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Third Semester B.E. Degree Examination, December 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 schematic diagram, explain the essential elements of hydro electric power plant. (08 Marks)
- b. With a neat sketch, explain the working of geothermal power plant. (06 Marks)
- c. Explain the working of wind energy conversion system, with a block diagram. (06 Marks)
- 2 a. Describe the schematic arrangement of a thermal power station. Briefly explain the functions of each. (10 Marks)
- b. Mention the application of diesel – electric power plants. (05 Marks)
- c. Mention the advantages and disadvantages of nuclear power plant. (05 Marks)
- 3 a. What are the nuclear fuels? Classify the nuclear reactors. (06 Marks)
- b. Explain the functions of the following in a nuclear reactor :
i) Control rod ; ii) Moderator
iii) Reflector ; iv) Biological shield. (10 Marks)
- c. Discuss some of the safety measures incorporated in a nuclear power plant. (04 Marks)
- 4 a. With a schematic diagram, explain the working of a solar power plant. What is the importance of this plant in the present energy crises in the world? (10 Marks)
- b. Explain the working of a gas turbine power plant, with a schematic diagram. (05 Marks)
- c. With a neat diagram, briefly explain the pressurized water reactor (PWR). (05 Marks)

PART – B

- 5 a. Explain the following terms as applied to power system :
i) Diversity factor
ii) Plant capacity factor
iii) Load factor
iv) Average load. (08 Marks)
- b. The daily demands of three consumers are given below :

Time	Consumer 1	Consumer 2	Consumer 3
12 mid night to 8 A.M.	→ No load	200 W	No load
8 A.M. to 2 P.M.	→ 600 W	No load	200 W
2 P.M. to 4 P.M.	→ 200 W	1000 W	1200 W
4 P.M. to 10 P.M.	→ 800 W	No load	No load
10 P.M. to Mid night	→ No load	200 W	200 W

Plot the load curve and find :

- i) Maximum demand of individual consumer
- ii) Load factor of individual consumer
- iii) Diversity factor
- iv) Load factor of the station.

(12 Marks)

- 6 a. Discuss the disadvantages of having low power factor and discuss the various methods for power factor improvement. (10 Marks)
- b. Describe the desirable characteristics of a tariff. (04 Marks)
- c. Explain : i) Two part tariff ; ii) Power factor tariff ; iii) Maximum demand tariff. (06 Marks)
- 7 a. Explain the steps for calculating the symmetrical 3 phase short circuit currents. (05 Marks)
- b. Fig.Q.7(b) shows the single line diagram of a 3 phase system. The percentage reactance of each alternator is based on its own capacity. Find the short circuit current that will flow in to a complete 3 phase short circuit at F. (10 Marks)

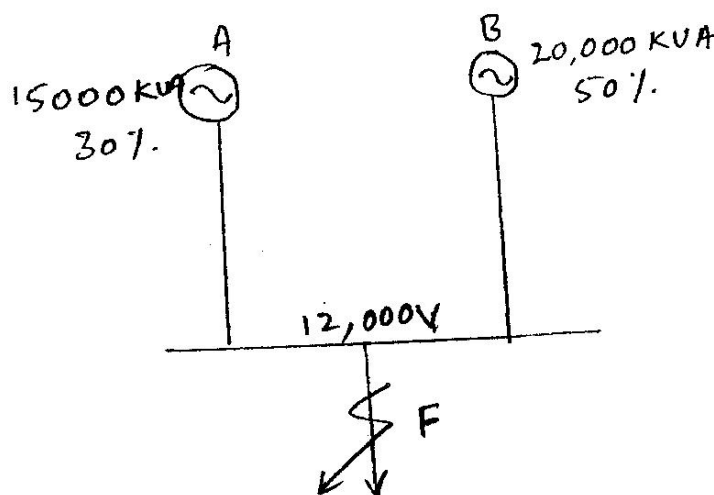


Fig.Q.7(b).

- c. With a neat sketch, explain the resistance grounding. (05 Marks)
- 8 a. Define a substation and mention different types of substations. (06 Marks)
- b. Explain the various methods of connecting short circuit current limiting reactors in the power system. (10 Marks)
- c. Discuss the advantages of grounding. (04 Marks)
