

B.Tech III Year II Semester (R15) Regular Examinations May/June 2018

POWER SYSTEM PROTECTION

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 70

PART – A

(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- (a) What are the functions of protective relays?
 - (b) Define the operating time of a relay.
 - (c) List out the types of relays.
 - (d) What are the uses of Buchholz's relay?
 - (e) What are the merits of carrier current protection?
 - (f) What are the causes of bus zone faults?
 - (g) What do you mean by current chopping?
 - (h) Define protected zone.
 - (i) What is circuit breaker?
 - (j) What are the characteristics of SF6 gas?

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

- 2 (a) Explain the significance of primary and backup protection.
(b) What is the role of backup protection and what are the various methods of providing backup protection?

OR

- 3 Explain the nature and causes of faults. Discuss the consequences of fault on a power system.

UNIT – II

- 4 What is Buchholz relay? Which equipment is protected by it? For what type of faults it is employed? Discuss its working principle with neat sketch.

OR

- 5 (a) Explain the protection of generators against stator faults with neat sketch.
(b) Explain the inter-turn fault protection with neat block diagram.

UNIT – III

- 6 Explain the radial feeder protection using over current relay with neat block diagram and list out its advantages.

OR

- 7 (a) Explain the significance of over current relays in protection system.
(b) Explain the protection of ring main feeder using over current relays.

UNIT – IV

- 8 Discuss the recovery rate theory and energy balance theory of Arc interruption in a circuit breaker. With the help of diagram.

OR

- 9 What is resistance switching and derive the expression for critical resistance in terms of system inductance and capacitance which gives no transient oscillation?

UNIT – V

- 10 What are the causes of over voltages arising on power system? Why is it necessary to protect the lines and other equipment of the power system against over voltages?

OR

- 11 (a) List out the types of lightning arresters and write its advantages in a protection system.
(b) Describe the construction & principle of operation of valve type lightning arrester.