Q. No-01 Details of a Generating Station are

Given :- Connected Load = 43 MW = 43000 KW

Max. Electric Load / Maximum demand = 20 MW = 20000 KW

Per Year Generated Units = 615×10^6 (KWh) then

find :- Electric Load Factor and Electric demand factor?

Sol^n :- Average Load = $\frac{\text{Generated units per Year (KWh)}}{\text{hours in a Year } (365 \times 24) \text{ (hr.)}}$

So,

(a) Avg. Load = $\frac{615 \times 10^6}{365 \times 24} = \frac{615 \times 10^6}{8760}$

We Know,

Load Factor = $\frac{\text{Avg Load}}{\text{Max. Load}} = \frac{615 \times 10^6}{8760 \times 20000}$

Load factor = 0.35

(b) Demand Factor = $\frac{\text{Max. Demand}}{\text{Connected Load}}$

$= \frac{20000}{43000} = 0.465$

Q= 25 MW के Electric Generating Station पर peak Load / Max. Load 20 MW है इस Station 4 types of Electric Loads को Supply provide करता है जिनकी व्यक्तिगत Max. demands क्रमशः 12 MW, 9MW, 6MW, 3 MW है, Yearly Load factor - 0.5 है then find -

a- Yearly average Load

b- Yearly Generated Electrical Energy

c- Yearly diversity factor

d- Yearly demand factor

e- Plant Capacity Factor and Utility Factor

Sol:- Given Us - Plant Capacity = 25 MW = 25000 KW

Max. Load = 20 MW = 20000 KW

Individual Max. demand = 12 MW, 9MW, 6MW, 3MW

Load factor = 0.5

We Know - Avg Load = Load Factor × Max. Load

a- Avg. Load = $0.5 \times 20 = 10\ MW$

b- avg Load = $\frac{\text{Generated Units}}{\text{hr. } (365 \times 24)} =$

Generated Units = Avg Load × 365 × 24

$= 0.5 \times 20 \times 365 \times 24 \Rightarrow$ MW

$= 10 \times 10^3 \times 365 \times 24 =$ KWH

$$\text{Units} = 8760 \times 10^5 \text{ kwh}$$

c- Diversity Factor = $\frac{\text{Sum of personal max. Demand}}{\text{max. Demand}}$

$= \frac{12+9+6+3}{20} = \frac{30}{20} = \underline{\underline{1.5}}$

d- Demand Factor = $\frac{\text{max. Demand}}{\text{Connected Load}}$

D.f. $= \frac{20}{12+9+6+3} = \frac{20}{30} = \underline{\underline{0.67}}$

e- Capacity Factor = $\frac{\text{Avg Load}}{\text{capacity}}$

C.f. $= \frac{10}{25} = \underline{\underline{.4}}$

Plant Utility Factor = $\frac{\text{max. Demand}}{\text{Capacity}}$

$= \frac{20}{25} = \underline{\underline{.8}}$