E 2367 (Pages : 2) Reg. No.................................

Name.....................................

B.A. DEGREE (C.B.C.S.S.) EXAMINATION, MAY 2018

Second Semester

MATHEMATICS FOR ECONOMICS—II

(For B.A. Corporate Economics)

[2013 to 2016 Admissions]

Time : Three Hours Maximum Marks : 80

Part A

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

Define the following :

1. Logarithmic function.
2. Partial derivatives.
3. Convexity.
4. Dependent variable.
5. Monopoly equilibrium.
6. Profit maximisation.
7. Linear homogenous function.
8. Bliss point.
9. Marginal rate of technical substitution.
10. Price Elasticity of demand.

$(10 \times 1 = 10)$

Part B

Write short notes on any **eight** *of the following.*
Each question carries 2 marks.

11. Find the derivative of $\log\left(ax^3 - b\right)$.

12. Briefly explain types of functions.

13. Find the elasticity demand with respect to price for the given demand function $Q = \dfrac{9}{p^2 - 1}$, when the price is Rs. 7.

14. Write a note on application of derivatives in Economics.

15. What is meant by integration explain with example ?

16. Find out the first order derivative for $Y = 40 - 5x + x^2$.

17. Briefly analyse exponential function.

18. Write any five rules of differentiation.

19. Explain the concepts of maxima with diagrammatic illustration.

20. What is meant by producer's surplus ?

Turn over

21. State and explain the concept of MRTS (Marginal Rate of Technical Substitution).

22. Briefly explain the conditions of equilibrium of firm under perfect competition.

$(8 \times 2 = 16)$

Part C

Answer any **six** *of the following.*
Each question carries 4 marks.

23. Analyse the Mathematical concept of minima with the help of graphical presentation.

24. Examine whether $-3x^2y + 2xy + 3y^3$ is homogenous or hetrogenous.

25. Test whether $y = -4x^3 + 16x^2 + 9x - 15$ is concave or convex at $x = 3$.

26. Difference between Fixed cost and Variable cost.

27. Find $\dfrac{dy}{dx}$ of the following :—

   (a) $\sqrt{x} + \sqrt{y} = \sqrt{a}$.

   (b) $y = 7x^4 + 5x^3 + 4$.

28. Briefly explain the concept of inflexion in the light of concavity and convexity.

29. Find out marginal cost of the following :

   (a) $TC = 4Q^3 - 3Q^2 + 10$.

   (b) $TC = 5 + 7Q^3 + 4Q$.

30. Difference between Superior commodity and Inferior commodity.

31. Find out the equilibrium price and quantity with a given cost function :

   $c(x) = x^3 + 5$, demand curve $x = 15p$.

$(6 \times 4 = 24)$

Part D

Answer any **two** *of the following.*
Each question carries 15 marks.

32. Differentiate the following and find $\dfrac{dy}{dx}$:

   (a) $Y = x^3 + (\log x)^2$.

   (b) $Y = 5 + 7x^5 - 2x^2$.

   (c) $\cos^{-1}(5x^5 - 4x^2 + 3x)$.

33. What do you mean by elasticity of demand ? Briefly explain various types of elasticity demand with diagrams.

34. Explain some concepts of economic theory by using derivatives and integration with examples.

35. Under perfect competition if price $(p) = 5$ and $c = 150 + \dfrac{15x^3}{100}$ find out maximum profit and equilibrium condition for the firm or industry.

$(2 \times 15 = 30)$