NATIONAL OPEN UNIVERSITY OF NIGERIA
FACULTY OF SOCIAL SCIENCES
DEPARTMENT OF ECONOMICS
2021_1 EXAMINATION

COURSE TITLE: **ADVANCED MATHEMATICAL ECONOMICS**
COURSE CODE: **ECO 718**
UNITS: **2 UNITS**
TIME ALLOWED: **2 HOURS**

INSTRUCTION: ANSWER ANY THREE QUESTIONS. AWARD ONE MARK FOR CLARITY

1. In a market survey involving three commodities A, B and C, some fixed weights were assigned to the three varieties in each of the commodities. The table below provides the information regarding the consumption of three commodities according to the three varieties and also the total weight received by the commodity. Find the weights assigned to the three varieties using Cramer's rule. **(23 Marks)**

Commodity / Variety	Variety			Total weight
	I	II	II	
A	1	2	3	11
B	2	4	5	21
C	3	5	6	27

2. Given the demand function of a firm as: $Q = \frac{8-P}{2}$.

Find:

i. Total Revenue (TR) function **(7 Marks)**
ii. Marginal Revenue (MR) function **(6 Marks)**
iii. Quantity and price optimizing levels. **(10 Marks)**

3. D & N enterprise specializes in the production of sachet tomatoes and has it marginal cost as: $MC = 500 + 20Q - Q^2$. If the fixed cost is 350, Find:

i. Variable Cost **(10 Marks)**
ii. Cost of producing 50 units (**13 Marks)**

4. Consider the demand and supply functions,

$Qd = 175 - 0.2P$
$Qs = 120 + 0.5P$

Calculate:

i. The consumer surplus **(9 Marks)**
ii. The producers surplus **(9 Marks)**
iii. Total collective gain **(5 Marks)**