



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
**FACULTY OF SOCIAL SCIENCES**  
**DEPARTMENT OF ECONOMICS**  
**2025\_2 EXAMINATIONS**

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**SUBJECT TITLE: ADVANCED MATHEMATICS ECONOMICS**

**SUBJECT CODE: ECO459**

**TIME ALLOWED: 2 HOURS**

**INSTRUCTIONS: ANSWER QUESTIONS ONE AND ANY OTHER TWO QUESTIONS.**

**QUESTION 1**

- (a). What is the role of optimization in economic theory and decision-making? **(10marks)**
  - (b). Examine the scope and significance of dynamic economics. **(10marks)**
  - (c). Given the demand function  $P=100-P$  and the supply function  $P=2P-20$ , determine the equilibrium price and quantity. **(10marks)**
- (30MARKS)**

**QUESTION 2**

If the marginal revenue function for a commodity is  $(3q^2 - 6q + 2)$  naira per units when the level of production is  $q$  units, determine the total revenue function and find the total revenue when 20 units are sold.

**(20MARKS)**

**QUESTION 3**

- (a). Differentiate  $y = \sin(2x - 4)$  wrt  $x$ . **(10marks)**
- (b). Given  $2^{x-1} \times 4^{x-4} \times 16^{x-1} = 32^x \times 64^{2x+1} \times 128^{1+2x}$ , Find  $x$ . **(10marks)**

**(20MARKS)**

**QUESTION 4**

(a). How do difference equations and differential equations differ in their application to modeling real-world systems? **(10marks)**

(b). What are the implications of the order of difference equations and differential equations for their solutions? **(10marks)**

**(20marks)**