IQRA National University, Peshawar
Department of Electrical Engineering
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Power Generation
Assignment 1

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(CLO -1) **20**

:VA distribution transformer costs Rs 2,00,000 and has an estimated useful life of rs. Find the annual depreciation amount, assuming that the scrap value of the rmer to be Rs 10,000.

erage demand of a consumer is 40 A at 230 volts at unity power factor His total consumption annually is 10,000 KWh. If the unit rate is Rs 2 per kWh for the first rs use of the demand per annum plus Re 1 for each additional units, Calculate the bill of the consumer and equivalent flat rate.

Date: ______

Question 1 (a):-

Given that

$P = 200,000$

$S = 10,000$

$N = 20$ years

Depreciation $D = ?$

$D = (P-S)/n$

$$D = \frac{200,000 - 10,000}{20}$$

$D = 9500$ annually

(b) Solution

energy $E = 10,000$ KWb

Current $I = 40A$

$V = 230V$

Consumer demand $P = V I \cos\theta = 230 \times 40 \times 1$

$P = 9200W$

$P = 9.2 KW$

Consumption for 500 hours $= 500 \times 9.2 = 4600 KWh$

Since the cost of electricity is Rs 2 P/KWh for first 500 hours So

$5400 \times 1 =$ Rs 5400

Annual $= 9200 + 5400$

$= 14600$ Bill

Flat rate equivalent $= 14600/10,000$

$= 1.46$ per KWh

Date:

(2)

Question 2 :-

Sol:- Energy generated during 24 Hours

$= (500 \times 5) + (750 \times 1) + (1000 \times 1) + (2000 \times 2) + (2500 \times 3) + (1500 \times 1) + (2500 \times 4) + (2000 \times 2) + (2500 \times 2) + (1000 \times 2) + (500 \times 1)$

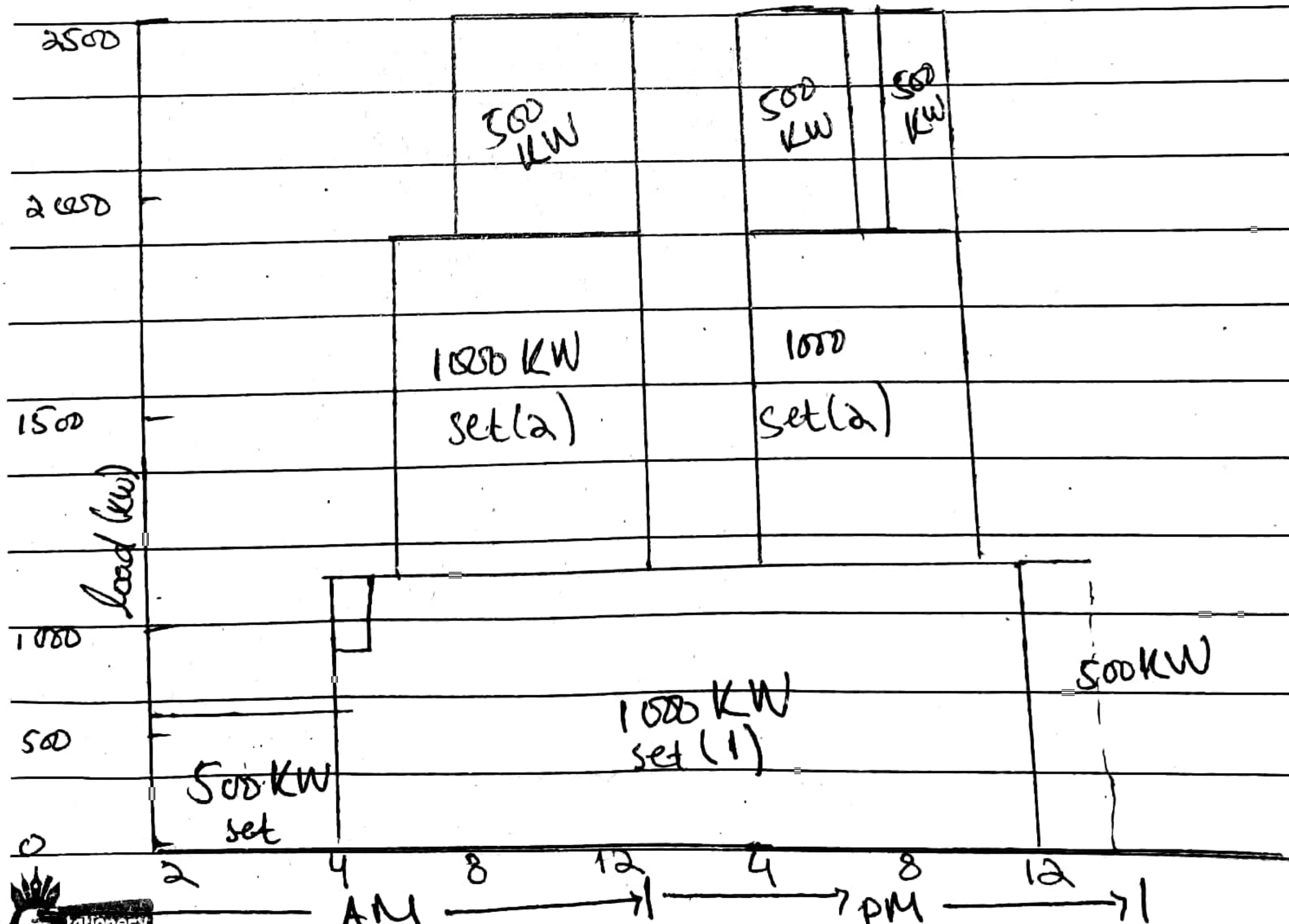
$= 38,750$ KW

Max demand = 2500 KW

Load factor = $\frac{\text{Energy generated during 24 Hours}}{\text{Max demand} \times 24 \text{ Hours}}$

$= \frac{38,750}{2500 \times 24}$

$= 64.7\%$



Date:___________ (3)

Factor of Plant Capacity = $\frac{\text{Energy produced during 24 hours}}{\text{Installed capacity (KW)} \times 24 \text{ hours}}$

Two Sets = 1000 KW

ONE Set = 500 KW

So we have to keep 1000 KW as a Reserve Source.

Total Installed Capacity = 1000 + 1000 + 500 + 1000 (reserve)
= 3500 KW

Plant's Capacity Factor = 38,750/3500×24
= 0.46 or 46%

Fixed Schedule as above the energy that could have been generated by the plant's capacity running for Schedule time would be
(500×6) + (1000×2) + (2000×2) + (2500×3) + (1500×1) + (2500×4) + (2000×2) + (2500×2) + (1000×2)
= 39000 KWh

Energy produced = 38,750 KWh

Plant's Factor = $\frac{\text{Energy produced (KWh)}}{\text{capacity of plant (KW)} \times \text{Total hours plant is operated}}$

$= \frac{38750}{39,000}$

= 0.994

= 99.4%