Code No: **19EET403** **R19**

II B. TECH II SEMESTER REGULAR EXAMINATIONS, AUGUST 2021
POWER SYSTEMS -I
(ELECTRICAL & ELECTRONICS ENGINEERING)

Time: 3 hours Max. Marks: 60

Note: Answer **ONE** question from each Unit (**5 × 12 = 60 Marks**)

UNIT - I

1. a) Discuss about feed water system and list the operational troubles caused due to impurities in it [6M]
   b) Explain the general arrangement and operation of Hydroelectric power plant. [6M]

(OR)

2. a) Explain the functions of Economizer and Super heater in a thermal power plant? [6M]
   b) Distinguish in detail between Reaction and Impulse turbines. [6M]

UNIT – II

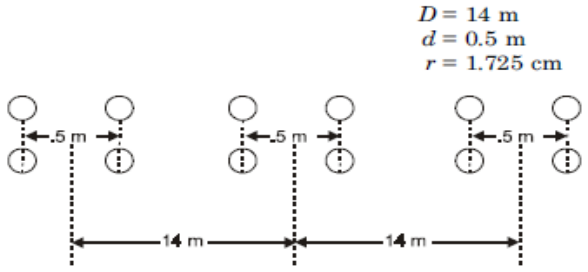
3. a) Explain the working of a Pressurized Water Reactor with a neat diagram and also list its advantages [6M]
   b) List the advantages of gas turbine plants over steam plants [6M]

(OR)

4. a) With a neat labeled diagram, explain the basic components of a nuclear reactor. [6M]
   b) Draw the equivalent circuit of a PV cell and explain its operation. [6M]

UNIT – III

5. a) Explain the significance of Transposition of a three phase-transmission line. [4M]
   b) A single circuit three phase transmission line is composed of four ACSR conductor per phase with horizontal configuration as shown below. Find the inductance per KM length of the transmission line. Radius of each conductor in the bundle is 1.725 cm. [8M]



(OR)

6. a) Explain in detail about the Skin and Proximity effect [4M]
   b) Given a three phase, three wire, 50 Hz system, calculate capacitance per phase when conductors are placed on a horizontal plane with distances of $D_{12} = D_{23} = 10m$, $D_{13} = 15m$. Given conductors are transposed and having a radius of 1.5cm. [8M]

UNIT –IV

7. a) List the features of substation? Briefly mention the different equipment and the layout. [8M]

   b) Explain the factors to be considered for selection of site of a Substation. [4M]

(OR)

8. a) List the factors that affect the choice of primary feeders? [4M]

   b) Why is voltage drop consideration important in distribution systems? How is it computed for a distributor feeding from one end. [8M]

UNIT –V

9. a) Explain the following terms: [8M]
   i) Maximum Demand ii) Connected Load
   iii) Diversity factor iv) Utilization factor

   b) Calculate the annual load factor and average demand, given that peak load is 3.5 MW and energy supplied is 10^7 KWH. [4M]

(OR)

10. a) Explain the following Power factor tariffs: [6M]
   i) KVA maximum demand tariff ii) Sliding Scale tariff
   iii) KW and KVAr tariff

   b) Calculate the cost of generation per KWH from the following data: [6M]
   Capacity of the Plant = 150 MW; Capital cost = Rs. 5000 per KW installed; Interest and depreciation = 12% on capital; Fuel consumption = 2 kg/KWH; Fuel cost = Rs.5000 per tonne; Salaries, wages, repairs and maintenance = Rs2500000 per year; The maximum demand = 120 MW; load factor = 45%

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