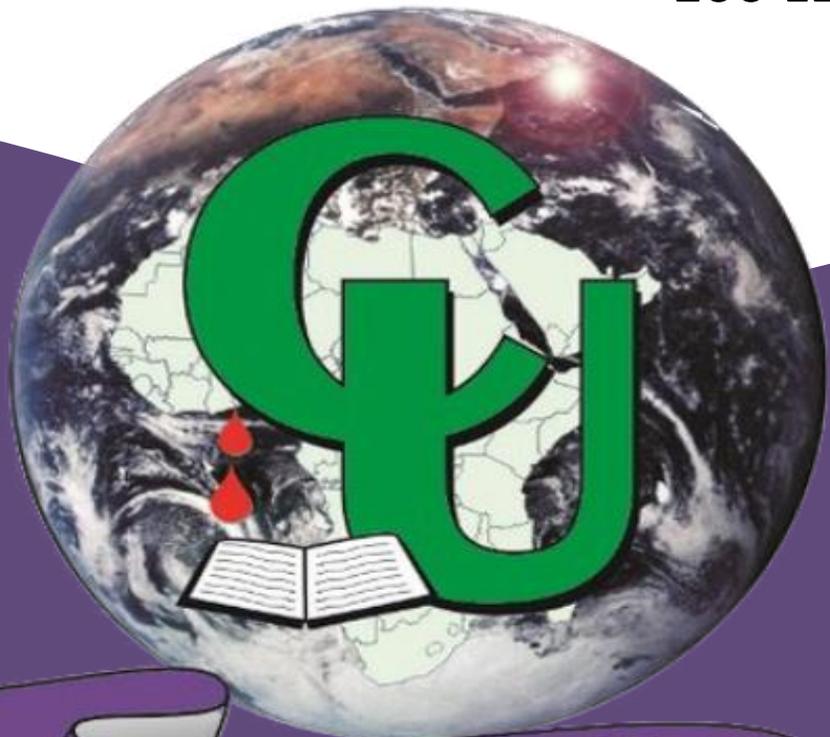


COVENANT UNIVERSITY

ALPHA SEMESTER TUTORIAL KIT
(VOL. 2)

PROGRAMME: ECONOMICS

100 LEVEL



Raising A New Generation Of Leaders

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LIST OF COURSES

CBS111: Mathematics for Business and Social Sciences I

ECN111: Introduction to Economics I (Micro)

COVENANT UNIVERSITY
CANAANLAND, KM. 10 IDIROKO ROAD
P.M.B., 1023, OTA, OGUN STATE, NIGERIA

TITLE OF EXAM; B.SC DEGREE EXAMINATION

COLLEGE; CBS **DEPARTMENT;** ECONOMICS AND DEVELOPMENT STUDIES

SESSION; 2014/2015 **SEMESTER;** ALPHA

COURSE CODE; CBS111 **COURSE TITLE;** MATHEMATICS FOR BUSINESS & SOC SC

INSTRUCTION; ANSWER QUESTION 1 AND ANY OTHER THREE

TIME ALLOWED ; 2 HOURS

1a) A small swimming pool can be filled by two pipes in three hours. If the larger pipe alone takes 8 hours less than the smaller pipe to fill the pool, find the time in which it will be filled by each pipe singly. (5 marks)

b) Evaluate $\frac{2-i}{2+i}$ (5 marks)

c) Solve for x if $\sqrt[4]{2x+2} - 1 = 0$ (5 marks)

d) Solve for x if $3^{x+5} = 3^{x-3} + \frac{8}{3}$ (5 marks)

e) A University has 237 employees of these 205 participate in at least one of the University's two payroll savings plans. If 176 participate in plan A and 130 participate in plan b, how many participate in both payroll saving plan? (5 marks)

Total25 marks

2a) Find the value of n if $n_{p_4} = 12^n p_2$ (10 marks)

b) In how many ways can 4 boys and 5 girls be arranged in a row so that all the 4 boys are together? (5 mks).

Total15 marks

3a) The second term of an AP is nine times the fifth and the sum of the first eight terms is 56. Find

i) The first term and the common difference

ii) The least number of terms of the AP which must be taken for the sum to be negative. (10 marks)

3b) The sum of two numbers is 16. The difference is 4. What are the two numbers? (5 marks)

Total15 marks

4a) Solve for x in $7^{x+7} = 49^{4x-7}$ (5 marks)

4b) Solve for x in $x^{\sqrt{x}} = (x\sqrt{x})^x$ (5 marks)

4c) A ball is dropped from a height of 8 feet. The ball bounces to 80% of its previous height with each bounce. How high does the ball bounce on the 15th bounce?
(5 marks)

Total15 marks

5a) A loan of N3250 is to be repaid by paying N20 in the first month, increasing per month by N15 in subsequent month. How many months will it take to repay the loan?
(7 marks).

b) In how many ways can 4-digit numbers greater than 4012 be formed using the digits 0,1,3,4,5?

i) If repetition is not allowed ii) if repetition is allowed (4 marks)

c) Find the number of combinations in the letters of the word MISSISSIPPI, taking 3 different letters at a time. (4 marks)

Total15 marks

2014/2015 CBS111 EXAMINATION: ANSWERS TO ALL QUESTIONS

Solution

1a) Let small pipe = x h

In 1 hour it can fill $\frac{1}{x}$ of the pool

Large pipe = $x - 8$

In 1 hour it can fill $\frac{1}{x-8}$ of the pool

$$\frac{1}{x} + \frac{1}{x-8} = \frac{1}{3}$$

$$\frac{x-8}{x(x-8)} + \frac{x}{x(x-8)} = \frac{1}{3}$$

$$\frac{2x-8}{x^2-8x} = \frac{1}{3}$$

$$3(2x-8) = x^2 - 8x$$

$$6x - 24 = x^2 - 8x$$

$$x^2 - 14x + 24 = 0$$

$$(x-12)(x-2) = 0$$

$$x = 12$$

or

$$x = 2$$

Large pipe = $12 - 8$

= 4 hours

Small pipe = 12 hours.

1b) Evaluate $\frac{2-i}{2+i}$

Solution

$$\frac{2-i}{2+i} = \frac{(2-i)}{(2+i)} \times \frac{(2-i)}{(2-i)}$$

$$= \frac{4 - 2i - 2i + i^2}{4 - 2i + 2i - i^2}$$

$$= \frac{4 - 4i + i^2}{4 - i^2}$$

$$NB : i^2 = -1$$

$$\frac{4 - 4i - 1}{4 - (-1)}$$

$$= \frac{3 - 4i}{4 + 1}$$

$$\frac{3 - 4i}{5}$$

1c) Solve for x if $4\sqrt{2x+2} - 1 = 0$

Solution

$$4\sqrt{2x+2} - 1 = 0$$

$$4\sqrt{2x+2} = 1$$

$$(4\sqrt{2x+2})^4 = (1)^4$$

$$2x + 2 = 1$$

$$2x = 1 - 2$$

$$x = -\frac{1}{2}$$

1d) Solve for x if $3^{x+5} = 3^{x-3} + \frac{8}{3}$

Solution

$$3^{x+5} = 3^{x-3} + \frac{8}{3}$$

$$3^x(3^5 - 3^3) = \frac{8}{3}$$

$$3^x = \frac{8}{3} \times \frac{1}{(243 - 27)}$$

$$= \frac{8}{3} \times \frac{1}{216}$$

$$3^x = \frac{1}{81}$$

$$= \frac{1}{3^4}$$

$$3^x = 3^{-4}$$

$$x = -4$$

1e)

Solution

Given,

$$n(A) = 176$$

$$n(B) = 130$$

$$n(A \cup B) = 205$$

$$n(A \cap B) = 237 - 205 = 32$$

$$n(A) = a + c = 176$$

$$n(B) = b + c = 130$$

But,

$$n(A \cup B) = n(A) + n(B) - n(A \cap B)$$

$$205 = 176 + 130 - c$$

$$205 = 306 - c$$

$$c = 306 - 205$$

$$c = 101$$

101 employees participated in both.

2a) Find the value of n if $n P_4 = 12^n P_2$

Solution

$$\frac{n!}{(n-4)!} = \frac{12n!}{(n-2)!}$$

cross – multiply

$$12(n - 4)! = (n - 2)!$$

$$12(n - 4)! = (n - 2)(n - 3)(n - 4)!$$

Divide both sides by (n-4)!

$$(n - 2)(n - 3) = 12$$

$$n^2 - 5n + 6 = 12$$

$$n^2 - 5n - 6 = 0$$

$$n = 6$$

or

$$n = -1$$

2b)

Solution

The 4 boys are counted as one person so that the number of person is 6.

They can be arranged in 6! Ways.

The four (4) boys can be arranged in 4! Ways

Therefore,

$$\begin{aligned} 6! \times 4! \\ = 17280 \end{aligned}$$

3a) Solution

$$2^{\text{nd}} \text{ term} = 9(5^{\text{th}} \text{ term})$$

$$a + d = 9(a + 4d)$$

$$8a + 35d = 0 \quad \text{----- (1)}$$

Sum to first 8 terms

$$\frac{8}{2}[2a + (8-1)d] = 56$$

$$8a + 28d = 56 \quad \text{----- (2)}$$

Solving equations (1) and (2) simultaneously

$$d = -8$$

$$a = 35$$

Let the least number of terms be n

$$\frac{n}{2}[2(35) + (-8)(n-1)] < 0$$

$$n(39 - 4n) < 0$$

$$39n - 4n^2 < 0$$

$$n > 9\frac{3}{4}$$

The least number of terms = 10.

3b) The sum of two numbers is 16. The difference is 4. What are the two numbers?

Solution

Let 1st number be x

Let 2nd number be y

$$x + y = 16 \dots\dots\dots(1)$$

$$x - y = 4 \dots\dots\dots(2)$$

$$2x = 20$$

$$x = 10$$

$$10 + y = 16$$

$$y = 16 - 10$$

$$y = 6$$

Therefore, $x = 10$ and $y = 6$.

4a) Solve for x in $7^{x+7} = 49^{4x-7}$

Solution

$$7^{x+7} = 49^{4x-7}$$

$$7^{x+7} = 7^{2(4x-7)}$$

$$x+7 = 2(4x-7)$$

$$x+7 = 8x-14$$

$$7x = 21$$

$$x = 3$$

4b) Solve for x in $x^{\sqrt{x}} = (x\sqrt{x})^x$

Solution

$$x^{\frac{1}{2}} = x^{\frac{3}{2}x}$$

$$x^{\frac{1}{2}} = \frac{3}{2}x$$

$$2x^{\frac{1}{2}} = 3x$$

$$\frac{2}{3}x^{\frac{1}{2}} = x$$

$$\frac{2}{3} = \frac{x}{x^{\frac{1}{2}}}$$

$$\frac{2}{3} = x^{1-\frac{1}{2}}$$

$$\frac{2}{3} = x^{\frac{1}{2}}$$

Square both sides

$$x = \frac{4}{9}$$

4c) Solution

Set up a model for each bounce

6.4, 5.12 ...

$$a_n = a_1 \cdot r^{n-1}$$

$$a_n = 6.4 \times (0.8)^{5-1}$$

$$= 2.62 \text{ feet}$$

5a) Solution

$$a = 20$$

$$d = 15$$

$$S_n = \frac{n}{2}[2a + (n-1)d]$$

$$3250 = \frac{n}{2}[2 \times 20 + (n-1)d]$$

$$3n^2 + 5n - 1300 = 0$$

$$(n-20)(3n+65) = 0$$

$$n = 20$$

5b) Solution

i) 0,1,3,4,5

2	4	3	2
---	---	---	---

$$2 \times 4 \times 3 \times 2 = 48 \text{ ways}$$

ii)

2	5	5	5
---	---	---	---

$$2 \times 5 \times 5 \times 5 = 50$$

Since repetition is allowed, it is possible to have the following numbers

4000 4100

4001 4101

4010 4110

4011 4111

These 8 numbers should be subtracted from 250.

$250 - 8 = 242$ ways.

5c) Solution

There are 11 letters consisting of M,(1111), (SSSS), (P,P)

There are 4 different letters.

$$\begin{aligned} {}^4C_3 &= \frac{4!}{(4-3)!3!} \\ &= 4 \end{aligned}$$



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P.M.B 1023, OTA, OGUN STATE, NIGERIA.

TITLE OF EXAMINATION: B.Sc EXAMINATION

COLLEGE: CBSS

SCHOOL: SOCIAL SCIENCES

DEPARTMENT: ECONOMICS AND DEVELOPMENT STUDIES

SESSION: 2014/2015

SEMESTER: ALPHA

COURSE CODE: ECN 111

CREDIT UNIT: 2

COURSE TITLE: INTRODUCTION TO ECONOMICS I (MICRO)

INSTRUCTION: ANSWER ALL QUESTIONS IN PARTS I AND II, AND EITHER QUESTION 1 OR 2 IN PART III. TIME: 2 HOURS

PART I: PICK THE APPROPRIATE OPTION AND WRITE THE ANSWER IN YOUR ANSWER BOOKLET.

1. If a good is offered to a rational individual for free, he will _____. (a) accept unlimited quantities of the good each time period (b) stop consuming it when its marginal utility begins to increase (c) stop consuming it when its marginal utility begins to diminish (d) stop consuming it when its marginal utility equals zero.
2. A student buys only juice and notebooks. After all of his income is spent, he finds that the last juice he bought gave him 60 units of satisfaction, and the last notebook he purchased gave him 30 units of satisfaction. A bottle of juice cost ₦250 each and books cost ₦60 each. Which of the statements is true? (a) he should buy fewer juice and fewer notebooks (b) he should buy more notebooks and fewer juice (c) he should buy more juice and fewer notebooks (d) he should buy more juice and more notebooks.
3. The law of demand states that _____. (a) quantity demanded is inversely related to price (b) quantity demanded is directly related to income (c) marginal utility is inversely related to quantity consumed (d) demand curves are linear.

4. The consumer's willingness to pay additional naira for time-saving goods depends primarily on_____. (a) the opportunity cost of your time (b) your wealth and property (c) your social status (d) the distance between your home and your workplace.
5. In market economies, most production and consumption decisions are guided by_____. (a) government decree (b) foreign countries (c) monopolists' desires to maximize profits (d) individual choice under the price system.
6. Price elasticity of demand is not influenced by_____. (a) the number of substitutes available (b) the proportion of the consumer's budget spent on the good (c) the units of measurement used for price or for quantity demanded (d) the length of the time period under consideration.
7. Danladi bought 6 packs of noodles last month, when the price was ₦35. This month, when the price of noodles increased to ₦45, he bought only 4 packs of noodles. his price elasticity of demand is_____. (a) -1.2 (b) -1.4 (c) -1.6 (d) -1.8.
8. If a 5% increase in price leads to an 8% decrease in quantity demanded, demand is_____. (a) perfectly elastic (b) elastic (c) unit elastic (d) inelastic.
9. A perfectly elastic demand curve is_____. (a) a horizontal straight line (b) an upward-sloping straight line (c) a downward-sloping straight line (d) a vertical straight line.
10. If a firm facing a perfectly inelastic demand curve raises its price_____. (a) its sales will increase (b) it will lose some, but not all, of its sales (c) its sales will decrease to zero (d) it will still sell exactly the same amount of output as it did at the lower price.
11. Economists distinguish between normal and inferior goods using_____. (a) price elasticity of demand (b) price elasticity of supply (c) income elasticity of demand (d) tax incidence.
12. An inferior good is defined as one for which demand increases as_____. (a) price decreases (b) price increases (c) income increases (d) income decreases.
13. Cross-price elasticity of demand is used to determine whether_____. (a) a product is an inferior or normal good (b) a product is a necessity or a luxury (c) two products are substitutes or complements (d) price and total revenue are directly or inversely related.
14. Negative cross-price elasticity of demand indicates that_____. (a) the products are inferior goods (b) the products are necessity goods (c) the products are luxury goods (d) the products are complements.
15. What is meant by intermediate goods and services? _____. (a) The same as capital goods, such as plant, buildings, vehicles and machinery. (b) Products which one firm buys off another and then uses up in its own products. (c) All inputs bought by firms, including labour and raw materials. (d) All imports.
16. The law of supply shows that the relationship between price and quantity supplied is _____.
 - (a) inverse (b) positive (c) negative (d) neutral.
17. Diamond is an example of a _____ good. (a) Giffen (b) Necessary (c) Veblen (d) Normal.
18. All of the following **except one** are determinants of a shift of the demand curve.
 - (a) Preference (b) Expectations (c) Income (d) Price of the product.

19. The demand curve for salt will be _____. (a) Vertical (b) Horizontal
(c) Downward sloping (d) Upward sloping.
20. The law of demand shows that the relationship between price and quantity demanded is _____. (a) inverse (b) positive (c) negative (d) neutral.
21. When commodities supplied have alternative uses, their supply is termed as _____.
(a) Joint (b) Competitive (c) Composite (d) Derived.
22. The backward bending supply curve is exhibited when _____. (a) $MU_W > MU_L$
(b) $MU_L > MU_W$ (c) $MU_W = MU_L$ (d) $MU_W = 0$ and $MU_L = 0$.
23. All of the following **except one** are exceptions to the law of supply.
- (a) Wage rate (b) Short run supply curve (c) Perishable goods (d) own price.
24. Which of the following is an exception to the law of demand?
- a) Competitive goods b) Giffen goods c) Perishable goods d) Government policy.
25. Movement along the supply curve is caused by _____. (a) Change in demand
(b) Change in supply (c) Change in price (d) Change in environment.

Total = 25marks

PART II: WRITE THE ANSWERS IN YOUR ANSWER BOOKLET.

1. While economic resources are -----, human wants are -----.
2. The basic economic questions are about -----, -----, and -----.
3. An example of normative statement in economics is: -----.
4. Opportunity costs arise as a result of resource scarcity. **True or false?**
5. Economic models do not have to completely describe every aspect of the economy in order to be useful. **True or False?**
6. The economist's assumption of *Ceteris Paribus* means -----.
7. Points within the production possibility curve (PPC) indicate -----.
8. Money has several functions, mention two (a) ----- (b) -----.
9. The treatise called 'The Wealth of Nations' was written by -----.
10. Data are important in economics because they can be used to (i) ----- and -----.
11. Time series data show information about different points in time over the same variable. **True or False?**
12. The equilibrium price clears the market; it is the price at which ----- equals -----.

13. An increase in consumer income will increase demand for a/an ----- good but decrease demand for a/an ----- good.
14. If the price increase of good A increases the quantity demanded of good B, then good B is a ----- good.
15. A change in price can cause a shift of a demand curve. **True or False?**
16. A line diagram showing lower values on the vertical scale associated with higher values on the horizontal scale, describes a ----- relationship.
17. A straight-line diagram can be drawn if we know the ----- and -----.
18. While consumers seek to maximize utility, producers seek to maximize -----.
19. Economic growth is represented by the outward shift of the production possibility curve.
 - **True or false?**
20. 'Air is essential to life but commands no price! Diamond is not essential to life but commands a high price!' This is the paradox of -----.

Total = 20marks

PART III: Answer Either Question 1 or 2

1. (a) What do you understand by demand? (2 marks)
- (b) Discuss three (3) types of supply with valid examples. (9 marks)
- (c) With the aid of suitable diagrams (where necessary), distinguish between the following concepts:
 - (i) Stable and unstable equilibrium. (ii) Giffen goods and Veblen goods.
 - (iii) Minimum price legislation and maximum price legislation.
 - (iv) Excess supply and Excess demand. (14 marks)

Total =25marks

2. (a) Bingo cracker biscuit produced by BISCO Plc is a popular brand consumed by Covenant University students. You are to state the effect (whether rise or fall) on demand and supply when the following occur. (Hint: In both cases, an example each has been done for you). **Please duplicate both Tables in your answer booklet.**

The Demand for Bingo Biscuit

Decreases if:	Increases if:
Income <u>Falls</u>	Income <u>Rises</u>
The price of a substitute -----	The price of a substitute -----
The price of a complement -----	The price of a complement -----
Expected future income -----	Expected future income -----
The price of the biscuit is expected to ----- in the future	The price of the biscuit is expected to ----- in the future
The population -----	The population -----

(5marks)

The Supply of Bingo Biscuit

Decreases if:	Increases if:
The number of biscuit producers <u>Falls</u>	The number of biscuit producers <u>Rises</u>
The price of a substitute in production -----	The price of a substitute in production -----
The price of a complement in production -----	The price of a complement in production -----
The price of a factor of production used to produce the biscuit -----	The price of a factor of production used to produce the biscuit -----
The price of the biscuit is expected to ----- in the future	The price of the biscuit is expected to ----- in the future
A----- technology change in the biscuit production occurs. (Positive, Negative), pick the most suitable option.	A----- technology change in the biscuit production occurs. (Positive, Negative), pick the most suitable option.

(5marks)

b. (i) Given the demand function: $Q = 300 - 3P$, find the elasticity of demand when price is ₦30. (2marks)

(ii) The supply function is given as: $P = 800 - 10Q + \frac{1}{2}Q^2$, find the elasticity of supply when quantity is 20 units. (3marks)

(iii) Comment on your answers in (i) and (ii) above. (1mark)

c. Differentiate change in quantity demanded from change in demand. (4 marks)

d. Prepare a supply function using five (5) determinants of supply and the determinant of quantity supplied. (5 marks)

Total = 25marks

ECN 111: INTRODUCTION TO ECONOMICS I (MICRO)

MARKING GUIDE ALPHA SEMESTER 2014/2015 SESSION

PART I (1mark each)

1. D
2. B
3. A
4. A
5. D
6. C
7. C - Bonus mark
8. B
9. A
10. D
11. C
12. D
13. C
14. D
15. B
16. B
17. C
18. D
19. A
20. A
21. B
22. B
23. D
24. B
25. C

PART II (1mark each)

1. Scarce/Limited; unlimited/insatiable
2. What to produce? How to produce? And For whom to produce? Where to produce?
3. Any example that is a statement of a value judgment of what is good or bad; e.g. the government should embark on more vocational training programmes to create more employment opportunities for the youths.
4. True
5. True
6. All things being equal
7. Inefficiency/unemployment

8. Any other function. A medium of exchange, a store of value
9. Adam Smith
10. Hypothesis testing _suggesting explanation of relationship. Any other use of data
11. True
12. Quantity demanded; quantity supplied
13. Normal; inferior
14. Substitute
15. False
16. Negative
17. Scale; slope
18. Profit
19. True
20. Paradox of value

PART III

QUESTION 1

- (a) Demand is the amount of goods and services that people are **willing and able to buy** at a given price and a particular period of time. **(2 marks)**
- (b) (i) **Competitive Supply:** This occurs when some commodities supplied have alternative uses. For examples, cassava could be used to produce garri, starch or cassava chips; flour can be used to make cake, doughnut, chinchin. **(3 marks)**
- (ii) **Joint or Complementary Supply:** Some commodities can be supplied together from the same source. For example, palm oil, palm kernel, baskets, brooms, comes from palm tree. All these are jointly supplied, because the production of one might bring about the production of others. **(3 marks)**
- (iii) **Composite Supply:** This occurs when many commodities can satisfy a particular want. When this occurs, the sum total of their supply is said to be composite. For example, light or heat could be gotten from electricity, coal or gas. Flour, butter, yeast/baking powder, eggs can be used for baking. **(3 marks)**
- (c)

QUESTION 2

(a) The Demand for Bingo Biscuit

Decreases if:	Increases if:
Income <u>Falls</u>	Income <u>Rises</u>
The price of a substitute FALLS	The price of a substitute RISES
The price of a complement RISES	The price of a complement FALLS
Expected future income FALLS	Expected future income RISES
The price of the biscuit is expected to FALL in the future	The price of the biscuit is expected to RISE in the future
The population DECREASES	The population INCREASES

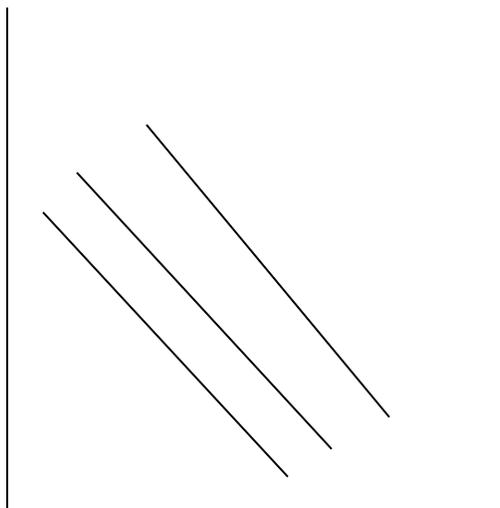
The Supply of Bingo Biscuit

Decreases if:	Increases if:
The number of biscuit producers <u>Falls</u>	The number of biscuit producers <u>Rises</u>
The price of a substitute in production RISES	The price of a substitute in production FALLS
The price of a complement in production FALLS	The price of a complement in production RISES
The price of a factor of production used to produce the biscuit RISES	The price of a factor of production used to produce the biscuit FALLS
The price of the biscuit is expected to RISE in the future	The price of the biscuit is expected to FALL in the future
A NEGATIVE technology change in the biscuit production occurs. (Positive, Negative), pick the most suitable option.	A POSITIVE technology change in the biscuit production occurs. (Positive, Negative), pick the most suitable option.

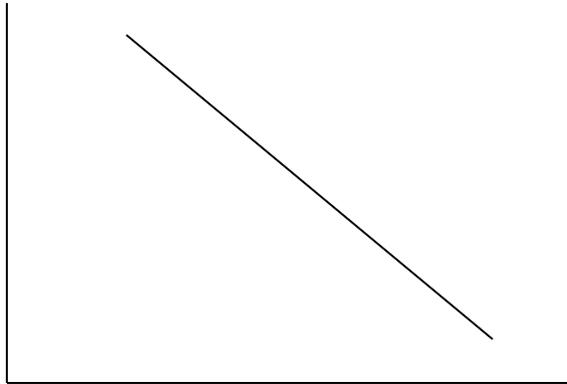
$\frac{1}{2}$ mark for each point. 5marks for each table. $5 \times 2 = 10$ marks)

(b) Differentiate Change in Quantity Demanded from Change in Demand

Change in Demand: A change in demand is caused by a change in the determinants of demand are the factors that influence a change in demand of commodity. It is commonly referred to as a shift in demand. Shifts in demand could either be an increase or a decrease. **(1 mark)**



Change in Quantity Demanded: This simply implies that different quantities are bought as a result of change in the price of the commodity. It is commonly referred to as a movement along the demand curve. **(1 mark)**



(d) Prepare a supply function using five (5) determinants of supply and the determinant of quantity supplied.

$$Q_s = f(P_x, P_1, \dots, P_{n-1}, PC, O, T, G, Ef, W, SP, S) \quad \text{(2 marks)}$$

where;

- (i) P_x – Price of commodity x **($\frac{1}{2}$ mark)**
 - (ii) P_1, \dots, P_{n-1} – Price of other products
 - (iii) PC – Production cost
 - (iv) O – Objective of the firm
 - (v) T – Technique of production
 - (vi) G – Government Policies
 - (vii) Ef – Expectation about Future price
 - (viii) W – Weather
 - (ix) SP – Socio-political conditions
 - (x) S – Seasons
- ($\frac{1}{2}$ mark each for 5 points, total of $2\frac{1}{2}$ marks)**