

Code No: RT32022

R13**SET - 1****III B. Tech II Semester Supplementary Examinations, April/May -2019****SWITCHGEAR AND PROTECTION**

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)2. Answering the question in **Part-A** is compulsory3. Answer any **THREE** Questions from **Part-B**

PART -A

- 1 a) What are the various methods of arc extinction? [4M]
- b) What do you mean by "time grading in the over current protection system? [4M]
- c) What are the different transformer faults? List the various protection schemes available for transformers. [4M]
- d) What are the various schemes of bus bar protection? [4M]
- e) State the applications of static relays? [3M]
- f) What are the various methods of overvoltage protection of over head transmission lines? [3M]

PART -B

- 2 a) Explain the working of an air blast circuit breaker with the help of diagram? [8M]
- b) Describe the operational phenomena of a vacuum Circuit breaker. [8M]
- 3 a) With the help of a neat sketch the working of a balanced beam type relay? [8M]
- b) What is an impedance relay? Discuss its principle of operation. Show its characteristics on R-X diagram. What is the merit of this relay for transmission line protection? [8M]
- 4 a) Explain with the help of line diagram the connections and functioning of differential relay for generator protection. [8M]
- b) A 120 MVA, delta/ star connected, 11/220 kV transformer is to be protected by percentage differential scheme. CTs used are having 500/5 and 400/1 respectively. Draw the sketch of complete scheme. [8M]
- 5 a) What are the requirements of protection of transmission lines? [8M]
- b) Briefly discuss the time graded over current protection for various applications with neat diagrams. [8M]
- 6 a) Explain the need of static relays protection? Mention its merits. [8M]
- b) Explain directional over current static relays with neat block diagram. [8M]
- 7 a) Describe the construction and working of a thyrite lightning arrester. [8M]
- b) Derive an expression for the reactance of the Peterson coil in terms of the capacitance of the protected line. Calculate the reactance of a coil suitable for a 33 kV, 3-phase transmission system of which the capacitance to earth of each conductor is $5\mu\text{F}$? [8M]
