Code No: 54008 **R09**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year II Semester Examinations, May - 2019
POWER SYSTEMS-I
(Electrical and Electronics Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks
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1.a) What are the systems used for firing the boilers? Explain with sketches. Also mention the advantages and disadvantages of pulverizing the fuel used in boilers?
b) Write notes on auxiliaries of boilers. [9+6]

2.a) Explain with neat diagram the function of BWR. Mention the advantages and disadvantages.
b) Explain the principle of operation of Gas Power Stations and its various components. [8+7]

3.a) Discuss about DC feeders fed from one end and both ends, with equal and unequal voltages. Give their voltage characteristic.
b) A DC ring main system ABCDA fed from point A with 110 V supply and the loop resistances of various sections are AB = 0.1ohms; BC = 0.2 ohms; CD = 0.2 ohms and DA = 0.1ohms. The system supplies 60A at B, 40A at C and 70A at D. Calculate the voltages at each load point. If the points A and C are inter connected through a link of 0.06 ohms. Determine the voltages at the load points. [7+8]

4.a) Explain the following with neat diagrams:
i) AC 3 phase 3 wire distribution system
ii) AC 3 phase 4 wire system.
b) A 400m long single phase AC distributor has a total impedance of (0.02+j0.04) ohms and is fed from one end at 230V. It is loaded as follows: 50A at UPF, 200 m from feeding point; 80A at 0.8 p.f lag, 300 m from feeding point; 50A at 0.8 p.f lag at the far end. Calculate the total voltage drop and voltage at the far end. [8+7]

5.a) Explain the advantages of outdoor sub-station as compared to the indoor substation.
b) Explain in detail the different types of gas insulated substations and give their constructional aspects. [7+8]

6.a) Briefly discuss about the causes of low power factor and explain the concepts of phase advancing and generation of reactive KVAR using static Capacitors for power factor improvement.
b) Deduce the condition for most economical power factor for constant KW load and constant KVA type loads. [8+7]

7.a) Explain the terms load factor and diversity factor. How do these factors influence the cost of generation?

b) A 1000 MW power station delivers 1000 MW for 3 hours, 600 MW for 10 hours, 200 MW for 5 hours and is shut down for the rest of each day. It is also shut down for maintenance for 70 days annually. Calculate its annual load factor. [7+8]

8.a) Briefly discuss about the costs of Generation and their division into Fixed, Semi-fixed and Running Costs.

b) Mention the desirable characteristics of a Tariff Methods and explain with the help of suitable examples the Two-part and Three-part tariff methods. [7+8]

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