1. A distribution transformer costing Rs 50,000 has a useful life of 15 years. Determine the annual depreciation charge using straight line method. Assume the salvage value of the equipment to be Rs 5,000. **[Rs 3,000]**

2. The power generation equipment of a power station cost Rs 15,75,000 and has a useful life of 25 years. If the salvage value of the equipment is Rs 75,000 and annual interest rate is 5%, determine annual amount to be saved by sinking fund method. **[Rs 31,400]**

3. A 500 kVA distribution transformer costs Rs 50,000 and has a useful life of 20 years. If the salvage value is Rs 5,000 and annual compound interest rate is 8%, determine the value of the transformer at the end of 10 years using sinking fund method. **[Rs 35,700]**

4. A generating station has a maximum demand of 10 MW. Calculate the cost per unit generated from the following data:
Annual load factor = 35%
Capital cost = Rs 12,50,000
Annual cost of fuel and oil = Rs 8,00,000
Taxes, wages and salaries = Rs 7,00,000
Interest and depreciation = 10%

5. From the following data, estimate the cost per kWh for the generating station:
Plant capacity = 50 MW
Annual load factor = 40%
Capital cost = Rs 12 × 106
Annual cost of wages, taxes etc = Rs 4,00,000 ;
Cost of fuel, lubrication, maintenance = Rs 17,52,000 ;
Annual interest and depreciation = 10% of initial value.
[1·913 paise per kWh]

6. In a particular area both steam and hydro stations are equally possible. It has been estimated that capital costs and running costs of these two types will be as under:

Plant	Capital cost_kW	Running cost_kWh	Interest
Hydro	Rs 3000	3 paise	5%
Steam	Rs 2000	10 paise	5%

If the expected average load factor is 40%, which is economical to operate, steam or hydro? **[Hydro]**

7. The energy cost of a 100 MW steam station working at 40% load factor comes out to be 12 paise/kWh of energy generated. What will be the cost of energy generated if the load factor is improved to 60%? The fuel cost of the power station due to increased generation increase the annual generation cost by 5%. **[8·4 paise]**

8. A load having a peak value of 50 MW and 45% load factor is to be supplied by a steam power station in conjunction with a hydro-power station, the latter supplying 60 million units of energy per annum with a maximum output of 20 MW.

(*i*) Capital cost	Steam: Rs 2000 per kW installed Hydro: Rs 3000 per kW installed
(*ii*) Cost of fuel	Coal Rs 150 per metric ton ; consumption being 0·5 kg per unit generated
(*iii*) Maintenance charges	Steam: 0·7 paise per unit Hydro: 0·5 paise per unit
(*iv*) Interest and depreciation	Steam: 10% per annum Hydro: 9% per annum

Calculate the average cost of energy. **[11·6 paise]**