



R20 Regulation

Subject code:3P6BB

**TKR COLLEGE OF ENGINEERING AND TECHNOLOGY**

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

**B.Tech VI Semester Supplementary Examinations, December 2024**

**POWER SYSTEM PROTECTION**  
(EEE)

**Maximum Marks: 70**

**Date:30.12.2024**

**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) |                                                           | CO | Bloom Tx |
|-----------------------------------------------------------------|-----------------------------------------------------------|----|----------|
| 1                                                               | Define relay.                                             | 1  | L1       |
| 2                                                               | What is meant by a circuit breaker? Explain its function? | 1  | L1       |
| 3                                                               | Give the various types of over current relay.             | 2  | L1       |
| 4                                                               | What is directional over current relay? Explain.          | 2  | L1       |
| 5                                                               | What is distance relay?                                   | 3  | L1       |
| 6                                                               | What is the Merz-Price voltage protection scheme          | 3  | L1       |
| 7                                                               | What is phasor?                                           | 4  | L1       |
| 8                                                               | What is the purpose of Sampling?                          | 4  | L1       |
| 9                                                               | What is the static over current relay?                    | 5  | L1       |
| 10                                                              | What is RRRV?                                             | 5  | L1       |

**Part-B**

| Answer All the following questions. (5X10M=50Marks) |                                                                                                                                                                                          | CO | Bloom Tx |
|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----------|
| 11                                                  | A) What are the advantages of induction cup relay over induction disc relay? [5M]<br>B) What are the different types of electromagnetic relays? Discuss their field of application. [5M] | 1  | L2       |
| OR                                                  |                                                                                                                                                                                          |    |          |
| 12                                                  | Explain about zones of protection with primary and backup protection. [10M]                                                                                                              | 1  | L2       |
| 13                                                  | A) Explain the operation of a directional over current relay with a neat circuit diagram. [5M]<br>B) Explain in detail about the IDMT relays characteristics. [5M]                       | 2  | L2       |
| OR                                                  |                                                                                                                                                                                          |    |          |
| 14                                                  | A) Explain the merits and demerits of static relays. [5M]<br>B) What are the types of over current relays? Sketch the characteristics and explain. [5M]                                  | 2  | L2       |
| 15                                                  | A) Explain briefly about stator fault protection in generator. [5M]                                                                                                                      | 3  | L2       |

|    |                                                                                                                                                               |   |    |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|
|    | B) How do you protect transformer against incipient faults? [5M]                                                                                              |   |    |
|    | OR                                                                                                                                                            |   |    |
| 16 | A) Explain 3-zone distance protection of a transmission line. [5M]<br>B) Explain with diagram the high impedance bus bar differential protection scheme. [5M] | 3 | L2 |
| 17 | Differentiate between amplitude comparators and phase comparators? [10M]                                                                                      | 4 | L2 |
|    | OR                                                                                                                                                            |   |    |
| 18 | A) What are the advantages of static directional relay? [5M]<br>B) What is static amplitude comparator? [5M]                                                  | 4 | L2 |
| 19 | What are the effects of power swings on distance relays? [10M]                                                                                                | 5 | L2 |
|    | OR                                                                                                                                                            |   |    |
| 20 | Explain in detail about SF6 circuit breaker. [10M]                                                                                                            | 5 | L2 |