

**Duration : 3 Hours**

**Total Marks : 80**

**Instructions:**

1. Question No. 1 is compulsory
2. Attempt **any three** questions out of remaining **five** questions.
3. Assume suitable data, if necessary and justify the same.

**Q1. Answer the following questions.**

**20**

- a) Mention at least five differences between a fuse and a circuit breaker. 5
- b) Explain the properties of SF<sub>6</sub> gas that makes it suitable for arc quenching. 5
- c) Explain time-graded protection of radial feeder. 5
- d) What are the advantages and disadvantages of static relays over electromagnetic relays. 5

- Q2. a) Draw and explain construction and working of Pantograph Isolators. 10  
Q2. b) Explain the working and cut off characteristics of HRC Fuse. 10

- Q3. a) Explain with neat diagram, the construction and working of Vacuum Circuit Breaker. 10  
Q3. b) Explain the construction and working principle of Induction Disc Relay. 10

- Q4. a) Explain the differential protection given to delta-star power transformer . 10  
Q4. b) What are the desirable qualities of protective relays? Explain in detail. 10

- Q5.a) What is the working principle of distance relays? Differentiate between different types of distance relay. 10  
Q5.b) State various abnormal conditions of induction motor. Explain motor protection against single phasing. 10

- Q6. a) Explain the three-step protection provided for transmission line. 10  
Q6. b) Write a short note on Numerical Relay. 10