

TH-2 Switchgear & Protective Device

Full Marks: 80

Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10
 - a. What are the types of bus-bar arrangements?
 - b. What is symmetrical fault?
 - c. What are factors in which arc resistance depend?
 - d. What is fusing current and fusing factor?
 - e. What is inverse-time relay?
 - f. What is Merz-price circulating current scheme?
 - g. What is surge absorber?
 - h. What is Instantaneous over current relay?
 - i. What are the important relays and system used for transformer protection?
 - j. What is short-circuit KVA ?

2. Answer **Any Six** Questions 6 x 5
 - a. If the percentage reactance of an element is 20% and full load current is 50 A, then find the short circuit current.
 - b. Explain different method of arc extinction?
 - c. Explain semi-enclosed rewirable fuse and also write its limitation?
 - d. Explain the operation of induction type directional power relay.
 - e. Explain with neat diagram the Balanced earth fault protection of alternator.
 - f. Define and explain the mechanism of lightning discharge.
 - g. Explain the principle of IDMT relay.

- 3 A 3-phase transmission line operating at 10 kV and having a resistance of 1Ω and reactance of 4Ω is connected to generating station bus-bars through 5 MVA step up transformer having reactance 5%. The bus-bars are supplied by 10 MVA alternator having 10% reactance. Calculate the short circuit KVA fed to symmetrical fault at the load end of transmission line and at the high voltage terminals of transformer. 10
- 4 Explain the operation of Sulphur Hexa-fluoride (SF_6) circuit breaker with diagram and write the advantages and limitations of SF_6 circuit breaker. 10
- 5 Explain with the help of neat diagram the construction and working of Differential relay. 10
- 6 Explain the operation of Buchholz relay with neat diagram and also write its advantages and disadvantages. 10
- 7 Write short notes on: 10
- (a) Horn-gap lightning arrester
 - (b) Rod-gap lightning arrester