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**Third Semester B.E. Degree Examination, May/June 2010**  
**Electric Power Generation**

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, selecting  
at least TWO questions from each part.**

**PART – A**

- 1 a. With a neat block diagram, explain the working of a geo-thermal power plant. (08 Marks)
- b. Explain with sketches, the working of single-basin and double basin tidal-power plant. (06 Marks)
- c. Discuss the benefits of 'co-generation'. (06 Marks)
- 2 a. Explain the principle of working of a gas-turbine plant. Also explain open cycle and closed cycle gas-turbines. (10 Marks)
- b. Explain with a block diagram, working of a bio-generation plant. (05 Marks)
- c. What is 'distributed generation'? Explain. (05 Marks)
- 3 a. Mention the factors to be considered for the selection of site for a hydro-electric power plant. (06 Marks)
- b. Discuss the functions of the following in a thermal plant:  
i) Condensor ; ii) Cooling towers ; iii) Economizer (08 Marks)
- c. Explain with a line-diagram, fuel handling system of a thermal power plant. (06 Marks)
- 4 a. State the main components of a nuclear power station. Describe the function of each. (10 Marks)
- b. Explain the necessity of providing shield in a nuclear power-plant. (05 Marks)
- c. Explain the operation of a fast-breeder reactor. (05 Marks)

**PART – B**

- 5 a. What are load curves? What information do you derive from them? What are energy load curves? (08 Marks)
- b. A generating station supplies the following loads: 15000 kW, 12000 kW, 8500 kW, 6000 kW and 450 kW. The station has a max demand of 22,000 kW. Calculate :  
i) Demand factor  
ii) Diversity factor  
iii) No. of units supplied annually, if the load factor is 48%. (12 Marks)
- 6 a. What is tariff? Explain : i) Max demand tariff ; ii) p.f. tariff. (08 Marks)
- b. A generating station has a max demand of 50 MW. Calculate the cost / kwh delivered from the following data:  
i) Capital cost = Rs.95 x 10<sup>5</sup>  
ii) Annual cost of fuel + oil = Rs.9 x 10<sup>5</sup>  
iii) Taxes, wages and salaries = Rs.6 x 10<sup>5</sup>.  
Rate of interest and depreciation is 10%. Annual load factor is 50%. (08 Marks)
- c. With the help of a neat sketch, explain "single bus-bar with sectionalizing". (04 Marks)

- 7 a. Discuss the locations of reactors in power systems. (04 Marks)
- b. A consumer is taking a load of 20 kW at a p.f. of 0.8 (lag). Find the rating of the capacitor to raise the p.f. to 0.95 (lag). (04 Marks)
- c. An inter connected generator reactor system is shown below in Fig.7(c). The base values for the given % reactance are the rating of individual pieces of equipment. Determine the fault currents and KVA (fault) for a short circuit fault at F. Assume base MVA as 20 MVA and bus – bar voltage as 11 kV (L-L). (12 Marks)

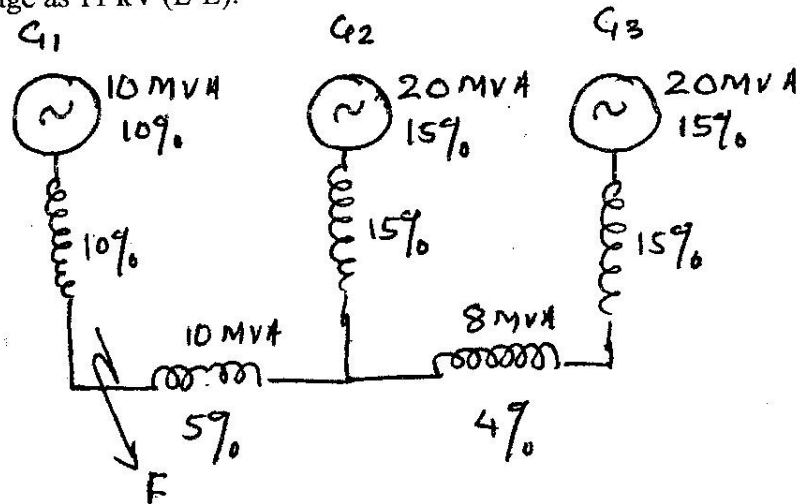


Fig.7(c).

- 8 a. Determine the value of inductance of arc suppression coil to neutralize the charging current of overhead line having line to ground capacitance of  $0.4 \mu\text{F}$ . If the supply frequency is 100 Hz and the operating voltage is 132 kV, find the KVA rating of the coil. (06 Marks)
- b. Discuss the advantages of grounding. (04 Marks)
- c. How are sub-stations classified? (04 Marks)
- d. Write briefly on:
- Resonant grounding
  - Earthing transformer. (06 Marks)

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