R20 Regulation

Subject code:3P6BB

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VI Semester Regular Examinations, June/July 2023

POWER SYSTEM PROTECTION

(Electrical & Electronics Engineering)

Maximum Marks: 70 Date:24.06.2023 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 Potential transformer. Mention its uses

2 If the pickup value of a relay is 8A, the fault current is 30A. Find its PSM?

3 What is MHO relay. Write its applications

4 Draw R-X loci of Impedance relay

5 What are the consequences of loss of excitation in generators

6 What is Buchholz relay? What for it is used?

7 Write the importance of digital relays

8 List the demerits of static relays over electromagnetic relays

9 Write the characteristics of fuse

10 What is current chopping

Part-B

Answer All the following questions. (5X10M=50Marks)

11 A. Explain the need of power system protection. [5]
B. Discuss the principle of operation of thermal relays. [5]

OR

12 A. Explain the operation of induction cup relay. [5]
B. Give the detailed classification of protective relays and schemes. [5]

13 What is MHO relay? Discuss its principle of operation. Show its characteristics on R-X diagram. What is the merit of this relay for transmission line protection? [10]

OR

14 A. Explain about admittance relay and its characteristics. [5]
B. Draw and explain the circuit for the protection of ring main system? [5]

15 A. Discuss in detail about the three-zone protection of transmission lines. [5]
B. Explain the concept of carrier current protection. [5]

OR

16 A. What are the different faults of transformer? Explain. [5]
B. Explain about protection of transformer in detail. [5]

17 A. Explain the operation of static phase comparator used in static relays. [5]
B. Discuss the operation of static differential relay. [5]

OR

18 Draw the block diagram and explain the operation of microprocessor based digital relays? [10]

19 A. Explain the working of an SF6 circuit breaker with the help of diagram? [5]
B. A circuit breaker is rated at 1500A, 2000MVA, 33kV, 3 sec, 3 phase oil circuit breaker. Find the normal rated current, breaking current, making current and shot time current rating? [5]

OR

20 A. Describe the operational phenomena of an air blast Circuit breaker. [5]
B. Explain the concept of resistance switching. Also list out its drawbacks. [5]