

# HOME ASSIGNMENT

1<sup>st</sup> Semester (Honours)

Subject: Economics

Paper: ECO-HC-1026 Mathematical Methods for Economics – I

Total Marks: 20

Last Date of Submission: 20<sup>th</sup> December, 2021

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1. Give short answers: **1 X 4 = 4**
- (a) Write the product rule of differentiation.
- (b) What is the relation between AR, MR and Elasticity of Demand ( $e_d$ ).
- (c) If  $y=e^{ax}$ , then what will be its derivative value?
- (d) If total cost (TC) function of a firm is  $TC = 3Q^2 - 7Q + 100$ , find the marginal cost (MC) function.
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2. Find the derivatives of the following functions: **3 X 3 = 9**
- (A)  $(4x^3 + 3x^2 - x + 3)^3$
- (B)  $\frac{(3x^2 - 2x)}{(4x + 1)}$
- (C)  $(x^3 + 3x)(2x^2 - 2x + 20)$
3. The total cost C of a firm is given by
- $$C = 1000 + 100q - 80q^2 + \frac{1}{3}q^3 \quad \mathbf{3}$$
- Where  $q$  is the quantity produced.
- (i) Find the marginal cost of production.
- (ii) At what value of  $q$  does marginal cost equal average variable cost?
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4. The total revenue function of a firm is given by  $TR = 200Q - 5Q^2$
- Find out the elasticity of demand when  $Q = 2$ . Also comment on the type of the product. **4**