



Regulation R17

Subject code: 1P6BC

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Year II Semester Supplementary Examinations, Janu 2023
SWITCHGEAR AND PROTECTION

Maximum Marks: 70

17/01/23
(EEE)

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 are the properties of Arc struck in the circuit breaker?
- 2 What is the difference between a circuit breaker and a relay?
- 3 Define the following terms as applied to protective relaying :
(i) Pick-up value(ii) Current setting
- 4 What are the merits of Static relays?
- 5 What type of relays are required for back-up protection of alternator
- 6 What are the advantages of differential protection scheme
- 7 What do you mean by equipment grounding?
- 8 What is the role of non linear resistor in a lightning arrester?
- 9 What are the causes of over voltages
- 10 What is Arc grounding?

Part-B

Answer All the following questions.

(10M X 5=50Marks)

- 11 a) What are the ratings and specifications of a circuit breaker? 5
b) Explain the concept of resistance switching by deriving necessary expressions? 5
- 12 OR
Discuss the principle of operation of an air-blast circuit breaker. What are the advantages and disadvantages of using air as the arc quenching medium? 10
- 13 a) Derive the torque equation of Induction Relay 5
b) With the help of neat sketch explain the principle of operation of Differential relays 5
- 14 OR
a) Explain the operation of a non directional induction relay with neat sketch? 5

- b) Explain the differences between differential relay and a percentage differential relay? 5
- 15 Explain with a neat schematic diagram the working of protection against magnetic inrush current in transformer 10
- OR
- 16 a) A 3-phase transformer of 220/11,000 line volts is connected in star/delta. The protective transformers on 220 V side have a current ratio of 600/5. What should be the CT ratio on 11,000 V side? 5
- b) Describe earth fault protection of sectionalized bus bar 5
- 17 a) What are the merits and demerits of reactance earthing compared to solid earthing 5
- b) Explain the effects of ungrounded neutral on system performance. 5
- OR
- 18 Explain the methods of Neutral Grounding? 10
- 19 What is lightning? List its properties. Discuss the methods of protection against lightning 10
- OR
- 20 a) Explain the construction and working of valve type arrester. 5
- b) State the external and internal causes of over voltage? Explain its ill effect in the power system. 5