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QNO1:- What is meant by electricity tariff, explain different classes of tariff with examples?

Answer

Tariff for Electricity:-

The electricity generated is to be supplied to the consumers, the total cost of generation and profit as to be recovered from the consumers. The rate of energy sold to the consumers depend on type of consumers as domestic commercial and industrial.

Classes Of Tariff:-

(1) **Plain Tarriff:-**

In plain tariff it is the cost of electricity units in terms of KWh (1 unit = 1 KWh) actually used by a consumers are charged in the bill and therefore only consists of variable component

The units in term of kwh are registered by the energy meter installed at consumer premises.

eg- (1 unit = 1 kwh).

(2) **Two part Tariff:-**

Cost of electricity supplied to consumers may be divided into fixed cost and running cost.

Two part tariff consist of fixed and running cost for large power consumer two part tariff is imposed.

Two part tariff usually have KVA or KW and variable portion based on the amount of electricity units consumed

eg → Tariff = Rs per KVA(KW)
+ Rs per kwh.

(3) **Three Part Tariff:-**

Three part tariff consists of Fixed part based on KVA or KW, variable portion based on KWH and maximum demand which varies depending on habit of use of appliances. maximum demand ~~indicator~~ can be obtain from maximum demand indicator installed on distribution transformer.

Eg → Tariff = (Rs per KVA(KW) + Rs per KWH + Rs per KW max demand)

(QNO2 (Answer))

The maximum demand is 2500 KW.

Energy generated during 24 hours is

= (500×5) + (750×1) + (1000×1) + (2000×2) + (2500×3) + (1500×1) + (2500×4) + (2000×2) + (1000×2) + (500×1) = 38,750 KWH.

maximum demand = 2500 kw

Now we know that :-

Load Factor = $\frac{\text{Energy generated during 24 hours}}{\text{Maximum demand} \times 24 \text{ hours}}$

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

Load Fact = 64.7 %

Now Two sets each of 1000 kw One set of 500 kw capacity are following generator.

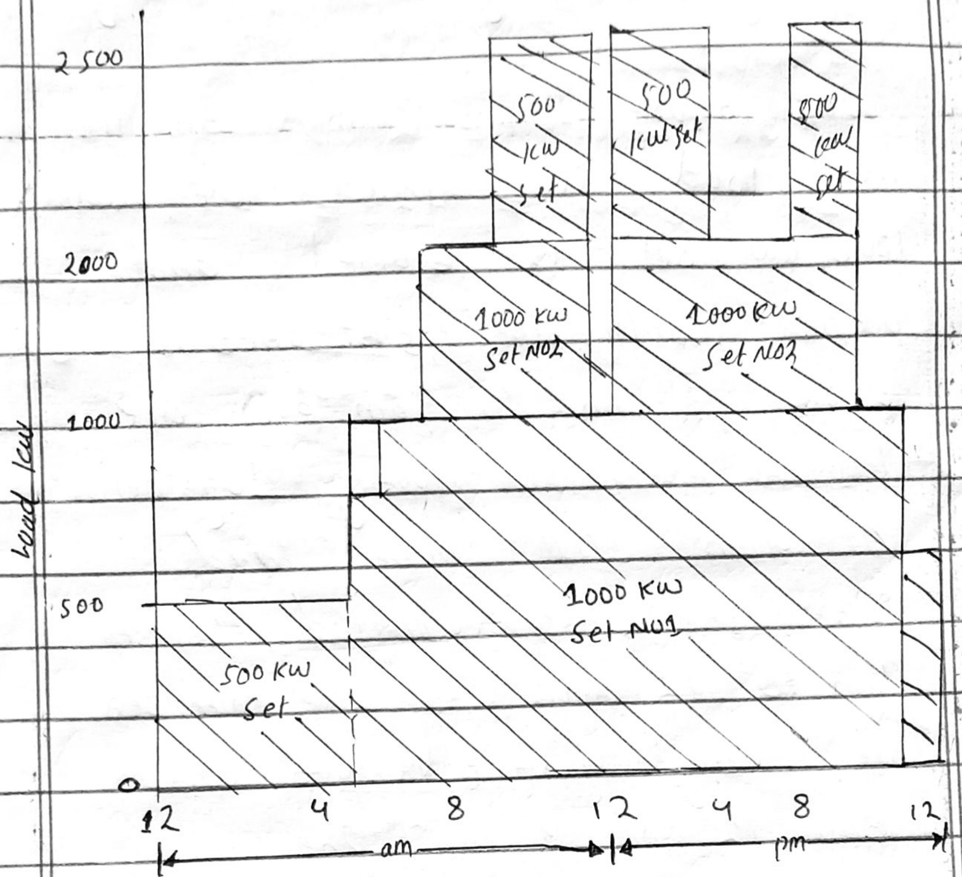
The reserved capacity required will correspond to the largest size of the unit in the station in this case, a set of 1000 kw will have to be bought and kept as reserve.

$1000 + 500 + 1000 (\text{Reserve}) = 3500 \text{ kw}$

plant capicity factor = $\frac{\text{Energy produced in 24 H (kwh)}}{\text{Installed capacity kw} \times 24}$

$= \frac{38,750}{3500 \times 24} \Rightarrow 0.46 \text{ or } 46\%$

Plant capicity factor = 46%



Load Curve of a power station.

with this type of load curve the sizes of units selected as above, The operating schedule can be ~~show in~~ arranged as follows.

From 11 pm to 5 am only 500 kw Set is run.
At 5 am the load is increased.
This one set 1000 kw is run from

5am to 7am taking up the necessary load.

Just before 7 am when an increase in load is expected, the second 1000 kw set is started and parallel with the first one.

From 7 am to 9am both are 1000 kw sets are running together.

At 9am still more load.

The 500 k set started. between 9am to 12 noon all the three sets are running on full load.

B/w 12 and 1 pm the load decreased

After 11 pm only the 500kw set need to be run.

At each time of change over, care should be taken to ensure paralleling and load transfer.

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

(7)

$(500 \times 6) + (1000 \times 2) + (2000 \times 2) + (2500 \times 3) + (1500 \times 1) + (2500 \times 4) + (2000 \times 2) + (6500 \times 2) + (1000 \times 2) = 39000$ kwh.

Energ actually produced = 38,750 kwh

Plant use factor = $\frac{\text{Energy produced (kwh)}}{\text{capacity of plant (kw)} \times \text{Number of hours}}$

$= \frac{38,750}{39000} = 0.994$ or 99.4%.

Plant use factor = 99.4% Ans.

Q3 Solution:

Industrial:

Max demand = 2400

Load factor = $\frac{1420}{2400}$ = 0.59 or 59%

Diversity factor = $\frac{210}{2400}$ = 0.08 or 8%

Class contribution fact = $\frac{100}{2400}$ = 0.04 or 4%

For Residential,

Max demand - 2400

Load Fact = $\frac{1470}{2400}$ = 61.1%

Divercity = 255/2400 = 0.10 or 10.6%

class Cont. Fact = $\frac{100}{2400}$ = 0.04 or 4.1%

Commertial:.

Max Demand - 3600

L.F = $\frac{2255}{3600}$ = 0.62 or 62.6%

D.F = $\frac{275}{3600}$ = 0.076 or 7.63%

CCF = $\frac{150}{3600}$ = 0.04 or 4.16%

Ans.