, calculate Debtors Turnover Ratio and average collection period in days.

Total Sales for the year = Rs. 1,75,000

Cash Sales = 20% of sales

Sales return (out of credit sales) = 20,000

Sundry Debtors:

Opening : Rs. 8,000

Closing : Rs. 12,000

(b) From the following details determine the value of debtors:

Total sales = Rs.5,00,000

Cash sales = Rs. 2,00,000

Debtors velocity = 30 days

Bills Receivable = Rs. 5,000.

33. (a) The trader has INR 10,000 to invest in the exchange-traded funds traded in the off shore market. However, the trader lives in India, and 1 INR corresponds to 0.014 USD. Help the trader determine the value of INR investment in terms of US currency.

(b) A machine was purchased on January 1, 2011 for Rs. 1,00,000 and its useful life is 10 years. After completing its useful life the machine will be scraped and nothing will be realized from it. It is decided to charge depreciation on this machine @ 10% p. a. on Straight Line Method. Calculate amount of depreciation for each year during the useful life of this machine

34. Calculate the BEP, Margin of Safety and Sales required to earn a profit of Rs. 5,000 from the following information:

	Rs.
Sales:	40,000
Fixed costs:	7,500
Direct Material:	20,000
Direct Labour:	6,000
Direct Expenses:	4,000

35. (a) An individual planning a trip from the USA to European Union. He has planned budget of USD 5,000. The travel agent informs the traveler that if he exchanges US dollars to Euro, he will get Euro 4,517.30. Help the traveler determine the exchange rate between the USA and the Euro.

(b) State the rules of differentiation.

(2 × 15 = 30 Marks)