

B.B.A. (CBCS) DEGREE EXAMINATION, APRIL 2021
SECOND SEMESTER
BUSINESS ADMINISTRATION - MAIN
BUSINESS MATHEMATICS
(For those who joined in July 2017 onwards)

Time: Three hours

Maximum : 75 marks

PART - A (10X1=10 marks)

Answer all the Questions Choose the Correct answer

Choose the correct answer.

1. If A(-3, 3) and B(5, 9) then the distance between A and B is
 - a) 0
 - b) 1
 - c) 10
 - d) None of the above
2. All points on a plane have reference to a point. It is called
 - a) Origin
 - b) Quadrant
 - c) Co-ordinate
 - d) None of the above
3. The differential coefficient of e^{2x} with respect to x is
 - a) $2e^{2x}$
 - b) e^x
 - c) $2e^x$
 - d) None of the above
4. Let $y = 3x - 6$, the elasticity of y with respect to x if $x = 8$ is
 - a) 4
 - b) 1.2
 - c) 3
 - d) None of the above
5. The maximum and minimum values of a function are called the ----- values of the function.
 - a) Extreme
 - b) Middle
 - c) Absolute
 - d) None of the above
6. When the tangent crosses the curve, at such a point $d^2y/dx = 0$ and such point is called
 - a) Point of inflexion
 - b) Maximum point
 - c) Minimum point
 - d) None of the above
7. The interest for one unit of time is multiplied by the number of units of time under
 - a) Simple interest
 - b) Compound interest
 - c) Annuity
 - d) None of the above
8. Under this method interest earns interest
 - a) Simple interest
 - b) Compound interest
 - c) True discount
 - d) None of the above
9. If a matrix has only one row, then that matrix is called
 - a) Diagonal matrix
 - b) Row matrix
 - c) Column matrix
 - d) None of the above

10. A system of linear equations is said to be consistent if it has ----- solution/s.

- a) At least one
- b) Two
- c) Three
- d) None of the above

PART - B (5X5=25 Marks)

Answer ALL questions choosing either (a) or (b) in 250 words.

11. a) Find the equation of the straight line which passes through the points (2, -1) and (4, 5).

(OR)

b) The fixed cost is Rs.60,000 and cost increases by Rs.2.50 for each Rs.4 increase in sales. Find the break even point.

12. a) Find the differential coefficient of y with respect to x ; when $y = (x^2+5)^{3/2}$

(OR)

b) The total cost C of making x units of product is $C = 0.00003x^3 - 0.045x^2 + 8x + 25,000$. Find the marginal cost at 1000 units of output.

13. a) Examine the function $y = 22x^3 - x^2 + 5$ for maximum and minimum.

(OR)

b) The total revenue function is given by $R = x + 3x^2$. Find the marginal revenue and demand function.

14. a) The difference in simple and compound interests on a sum of money at 15% p.a. for 2 years is Rs.144. Find the sum.

(OR)

b) How many annual payments of Rs.50 each are needed to accumulate Rs.1,000, if the interest is 5% compounded annually?

15. a) Show that $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$ satisfies the equation $A^2 - 4A - 5I = 0$

(OR)

b) Find the inverse of $A = \begin{bmatrix} 2 & 2 \\ 3 & 5 \end{bmatrix}$

PART - C (5X8=40 Marks)

Answer ALL questions choosing either (a) or (b) in 600 words.

16. a) Find the intercepts of the line $9x + y + 18 = 0$ with the coordinate axes. Do the points (-2, 0), (0, -18), and (-4, 18) lie on the line?

(OR)

- b) A company expects that total fixed cost will be Rs.25,000 and that variable cost will be Rs.75,000 on sales of Rs.1,25,000.
- Find the relation between total cost and sales.
 - Find the break even point.
 - What will be the profit for sales of Rs.1,00,000?

17. a) Find the differential coefficient of y with respect to x ; when
- $y = (x^2+1)(3x^2-2x^3)$ and
 - $y = \log_a(x^2+1)$

(OR)

- b) A television manufacturer produces x units in a production run at a total cost of manufacturing and stocking given by $C = 25x + 10^8/x$
- Find dC/dx
 - Find the value of x at which $dC/dx = 0$

18. a) A telephone company has a profit of Rs.2 per telephone when the number of telephones in the exchange is not over 10,000. The profit per telephone decreases by 0.01 paise for each telephone over 10,000. What is the largest possible profit?

(OR)

- b) A rectangular field is y metres long, x metres wide. What is the minimum amount of fence which will enclose 10,000 square metres?
19. a) A person deposits Rs.5,000 every year with a company which pays him interest at 12% per annum. He allows his deposits to accumulate with the company at compound interest. What would be the amount stands to his credit on year after he has made his deposit for 15th time?

(OR)

- b) If an investor plans investing Rs.100 per year in a savings plan that earns 5% interest per annum compounded annually. What is the sum of annuity payments at the end of 10 years?
20. a) Find AB and BA When

$$A = \begin{bmatrix} 2 & -3 & -5 \\ -1 & 4 & 5 \\ 1 & -3 & -4 \end{bmatrix} \quad \text{and} \quad B = \begin{bmatrix} -2 & 6 & 10 \\ 2 & -6 & -10 \\ -2 & 6 & 10 \end{bmatrix}$$

(OR)

- b) Solve by inverse matrix method

$$2x - y + 3z = 7$$

$$x + 3y - z = 8$$

$$x + y - 4z = 1$$
