SOLUTION TO 3RD SEMESTER ENGINEERING ECONOMICS HS 2002 QUESTION PAPER(Dated: 22/09/20)

SECTION A: SHORT ANSWER TYPE

Ans1(a) The percentage increase in its demand = 40% (2X5=10)

- The price elasticity of supply(Es) = 2
- The price elasticity of demand = 2.5> 1 , so elastic.
- The price at which he will demand 40 units of this commodity = or P_2 = 22

Ans 1(b) Students will define 'veblen goods' with examples.

- Students will define 'Giffen Goods' and explain its demand curve.
- Will explain any two factors which causes a shift in the supply curve. (NO DIAGRAMS REQUIRED] .
- Will explain GNP at Market price.

Ans 1(c) They will exaplin MRS.

MRS = 4:1 , 2:1 , 1:1

- Shortage , shortage , equilibrium, surplus and surplus.
- Elastic product , so TR will fall.
- The Income elasticity of the product = ei = 4.16> 1 , so elastic. (By Midpoint method= ep= 4.61)

Ans 1(d) P = 158730

- F = 856912
- F = 385780.50
- Effective rate = r = 12.68

Ans 1(e) (IF COMPLETED AT LEAST TWO COLUMNS , CAN BE ASSIGNED FULL MARKS)

Price of Apples (per kg)	Quantity sold (in kg) per day	Total Revenue (TR)	Average Revenue(AR)	Marginal Revenue (MR)
90	? (10)	900	?(90)	? (900)

80	20	? (1600)	? (80)	? (700)
70	? (30)	2100	? (70)	? (500)
? (60)	? (60)	3600	60	? (1500)
50	? (50)	2500	? (50)	? (1100)

- **Quantity = 56000/800 = 70**
- **Combined demand function = 78 -7P . At P=5 , Qd = 43**
- **n= 27.62**

SECTION B (ANY ONE)

2. (a) (i) Q = 56000 [3]

$$e_P = \frac{dQ}{dP} \times \frac{P}{Q}$$

$$e_P = -2 \times \frac{2000}{56000}$$

e_P = -0.0714

(ii) TR will increase

(b) 20000 – 8P = 8000 + 2P [3]

P = 1200 Q.D/Q.S = 10400

(c)  [4]

3. (a) (i) Q = 76000 [3+3+4]

$$e_Y = \frac{dQ}{dY} \times \frac{Y}{Q}$$

$$e_Y = 4 \times \frac{10000}{76000}$$

$e_Y = 0.526$

(ii) Normal Product

Demand will increase.

(b) $P = 100 - 4Q$

$TR = P.Q = 100Q - 4Q^2$

$$\frac{dTR}{dQ} = MR = 100 - 8Q$$

$MR = 0 \Rightarrow 100 - 8Q = 0$

$Q = 12.5$ & $P = 50$

$Q = 25 - \frac{1}{4}P$

$$e_p = \frac{dQ}{dP} \times \frac{P}{Q}$$

$$e_p = -\frac{1}{4} \times \frac{50}{125} = -1$$

(c) $F = A\left[\frac{(1+i)^n - 1}{i}\right] + P(1+i)^n$

$F = 20000\left[\frac{(1.07)^{20} - 1}{0.07}\right] + 120000(1.07)^5$

$F = 836740.4672$

4. (a) $e = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$ [3+3+4]

$$= \frac{-20}{4} \times \frac{8}{100} = 0.4$$

Or

$\%\triangle$ P = 50%

$\%\triangle$ Q = -20%

E = $\frac{\%\Delta Q}{\%\Delta P} = \frac{20}{50} = 0.4$

Increase the price.

(b) (i)

(ii) $MRS_{xy} = \frac{P_x}{P_y} = \frac{8}{4} = \frac{2}{1}$

(c) A= $F \times \left[\frac{i}{(1+i)^n - 1}\right]$

A = $2000000\left[\frac{.1}{(1.1)^{20} - 1}\right]$

A = 34919.24955

5. (a) Demand increases by 24% for 10% decrease in the price of car. [3+3+4]

Demand decreases by 45% for 30% decrease in Income

Net decrease in demand = 21%

(b) (i) equilibrium

500 – 3P = 2P

5P = 500

P = 100

(ii) Revised supply

Q = 2(P – 10) = 2P – 20

Revised price

500 – 3P = 2P – 20

5P = 520

P = 104

Yes, demand is more elastic.

(c) A = $P \times \left[\frac{i(1+i)^n}{(1+i)^n - 1} \right]$

A = $1000000 \left[\frac{0.06(1.06)^{20}}{(1.06)^{20} - 1} \right]$

A = 87184.55698

6. (a) Train travel will increase i.e. 2.2 x 12 = 26.4% [3+3+4]

(b)

Qty	MU_A/P_A	MU_B/P_B
1	20	16
2	16	15
3	12	12
4	10	11

The consumer will buy 3 units of A and 3 units of B.

(c) A = $A_1 + G \left[\frac{(1+i)^n - in - 1}{i(1+i)^n - i} \right]$

A = 20000 + 1000 $\left[\frac{(1.04)^{12} - .04 \times 12 - 1}{.04(1.04)^{12} - .04} \right]$

A = 25034.34819

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