

61N0604**B.Tech VI Sem Main/Back (New Scheme) Examination 2025-26****Electrical Engineering****(6EE4-04) - Switchgear and Protection of Power System****Time : 3 Hours****Maximum Marks: 70****Min. Passing Marks:****Instructions to Candidates:**

Part-A: Short answer questions (up to 25 words) 10x2 marks = 20 marks. All ten questions are compulsory.

Part- B: Analytical/Problem Solving questions 5x4 marks = 20 marks. Candidates have to answer 5 questions out of 7.

Part - C: Descriptive/Analytical/Problem Solving questions 3x10 marks = 30 marks. Candidates have to answer 3 questions out of 5.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting materials is permitted during examination. (Mentioned in form No. 205)

1 _____

2 _____

Part-A**[10x2=20]**

- Q.1. What do you mean by zone of protection?
- Q.2. Discuss why the ratio of reset to pick-up should be high.
- Q.3. What are the essential qualities of a protective relay.
- Q.4. Discuss how saturation affects the accuracy of CTs.
- Q.5. What do you mean by internal and external fault.
- Q.6. What do you understand by earth fault protection.
- Q.7. What is over fluxing in transformer?
- Q.8. What do you mean by mal operation of a relay?
- Q.9. Enlist different types of CBs used for protection of power system.
- Q.10. Write down the advantages of microprocessor based relay over electromechanical relays.

PART-B**[5x4=20]**

- Q.1. What do you mean by primary and back-up protection? What are the various methods of providing back-up protection?
- Q.2. What is simple differential protection scheme? Explain its behaviour during normal condition.
- Q.3. Explain the construction and working of Buchholz relay. Which types of faults are taken care by it?
- Q.4. Discuss a protective scheme for parallel feeders.
- Q.5. The neutral point of a 50 MVA, 11 Kv alternators is grounded through a 5Ω resistance, the relay is set to operate when, there is an out of balance current of 1.T.A. The CTS have a ratio of 1000/5. What percentage of the winding is protected against a ground fault.
- Q.6. Explain loss of excitation in the context of generator protection.

Q.7. Give a brief description of block diagram of digital relay.

PART-C

[3x10=30]

- Q.1. What is magnetizing inrush current? What measures are taken to distinguish between the fault current and magnetizing inrush current? Discuss the protection scheme protecting transformer against faults but does not operate in case of magnetizing inrush current.
- Q.2. Explain with suitable diagram how DTOC relays are used for protection of a distribution feeder.
- Q.3. Discuss the effect of power surges on different distance relays.
- Q.4. What is carrier current protection? What are its merits and demerits? With neat sketch, discuss phase comparison scheme of it.
- Q.5. Write short note on (any two)
- (i) Arc-interruption theories
 - (ii) Digital relay theories protection
 - (iii) Vacuum circuit-breaker
