

## III B. Tech II Semester Supplementary Examinations, November/December-2016

**SWITCHGEAR AND PROTECTION**

(Electrical and Electronics Engineering)

Time: 3 hours

Maximum Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
 2. Answering the question in **Part-A** is compulsory  
 3. Answer any **THREE** Questions from **Part-B**

\*\*\*\*\*

**PART -A**

- 1 a) List the advantages of Oil circuit Breakers. [4M]
- b) How is definite minimum time achieved in an IDMT relay? [4M]
- c) What are the difficulties experienced in differential protection of a Generator? How are they over – come? [4M]
- d) What is the need of bus bar protection? Explain. [4M]
- e) What are the applications of static relays? [3M]
- f) What are the requirements of a good lightning arrester? [3M]

**PART -B**

- 2 a) What is resistance switching and derive the expression for the value of resistance to be inserted to reduce RRRV. [8M]
- b) What is meant by circuit breaker? Discuss the phenomenon of arc formation in a CB. [8M]
- 3 a) List the properties of SF<sub>6</sub> gas and explain how it is used in circuit breakers. [8M]
- b) Explain the Operation principle and characteristics of MHO and Off set MHO relay [8M]
- 4 a) With suitable diagram, describe the application of the Mertz-Price circulating current system to protect the alternator. What precautions must be taken in installing this system? [10M]
- b) A 3- $\phi$ , star- delta 11/6.6 KV transformer is protected by means of differential protection system. The 6.6kv delta connected side has CT ratio 600/5. Calculate CT ratio on HT side. [6M]
- 5 a) Explain about the over current protection of bus bars with relevant connection diagram [8M]
- b) Describe the protection scheme of a single feeder using Translay relay. [8M]
- 6 a) Explain the operation of static impedance relay along with its characteristics. [8M]
- b) Explain the Working principle and importance of zero crossing detectors used in the static relays. [8M]
- 7 a) What are the causes of over voltages arising in a power system? Why is it necessary to protect the lines and other equipment of the power system against over voltages? [10M]
- b) A 132 kV, 3 $\Phi$ , 50Hz overhead line 50km long has a capacitance to earth for each line of 0.0157 $\mu$ F per km. Determine the inductance and kVA rating of the arc suppression coil suitable for this system. [6M]

\*\*\*\*\*

