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Subject : Engineering Economics

Assignment: 02

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QNO. 2.4:

Classify each of the following

① Raw Material → Variable Cost
② Direct labor → Variable Cost
③ Depreriation → Fixed Cost
④ Supplies → Fixed Cost
⑤ Utilities → Fixed Cost
⑥ Property taxes → Fixed Cost
⑦ Administrative Salaries → Fixed Cost
⑧ Payroll taxes → Fixed Cost
⑨ Insurance → Fixed Cost
⑩ Clerial Salaries → Fixed Cost
⑪ Sale Commission → Variable Cost
⑫ Rent → Fixed Cost
⑬ Interest on borrowed money → Fixed Cost

QNO: 2.5

Relationship b/w Cash Cost and cash flow

⊛ Cash Cost:
A cost that involves payment of cash is called cash cost.

⊛ Cash flow:
Cash flow is the net amount of cash and cash equivalent being transferred into and out of business. e.g income taxes (cash cost result in a cash flow).

Q NO: 2.10
Difference b/w Monopoly, oligopoly and competition.

⊛ Monopoly:-

→ One company dominates the industry.
→ That company controls the pricing.
→ Make it almost impossible to start a business.
→ Virtually the only vriable seller.
→ eg Google.

⊛ Oligopoly:-

→ A few companies dominate the industry.
→ Pricing is few but highly influeced by elite few.

→ Difficult to start a business,
but not impossible.
→ e.g Fast-food Restuarants.

⊛ Competition:

→ Perfect Competition occurs in
situation in which any given
product is supplied by large
number of vendor.
→ No restriction on addition of
occur vendors entirery market.
→ Assurance of complete freedom of
both buyer and seller.
e.g Interest providers (Telnet vs Fiber opties)

ⓑ No, monopoly is not for economic
welfare of public.

Q.NO: 2.11:-
        A company has established....?

Sol:

$$D = 780 - 10p$$

$$P = 78 - \frac{1}{10} D$$

$$a = 78, \quad b = 0.1$$

$$D = \frac{78 - 30}{2(0.1)} = \frac{48}{0.2}$$

$\boxed{D = 240}$ per month

Revenue of Max profit $= (78 \times 240) - (6.1 \times (240)^2)$
$$= \$12960$$

$$C_a = C_G + C_v D$$
$$= 800 + (30 \times 240)$$
$$C_a = \$8000$$

Man profit $= T_e - C_T$
$$= \$12960 - \$8000$$

$$\boxed{\text{Man profit} = \$4960} \quad \underline{Ans}$$

QNO: 2.16
     A plant has capacity.. --;?

Sol:

Revenue $= \$328 D$
$G = \$504000 + \$166 D$

for breakpoint
revenue $=$ total cost
$328 D = 166 D + 504000$
$162 D = 504000$
$$\boxed{D = 3111}$$

18% Fixed price Reduction $= 504000 (0.82)$
$$= \$413280$$

6% Variable price Reduction $= 166 (0.94)$
$$= \$156.04$$

Now
$$CT = \$156.04 + \$413\,280$$
breakpoint will be
$$\$398\,D = \$156.04\,D + \$413\,280$$

$$\boxed{D = 2403}$$

percentage reduction will be

$$\left(\frac{3111 - 2403}{3111}\right) \times 100 = 22.78\,\%$$

Au

QNO: 2.18

The annual fixed cost ----?

Sol:
$$TR = pD$$

$$D = \frac{TR}{p}$$

$$D = \frac{280,000}{70}^{7000}$$

$$D = 7000 \text{ units}$$

$$Cv = CuD$$

$$Cu = \frac{Cv}{D} = \frac{14000}{7000}^{20}$$

$$\boxed{CV = 20}$$

$$TR = CT$$

$$PD = C_F + C_VD$$
$$D = \frac{C_F}{P-C_V}$$

$$D = \frac{100,000}{40-20} = \frac{100000}{20}$$

$$\boxed{D = 5000 \text{ units}}$$

Q NO: 2.20

The fixed cost related to the product ——— ?

Sol:

For breakpoint
$$TR = C_T$$
$$PD = C_F + C_VD$$
$$(30,000 - 20,000) D = 600,000$$

$$D = \frac{500,000}{10,000}$$

$$\boxed{D = 50}$$

(b) Mattenical compression is

$$\boxed{P = \frac{TR}{D}}$$ Ans

QNO: 2.33

A farmer estimulates that....?

Sol.

$$P = \$ 3 \text{ per bushed}$$

$$TR = PD = 3 \times 1000 = \$ 3000$$

if we delay one week

$$TR = 1.5 (2000) = \$ 3000$$

if we delay two week

$$TR = 0.7 (3000) = \$ 2250$$

if we delay three week

$$TR = 0.375 (4000) = \$ 1500$$

(b)

if fermer harvest in first week then he will be able to get high revenue and it will also have low risk.

<u>Ans</u>

QNO: 2.31

A manufacturing — — — ?

Sol $\quad C_T = \$100000 + \$20000$

$\quad W = \$15 + \$10$

$\quad P = \$40$

As we know that breakpoint is $TR = CT$

$$PD = CF + CvD$$
$$40D = 120000 + 25D$$
$$15D = 120000$$
$$\boxed{D = 8000} \rightarrow \text{option 3}$$

(b)

We know that

$$\boxed{\text{profit / less} = \$30000}$$

$\quad \hookrightarrow$ option 5

(c)

$$\text{Profit} = TR - CT$$
$$\text{profit} = PD - CF - CvD$$

$$6000 = 35D - 120000 - 25D$$

$$\boxed{D = 18000}$$
$$\downarrow$$
$$\text{option 4}$$

Q.NO: 2.14

A company Production ---- ?

Sol

$$D = 500 - 5p$$

$$C_F = \$ 1000 / month$$
$$C_v = \$ 20 \quad units$$

As given
$$D = 500 - 5p$$
$$P = 100 - 0.2D$$

$$a = 100 \quad, \quad b = 0.2$$

$$D_{TRmax} = \frac{a}{2b} \quad and \quad D_{maxp} = \frac{a-w}{2b}$$

$$D_{TRmax} = \frac{100}{2(0.2)} = 260 \quad \rightarrow \text{①}$$

$$D_{maxp} = \frac{100 - 20}{2 \times 0.2} = 200 \quad \rightarrow \text{②}$$

(a) $$TR = aD_p - bD_p^2$$

$$= 100 \, (250) - (0.2 \times (250)^2)$$
$$= 25000 - 12500$$
$$\boxed{TR_{max} = \$ 12500}$$

(b)

$$T_R = a D_p - b D_p^2$$
$$= (100 \times 200) - (0.2 \times (200)^2)$$
$$= 20000 - 8000$$

$$T_R = \$12000$$

$$C_T = C_F + C_V D$$
$$= \$1000 + (20 \times 200)$$
$$= \$1000 + \$4000$$

$$\boxed{C_T = \$5000}$$

Man Profit $= T_R - C_T$
$$= \$12000 - \$5000$$

$$\boxed{Max. \; T \, profit = \$7000}$$

Ans