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Dept :- BE(E)
Subject :- Power Generation
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x ~*~ x

Q.1 :-
a)-
Ans:- Given data:-

$P = 200,000$
$S = 10,000$
n or $N = 20$ years

Required :-

Depreciation $= D = ?$

Solution :-

$D = (P-S)/n$

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

$D = 9500$ anually at the given data.

x ~*~ x

Q1 :-
b)-
Ans:- Given :-

Energy $= E = 10,000$ kwb
Current $= I = 40A$.
Voltage $= V = 230V$.

Required:-

Annual bill $= ?$
equivalent flat rate $= ?$

Solution :-

As we know by formula;

So:-

$P = VI\cos\theta = 230 \times 40 \times 1$.

$P = 9200W$

or

$(P = 9.2 KW)$

So:-

Electricity consumption for the first 500 hours is =

$= 500 \times 9.2$

$= 4600 KWh$

As the cost of electricity is Rs. 2 / KWh, of the first 500 hours,

Therefore the consumer has to pay :

$5400 \times 1 =$ Rs. 5400

Annual bill = 9200 + 5400

= 14,600.

The flate rate equivalent =

= 14600/10,000 = (1.46 per KWh)

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Q.2:-

A)

Ans:-

Solution :-

Energy generated during 24 hrs.

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

= 38,750 KW

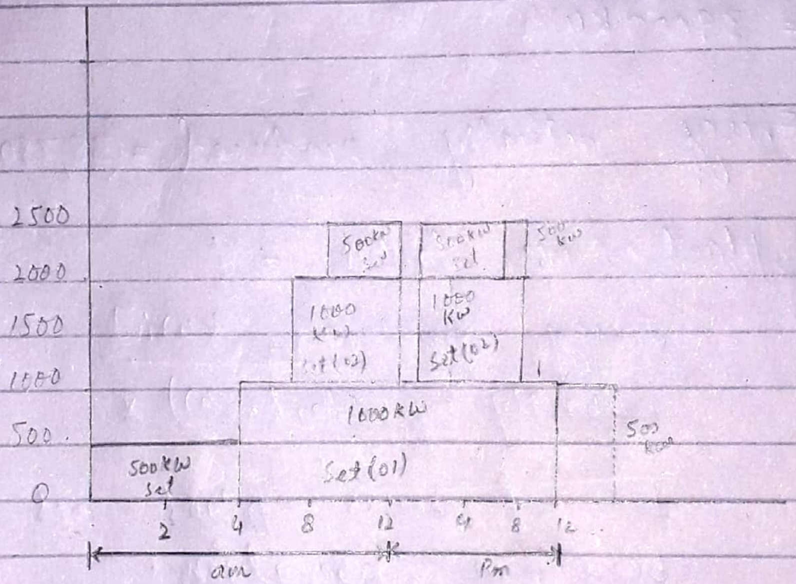
Maximum demand = 2500 KW

load factor

$= \frac{\text{Energy generated during 24hrs}}{\text{Maximum demand} \times 24\text{hrs}}$

$= 38,750 / 2500 \times 24$

$= 64.7\%$



Plant capacity factor:-

$= \frac{\text{Energy produced during 24hrs(kWh)}}{\text{Installed capacity (KW)} \times 24\text{ hrs}}$

Two sets each of 1000 KW, one set of 500 KW.

In this case a set of 1000 KW will have to be brought and kept as reverse.

The total installed capacity is:

= 1000 + 1000 + 500 + 1000 (reverse)

= 3500 KW

plant capacity factor =

$= 38,750 / 3500 \times 24 = (0.46 \text{ or } 46\%)$

with the operating sheduled fixed as above the energy that could have been generated by the capacity of plant actually running for the scheduled time would be

$(500 \times 6) + (1000 \times 2) + (2000 \times 2) + (2500 \times 3) + (1500 \times 1) + (2500 \times 4) + (2000 \times 2) + (2500 \times 2) + (1000 \times 2)$

$= 39000$ kWh

Energy actually produced $= (38,750$ kWh$)$

plant use factor =

$$= \frac{\text{Energy produced (kWh)}}{\text{capacity of plant (kW)} \times}$$

No. of hours plant has been in operation.

$= 38750 / 39,000$

$= (0.994$ or $99.4\%)$

The End

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