Reg. No. : ....

Name : ....

Second Semester B.Com. Degree Examination, May 2020

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)
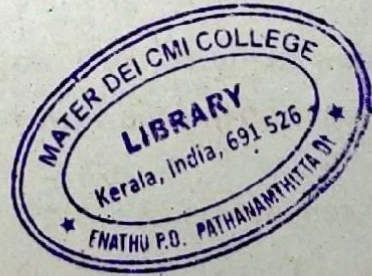
(2018 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – A

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

1. What is quadratic equation?

2. What is pie-diagram?

3. What is combination?

4. What do you mean by integration?

5. What do you mean by complement of a set?

6. Solve: $5x^2 - 125 = 0$.

7. What is skew symmetric matrix?

P.T.O.

8. What is discriminant of quadratic equation?

9. What is interpolation?

10. What do you mean by present value?

(10 × 1 = 10 Marks)

SECTION – B

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

11. Prove that the determinant of the following matrix is non-singular?

$$A = \begin{bmatrix} 3 & 1 & 2 \\ 4 & 3 & 1 \\ 1 & 1 & 5 \end{bmatrix}.$$

12. State the distributive law of set.

13. 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.

14. Define intersection of two sets.

15. In how many different ways can be letters of the word 'CORPORATION' be arranged so that the vowels always come together?

16. Differentiate the following with respect to x?

$(4x - 3)^5$

17. What is the effective rate of interest corresponding to a nominal rate of 5% p.a. If interest is compounded quarterly.

18. Monthly incomes of two persons are in the ratio of 5:7 and their monthly expenditures are in the ratio of 7:11. If each saves Rs.150 a month, find their monthly incomes.

19. From the following information, calculate Average payment period:

    Total purchases: Rs. 2,00,000, Cash purchases: Rs.20,000, Purchase returns: 34,000, Trade creditors at the end: Rs.70,000, Bills payable at the end: 40,000.

20. Find the present value of an amount of Rs.8,000 deposited now in a commercial bank for a period of years @12% rate of interest.

21. Briefly explain the Double Declining Balance method.

22. If Rupee Dollar rate is 46/ 46.15, Dollar Pound rate is 1.71/1.74,What is Rupee Pound rate?

$(8 \times 2 = 16$ **Marks**)

SECTION –C

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

23. Find the production for the year 2005 with the help of the following data:

Year	1980	1985	1990	1995	2000	2005	2010
Production (m.tons)	20	22	26	30	35	?	43

24. Examine the general rules to be followed for constructing diagrams.

25. In how many ways can 5 Kannada, 3 Hindi and 3 Malayalam books be arranged if the books of each different languages are kept together?

26. Show that if the square of any integer is even, the integer itself is even.

27. Using Cramer's rule, solve the following system of equations
    $x + y + z = 6$, $2x - y + z = 3$, $x - 2y + 3z = 6$.

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28. Find two natural numbers such that their sum is 24 and product 95?

29. Find X and Y if

$$X + Y = \begin{bmatrix} 4 & 5 \\ 9 & 2 \end{bmatrix} \text{ and } X - Y = \begin{bmatrix} 6 & 3 \\ 11 & 4 \end{bmatrix}.$$

30. Selling price per unit Rs.10, Variable cost per unit Rs.6, Fixed cost Rs.2,000 and Actual sales Rs.20,000. Calculate Breakeven point in units, Break even point in value and Break even point in percentage?

31. Differentiate the following w.r. to x

$$x^{\sin x} + (\sin x)^x.$$

(6 × 4 = 24 Marks)

SECTION –D

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

32. Out of 880 boys in a school, 224 played cricket, 240 played hockey and 336 played basket ball: of the total, 64 played both basket ball and hockey: 80 played cricket and basket ball and 40 played cricket and hockey; 24 played all the three games.

    (i) How many boys did not play any game and

    (ii) How many boys played only Hockey?

    (iii) How many played only cricket?

33. Following is the Profit and Loss Account for the year ended 31-3-2019 and Balance sheet as on that date in summarized form:

Dr	Trading and P/L account			Cr
Particulars	Amount	Particulars		Amount
To opening stock	76,250	By sales		5,00,000
Purchases	3,22,250	Closing stock		98,500
Gross profit	2,00,000			
Total	5,98,500			5,98,500

Dr			Cr
Particulars	Amount	Particulars	Amount
To selling and distribution expenses	22,000	Gross profit	2,00,000
Loss on sale of assets	2,000	Dividend on shares	9,000
Office expenses	98,000	Profit on sales of shares	3,000
Net Profit	90,000		
Total	2,12,000	Total	2,12,000

Balance sheet as at 31.3.2019

Liabilities	Amount	Assets	Amount
Share capital 2,600 equity shares of Rs.100 each	2,60,000	Land and Buildings	1,50,000
Reserves	70,000	Plant and Machinery	80,000
Profit and Loss A/c.	20,000	Stock in trade	98,500
Current liabilities	1,30,000	Sundry debtors	61,500
		Bills receivable	60,000
		Bank	30,000
Total	4,80,000		4,80,000

Calculate

(a) Turnover of fixed assets

(b) Operating Profit Ratio

(c) Operating Ratio

(d) Current Ratio

(e) Stock turnover Ratio

34. A party of 3 ladies and 4 gentlemen is to be formed from 8 ladies and 7 gentlemen. In how many different ways can the party be formed if Mrs.X and Mr. Y refuse to join the same party.

35. (a) At what time will a sum of Rs.1234 amount to Rs.5678 at 8% p.a. compound interest, payable quarterly.

(b) A machine, the life of which is estimated to be 10 years, costs Rs.10,000. Calculate its scrap value at the end of its life, depreciation on the reducing instalment system being charged at 10% p.a.

(2 × 15 = 30 Marks)

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