



R18 Regulation

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

Subject code: 2P5BA

B.Tech V Semester Regular Examinations, February 2021

POWER SYSTEMS-I
(Electrical and Electronics Engineering)

Maximum Marks: 70

Date: 17.02.2021

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 What is the usage of surge tank in hydro power plant?
- 2 Compare nuclear fission and fusion.
- 3 What is fuel cell?
- 4 What is the type of generator used in wind power plant?
- 5 Distinguish between a feeder and a distributor.
- 6 Write the primary distribution voltages in India.
- 7 Define substation.
- 8 Write about insulating materials used in underground cables?
- 9 Differentiate load curve and load duration curve.
- 10 What are the desirable Characteristics of a Tariff?

Part-B

Answer All the following questions.

(10M X 5=50Marks)

- 11 With a neat sketch explain the construction and working principle of Nuclear power plant. State its advantages and disadvantages. (10M)
OR
- 12 Explain the working principle of Kaplan and Francis turbine with neat sketch. (10M)
OR
- 13 Explain about Wind power generation with neat diagram. (10M)
OR
- 14 Explain the components used in solar power generation with a neat diagram. (10M)
- 15 a) Discuss the advantages of DC transmission over AC transmission. (4M)
b) Derive an expression for the power loss in a uniformly loaded distributor fed at both ends with equal voltages. (6M)

OR

- 16 A single phase distributor 2 km long supplies a load of 120A at 0.8 pf lagging at its far end and a load of 80A at 0.9 pf lagging at its mid-point. Both power factors are referred to the voltage at the far end. The resistance and reactance per km (go and return) are 0.05 ohms and 0.1 ohms respectively. If the voltage at the far end is maintained at 230 V, calculate:
 (a) voltage at the sending end (7M)
 (b) phase angle between voltage at the two ends. (3M)
- 17 Derive the expression for dielectric stress in underground cables. (10M)
 OR
- 18 Derive the expression for insulating resistance used in underground cables. (10M)
- 19 A generating station has the following daily load cycle:

Time	12- 5am	5- 9am	9am-6pm	6pm-10pm	10pm-12am
Load(MW)	20	40	80	100	20

 Examine the load curve and load duration curve. Calculate load factor of the plant, maximum demand and energy supplied by the plant in 24 hours. If the plant as installed capacity 125MW find the capacity factor and utilisation factor.(10M)
 OR
- 20 Explain the following:
 (a) two part tariff (3M)
 (b) Block rate tariff (3M)
 (c) power factor tariff (4M)