Printed Pages:2 **Sub Code:KEE077**

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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) SF_6 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.