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Second Semester B.Com. Degree Examination, December 2021

First Degree Programme under CBCSS

Complementary Course II

CO 1231/CX 1231/CC 1231 : BUSINESS MATHEMATICS

(Common for Commerce/Commerce and Tax Procedure and Practice/Commerce with Computer Applications)

(2018-2019 Admission)

Time : 3 Hours Max. Marks : 80

PART – A

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

1. Evaluate $\frac{3}{8}+\frac{4}{5}-\frac{7}{12}$.

2. Find the largest number in the following $\frac{3}{6}, \frac{4}{12}, \frac{5}{9}$ and $\frac{7}{16}$.

3. Find the fraction equivalent to 0.3434....

4. Find the value of $6^2+12*5-\frac{4}{2}+7-2*4$.

5. Write down the identity matrix of order 3.

6. Find $6C_4$.

7. Find $\frac{dy}{dx}$ if $y = 5x^2 + e^{3x}$.

8. Evaluate $\int (x^2 + 2x + 3)dx$.

9. What are accelerated depreciation methods?

10. The exchange rate of EURO/INR is 86. A European tourist wants to purchase a handicraft costing Rs. 17,200 from Kerala. How much Euro should he pay?

(10 × 1 = 10 Marks)

PART – B

Answer **any eight** questions. Each carries **2** marks.

11. Sam spent 1/6 of his Sunday doing homework and 1/2 of the day watching cricket. What part of the day was left to do other things?

12. If $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & 1 & 2 \\ 3 & 2 & 5 \end{bmatrix}$, find $2A + 3B$.

13. If $A = \{1, 2, 3, 4, 5\}$ and $B = \{2, 4, 6, 7\}$, find $A \cup B$ and $A \cap B$.

14. Solve the system of linear equations $3x + 2y = 8, 5x - 3y = 7$.

15. If one root of the equation $8x^2 - 6x + k = 0$ be square of the other, prove that $k = 1$ or -27.

16. Find the number of words that can be made with all the letters of the word MATHEMATICS.

17. Find the derivative $\frac{dy}{dx}$ if $y = x^2 \log x$.

18. Find the adjoint of the matrix $\begin{bmatrix} 1 & 2 & 3 \\ 1 & 3 & 3 \\ 1 & 2 & 4 \end{bmatrix}$.

19. The following data gives the import of India in different years. Construct a simple bar diagram.

Years	1984	1985	1986	1987
Import in crore of Rs.	576	657	707	850

20. Convert 9.66666.... into fractions.

21. The scrap value of a machine costing Rs. 10,000 at the end of 10 years is equal to Rs. 2,785. Find the rate of depreciation.

22. Zen Ltd. manufactures a single product with a sale price of ₹ 16 per unit and a variable cost of ₹ 10 per unit. Fixed costs are ₹ 48,000 p.a. Calculate break even point in units and sales.

(8 × 2 = 16 Marks)

PART – C

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

23. Convert 12.7623623623....to a fraction.

24. Find the value of the determinant $\begin{bmatrix} 1 & 1 & 1 \\ 2 & 3 & 4 \\ 1 & 2 & -4 \end{bmatrix}$.

25. Solve using cross multiplication $2x - y = 13, -x + 2y = -11$.

26. In how many ways can seven people be arranged at a round table so that two particular persons may be together?

27. Find $\frac{dy}{dx}$ if $y = \frac{2x^2 + 3}{\sqrt{x}}$.

28. Evaluate $\int \left(3\sqrt{x} + 5 + \frac{2}{x}\right) dx$.

29. If one root of the equation $x^2 - 8x + k = 0$ exceeds other by 4 ,find the value of k?

30. A man purchased a house valued at Rs 3,00,000. He paid Rs 2,00,000 at the time of purchase and agreed to pay the balance with interest of 12% per annum compounded half yearly in 20 equal half yearly instalments. If the first instalment is paid after six months from the date of purchase, find the amount of each instalment.

31. The salary of a private bus conductor consists partly of a fixed sum and partly of commission which varies as the value of sale of tickets. In two consecutive months he sells tickets worth Rs. 2,000 and Rs.2,500 respectively and receives Rs. 420 and Rs. 445 respectively as salaries for those two months. If his salary for a particular month becomes Rs. 500. What is the value of the tickets sold by him in that month?

(6 × 4 = 24 Marks)

PART – D

Answer **any two** questions. Each carries **15** marks.

32. (a) Find A^{-1} if $A = \begin{bmatrix} 3 & -3 & 4 \\ 2 & -3 & 4 \\ 0 & -1 & 1 \end{bmatrix}$.

(b) Solve the system of equations using matrix method.

$x + y + z = 6,\ x - y + z = 2,\ 2x + y - z = 1.$

33. (a) Draw a suitable pie diagram for the following data.

Year	Coarse	Medium	Fine	Total
Production of cotton in 1960	60	26	14	100
Production of cotton in 1970	132	48	16	196

(b) A box contains 2 red, 3 black and 5 white balls. If 3 balls are drawn at random without replacement, find the probability that all the three are black?

34. (a) Find $\frac{dy}{dx}$ if $y = \sin(e^x \log x)$.

(b) If $z = 2x^2 - 3xy + 5y^2 + 7$ find $\frac{\partial z}{\partial x}$ and $\frac{\partial z}{\partial y}$.

35. (a) Calculate (i) Creditors Turnover Ratio and (ii) Average Payment Period from the following data:

Cash purchases Rs. 1,40,000

Purchases returns Rs. 20,000

Total Purchases Rs. 10,00,000

Opening creditors Rs. 1,20,000

Closing creditors Rs. 90,000

Opening bills payable Rs. 30,000

Closing bills payable Rs. 40,000

Assume 360 days in a year.

(b) On retirement from services two persons A and B are awarded yearly pensions in proportion to the number of years they have served. A served 8 years longer than B and received Rs. 400 p.m. more in pension. Had the length of service A exceeded that of B by 12 years, his monthly pension would have been exactly double of B. How long did each of them serve and what were their respective pensions?

(2 × 15 = 30 Marks)
