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)**
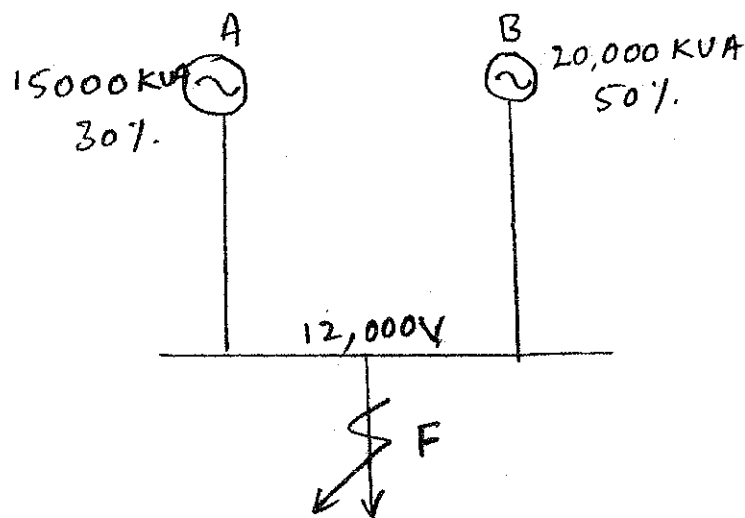

Fig.Q.7(b).

    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)**

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