

(3 Hours)

[Total Marks: 80]

- N.B.:-** (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.

- Q 1. Answer any following questions.
- A) Explain time grading and current grading used in protection system. **05**
 - B) Explain rated characteristics of contactors **05**
 - C) Draw single line diagram and show all substation devices. **05**
 - D) Why isolators, contactors and circuit breaker are used in power system. **05**
- Q 2 a) Explain construction, working, torque equation and characteristics of following **10**
 Distance relay.
 I) Reactance Relay II) Mho Relay
- Q 2 b) How transformer can be protected against incipient fault. **10**
- Q 3 a) Explain the constructional details of HRC fuse with its characteristics. Write **10**
 advantages over other type
- Q 3 b) Explain construction and working principle of vacuum circuit breaker with its **10**
 advantages and disadvantages
- Q 4 a) Explain REF protection for alternator. How 100% winding is protected in an **10**
 alternator.
- Q 4 b) Explain with neat sketch construction and working of Air circuit breaker. Write **10**
 advantages and disadvantages
- Q 5 a) Explain single phasing in induction motor. How motor is protected from single **10**
 Phasing?
- Q 5 b) Draw and explain Merz-Price protection scheme for star-delta transformer. **10**
- Q6) a) Explain high resistance and low resistance method of arc quenching. **10**
- Q6) b) Explain working principle of induction type of relays. Explain IDMT characteristics **10**