

- (ii) Find the inverse of the following matrix  $B$  :

$$B = \begin{bmatrix} 2 & 0 & -5 \\ 4 & 1 & 2 \\ -3 & 0 & 1 \end{bmatrix}$$

- (iii) Given

$$A = \begin{bmatrix} 2.1 & 3.2 & 0.1 \\ 5.3 & 1.7 & 2.6 \end{bmatrix} \text{ and } B = \begin{bmatrix} 4 & 1 \\ 2 & 3 \\ 1 & 5 \end{bmatrix}$$

Find  $AB$ .

5. (a) (i) In a perfectly competitive market, the price of a product ( $q$ ) is  $\Sigma 4$  and the total cost ( $c$ ) of a firm is  $c = q^3 - 15q^2 + 31q + 500$ . Find the profit maximizing output and maximum profit.

- (ii) If the total productivity is given by

$$Q = \frac{L^2 - K}{L + K^2}$$

find the marginal productivity of  $L$  and  $K$ .

3+3=6

Or

- (b) (i) Given the consumption function

$$C = 2000 - \frac{6000}{(5+Y)}$$

find the marginal propensity to consume when  $Y = 95$ .

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- (ii) Prove that the elasticity of substitution is equal to one in case of CD production function.

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6. (a) (i) Briefly discuss the uses of integral calculus in Economics.

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- (ii) Obtain the consumer's surplus of the following demand function when the market price is  $\text{£} 16$  per unit :

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$$Q = \sqrt{16 - \frac{3}{2}P}$$

Or

- (b) (i) Find the integral of  $\int x e^x dx$ .

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- (ii) The marginal revenue and marginal cost functions of a firm are  $MR = 20 - 2Q$  and  $MC = 6Q^2 - 4Q + 5$  respectively. The total fixed cost is  $\text{£} 20$  when it sells 4 units of produce. Find the total profit of the firm.

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