Printed Pages: 02 **Sub Code: NEE602**

Paper Id: | 1 | 2 | 0 | 6 | 0 | 4 | **Roll No.** | | | | | | | | | | |

B.TECH.
(SEM VI) THEORY EXAMINATION 2017-18
SWITCHGEAR AND 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 x10 = 20

a. Explain what you understand by pick-up value of actuating quantity.
b. Discuss what you understand by stability of a protective relay.
c. Explain time setting of over-current relay.
d. Compare the time-current characteristics of very inverse relay with that of IDMT relay.
e. Explain briefly reactance relay characteristic on the R-X diagram.
f. What do you understand by the term 'under-reach'?
g. What type of protective device is used for the protection of an alternator against overheating of its rotor?
h. What is magnetizing inrush current?
i. Discuss the energy balance theory of arc interruption in circuit breaker.
j. Define breaking capacity of a circuit breaker.

SECTION B

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

a. Discuss the working principle, types and applications of thermal relays.
b. Explain stepped time-distance characteristics of three impedance relaying units used for I, II and III zone of protection.
c. What is carrier current protection? What are its merits and demerits?
d. Discuss the protection employed for the field winding of the alternator against ground faults.
e. Discuss the operating principle of vacuum circuit breaker. What are its advantages over other circuit breakers?

SECTION C

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

a. What are the various types of over-current relays? Discuss their area of applications.
b. Explain what you understand by primary and back-up protection. What are the various methods of providing back-up protection?

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

a. What are the different types of attracted armature type relays? Explain why they are noisy.
b. What are the different types of amplitude comparators? Discuss the operating principle of rectifier bridge amplitude comparator.

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

a. Draw and explain the characteristic of MHO relay on R-X diagram. Discuss the effect of power surge on its performance.

b. What is unit protection? Discuss the phase comparison scheme of carrier current protection.

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

a. What are the different methods of testing of circuit breakers? Discuss their merits and demerits.

b. Explain the terms: re-striking voltage, recovery voltage and RRRV. Derive expression for re-striking voltage and RRRV in terms of system voltage, inductance and capacitance.

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

a. Discuss the protection employed against loss of excitation of the alternator.

b. With a neat sketch, discuss the differential scheme for bus-zone protection.