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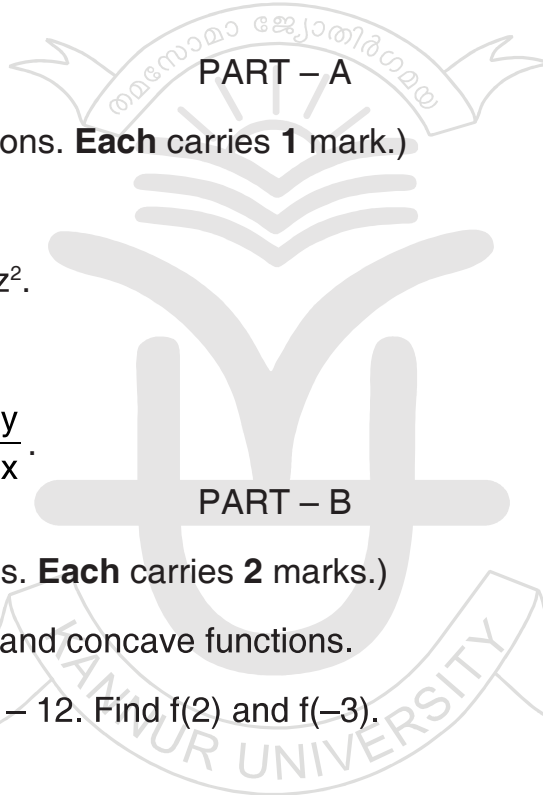
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**I Semester B.A. Degree (C.B.C.S.S. – Supplementary)
Examination, November 2022
(2016-2018 Admissions)
COMPLEMENTARY COURSE IN ECONOMICS/DEVELOPMENT
ECONOMICS
1C01 ECO : Mathematics for Economic Analysis – 1**

Time : 3 Hours

Max. Marks : 40

PART – A

(Answer **all** the **4** questions. **Each** carries **1** mark.)　　　　　　　　**(4×1=4)**

1. Define function.

2. Simplify $13yz^2 – 38yz^2$.

3. $\lim\limits_{x \to 2} 6 =$

4. Given $y = 6x^{-3}$ find $\dfrac{dy}{dx}$.

PART – B

(Answer **any 7** questions. **Each** carries **2** marks.)　　　　　　　　**(7×2=14)**

5. Differentiate convex and concave functions.

6. Given $f(x) = 2x^2 + 3x – 12$. Find $f(2)$ and $f(–3)$.

7. $\lim\limits_{x \to 2} \left(2x^3 + 3x\right) =$

8. Given $y = \dfrac{9}{x}$. Find $\dfrac{dy}{dx}$.

9. Differentiate the functions :
   a) $R = 6t^2 + 3t + 12$
   b) $Z = 7x^2 – 2x^{-3}$.

10. Find the marginal cost function from the total cost function $TC = 5Q^2 + 7Q + 12$.

11. Find the first order partial derivatives of the function $Z = 9x^3 + 12x^2y – 7y^5$.

P.T.O.

12. Find the second order derivative of the function $Y = 5x^3 + 7x^2 + 3x + 18$ and evaluate it at $x = 2$.

13. Explain L' Hospital rule.

14. Given $z = f(x, y) = 6x^3 + 7y$ where $y = g(x) = 4x^2 + 3x + 8$. Find the total derivative $\dfrac{dz}{dx}$ with respect to x.

PART – C

(Answer **any 4** questions. **Each** carries **3** marks.)   **(4×3=12)**

15. Find whether the function $f(x) = \dfrac{x - 3}{x^2 - 9}$ is continuous at $x = 3$.

16. Draw the graph of the demand function $Qd = 20 - 4p$.

17. Differentiate the function using quotient rule $Y = \dfrac{5x - 2}{6x + 3}$.

18. Find the first order and second order partial derivative of the function $f(x, y) = x^{0.2} \, y^{0.3}$.

19. Find the partial derivative of the function $Z = (8x - 3y)^6$.

20. Given $C = 2000 + 0.75 \, Yd$ where $Yd = Y - T$ and $T = 120$. Use derivative to find MPC.

PART – D

(Answer **any 2** questions. **Each** carries **5** marks.)   **(2×5=10)**

21. Explain the application of derivatives in economics.

22. Maximise the profit for a firm given total revenue $R = 4000Q - 33Q^2$ and total cost $C = 2Q^3 - 3Q^2 + 400Q + 5000$, assuming $Q > 0$.

23. Find MC and AC function from the following TC function and evaluate it at $Q = 2$ and $Q = 5$ $TC = 40 + 8Q - 3Q^2 + 5x^3$.

24. Find the first order partial derivative for the following functions
    a) $Z = 2x^2 (6x + 8y)$
    b) $Z = (3x - 5y) (7x + 3y)$.

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