

B.TECH
(SEM VII) THEORY EXAMINATION 2022-23
POWER SYSTEM PROTECTION

Time: 3 Hours

Total Marks: 100

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt all questions in brief. 2 x 10 = 20

- (a) What are the types of protection relays?
- (b) What is summation transformer?
- (c) Why Buchholz relay is called gas actuated relay?
- (d) What are the advantages of differential relay?
- (e) Discuss about the different kind of fault and their effects.
- (f) Explain Pilot protection schemes.
- (g) What are the steps in test procedure?
- (h) Explain the properties of arc.
- (i) Why logic circuit used in protection system?
- (j) Write the advantages of computer based protection system.

SECTION B

2. Attempt any three of the following: 10 x 3= 30

- (a) Explain need of power system protection. What are the different attributes of protection system? Explain in brief
- (b) Explain following relays:
 - (i) Shaded pole type induction disc relay
 - (ii) Induction cup type relay
- (c) Draw the schematic of a Merz-price circulating method of protecting an alternator. Explain the operating principle.
- (d) Draw & describe the construction, working principle of vacuum circuit breaker.
- (e) Explain the working principle of electronic relay and its advantages.

SECTION C

3. Attempt any one part of the following: 10 x 1= 10

- (a) What is meant by primary protection? Why is back-up required? Discuss different types of back-up protection
- (b) What are the essential qualities of protective relays? Explain classification of protective scheme.

4. Attempt any one part of the following: 10 x 1= 10

- (a) Describe the operating principle, constructional features and area of applications distance relays or directional relay
- (b) Explain stepped a time-distance characteristics of three distance relaying units used for first, second and third zones of protection.

5. Attempt any *one* part of the following: 10 x 1= 10

- (a) Briefly explain the various methods of overvoltage protection of overhead transmission line
- (b) Explain in detail about the operating principle of reverse power protection of alternator.

6. Attempt any *one* part of the following: 10 x 1= 10

- (a) Briefly explain about the re-striking voltage transient and the arc interruption methods.
- (b) Write the short notes on:
 - (i) SF₆ Circuit breaker
 - (ii) Bulk oil Circuit breaker

7. Attempt any *one* part of the following: 10 x 1= 10

- (a) With the help of neat & clean diagram explain the microprocessor based digital static relay protection system.
- (b) What is level detector? Explain PNP and NPN transistor as level detector.

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