Regulation R17 *Subject code: 1P4BB*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A' Grade)

B.Tech II Year II Semester Supplementary Examinations, July 2022

POWER SYSTEM -I

(ELECTRICAL AND ELECTRONICS ENGINEERING)

Maximum Marks: 70 Date:22.07.2022 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks **(10x2M=20 Marks)**

1 Explain the types of fuels used in thermal power plants?
2 What are the classifications of the nuclear reactors?
3 What are the characteristics of a water turbine?
4 What is impulse turbine?
5 Compare AC and DC Distribution system briefly.
6 Draw the single line diagram of radial primary feeder.
7 What is sub-station and what is the need of sub-station in power systems?
8 Explain the maintenance of gas insulated substation?
9 Define the terms:
i) diversity factor ii) Plant capacity
10 What are the methods to improve the power factor?

Part-B

Answer All the following questions. **(10M X 5=50Marks)**

11 a) What is feed water? What are the problems faced due to impurities in fuel water? How are they Eliminated? 5

b) Discuss and compare the performance of different types of boilers used in thermal power plants. 5

OR

12 a) Define nuclear fission. Explain the phenomenon of chain reaction in nuclear power plant. 5

b) Explain in detail about gas turbine plant? 5

13 a) Discuss the difference between Kaplan, Francis and Pelton turbines and state the type of power plants they are suitable for. 6

b)Write short notes on: i.Draft-tube ii. Water Hammer. 4

OR

14 Explain the classification of hydro-electric plants according to available head with neat diagrams? 10

15 A 2 wire D.C distributor is 300mlong and is fed at 240V at point A. at point B, 150 m from A, a load of 120A is taken and at C, 100m in the opposite direction, a load of 80A is taken .If the resistance per
100m of single conductor is 0.03Ω, find:
(i) Current in each section of distributor 10
(ii) Voltage at points B and C.

OR

16 A 1-phase distributor has a total resistance of 0.3 ohm at the midpoint (A), a current of 100 A at 0.6
p.f lagging at the far end (B) a current of 100A at 0.8 p.f lagging is tapped. If the voltage at the far
end is 200V:
(a) Find the voltage at the supply end
(b) Its phase angle w.r.t voltage at far end 10
when:
i. The p.f's are w.r.t respective voltages at the load points
ii. The p.f's are w.r.t voltages at the far end.

17 a) Explain various bus-bar schemes in detail.
b) Draw single line diagram of a gas insulated substation indicating different Equipments, 5
Maintenance of gas insulated substation, and also explain the Role of substations in power system. 5

OR

18 Draw the layout of a typical 11KV/400V Indoor substation and explain the equipment's in detail. 10

19 What is Tariff, Explain about different Tariff methods. 10

OR

20 A generating station has a connected load of 43MW and a maximum demand of 20 MW; the units generated being 61.5×10^6 per annum. Calculate
(a) the demand factor and 10
(b) load factor