



R20 Regulation

Subject code: 3P4BE

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech IV Semester Regular/Supplementary Examinations, September 2023

Power Systems-I
(EEE)

Maximum Marks: 70

Date:23.09.2023 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 which carries 10M.
 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 economizer. Write its functions
- 2 List the salient points of fuel cells
- 3 Define load factor. Justify whether load factor affects the cost of generation or not
- 4 What is two part tariff. For which consumers it is applied.
- 5 What is Pin insulator. Write its demerits
- 6 What is bedding. Write its function in cables
- 7 Enumerate the advantages of bundled conductors
- 8 What is the effect of earth on the capacitance of a transmission line
- 9 Write the limitations of radial distribution system
- 10 What is feeder. What is the design criterion of a feeder

Part-B

Answer All the following questions.

(5X10M=50Marks)

- 11 Explain the working of thermal power station with the help of single line diagram. Explain the function of each component of thermal power station. [10]
OR
- 12 A. Explain the working of gas power station. [5]
B. List out the advantages of non-conventional energy sources. [5]
- 13 A. Define maximum demand, connected load, demand factor and diversity factor. [5]
B. Write about base load, peak load plant and load duration curve. [5]
OR
- 14 A. What is tariff? Explain the objectives of tariff. [5]
B. A supply is offered based on fixed charges of Rs 30 per annum plus 3 paise per unit or alternatively at the rate of 6 paise per unit of first 400 units per annum and 5 paise for all the additional units. Find the number of units taken per annum for which the cost under both tariffs becomes the same. [5]
- 15 A. With a help of neat diagram, explain the function of each component in single core cable. [5]

B. Compare overhead lines with under ground cables. [5]

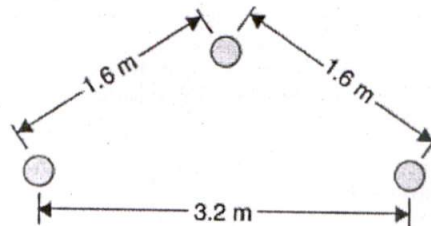
OR

16 A. Discuss the testing of insulators. [5]

B. A single core cable has a conductor radius of 14.5mm and an insulation thickness of 4.6mm. Find the capacitance per meter length of the cable if the dielectric has relative permittivity of 3.2. [5]

17 A. Derive an expression for inductance of a single-phase transmission line. [5]

B. Determine the inductance of a 3-phase line operating at 50Hz and conductors are arranged as shown in figure below. The conductor diameter is 0.8cm. [5]



OR

18 A. Derive an expression for capacitance of a single-phase transmission line. [5]

B. Discuss the methods of reducing corona loss in a transmission system. [5]

19 A. Compare AC and DC distribution systems. [5]

B. Explain the voltage drop calculation in ac distribution when power factors of the loads are referred to receiving end voltage. [5]

OR

20 A. What is distribution system and write about the requirements and design features of distribution systems. [5]

B. A two wire DC distributor, 500m long is fed at one end. The cross-sectional area of each conductor is 3.4cm^2 and resistivity of copper is $1.7\mu\Omega\text{cm}$. The distributor supplies 200A at a distance of 300m from feeding point and 100A at the terminus. Calculate the voltage at feeding end, if the voltage at the terminus is to be 230V. [5]