



Reg. No. : .....

Name : .....

**Sixth Semester B.Tech. Degree Examination, May 2012  
(2008 Scheme)**

**Branch : ELECTRICAL AND ELECTRONICS  
08.605 : Power System Engineering – II (E)**

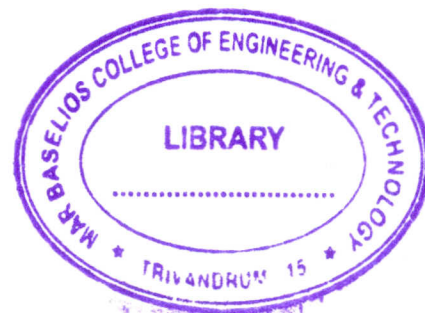
Time : 3 Hours

Max. Marks: 100

**Instruction :** Answer **all** questions from Part **A** and **three** questions from Part **B**, choosing not more than **one** question from **each** Module.

**PART – A**

1. What is meant by unbalanced fault in power systems ? What is the need for short circuit analysis in power systems ?
2. Why does the neutral grounding impedance  $Z_n$  appear as  $3Z_n$  in the zero sequence equivalent circuit ?
3. Show that the symmetrical component transformation is power invariant.
4. Explain the terms :
  - i) Asymmetrical Breaking current and
  - ii) Making current.
5. Explain what is meant by primary and back up protection.
6. Explain the principle of resistance switching. Why is it necessary in air blast circuit breaker ?



P.T.O.

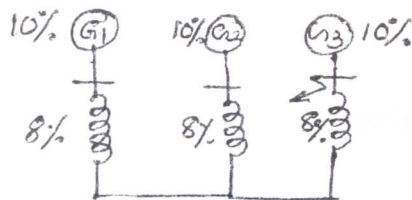


7. What are the advantages of static relays over electro mechanical relays ?
8. What are the considerations in selecting a fuse for motor protection and transformer protection ?
9. State the protections to be provided for a power transformer of above 10 MVA.
10. Discuss the principles of differential protection. (10×4=40 Marks)

### PART – B

#### Module – I

11. a) The currents in a 3-phase unbalanced system are  $I_R = 12 + j6$ ;  $I_Y = 12 - j12 \Omega$ ,  $I_B = -15 + j10$ . The phase sequence is R  $\gamma$  B. Calculate the zero, positive and negative sequence components of currents.
  - b) Draw a diagram showing interconnection of sequence networks of a double line to ground fault. Derive equations for sequence currents.
12. a) Draw sequence networks for the following
  - i) Generator
  - ii) Transformer and
  - iii) Transmission line.
- b) A generating station has three generators of capacity 10 MVA each, connected through reactors of 8% to a common bus bar shown in figure. If a fault develops on one generator find fault MVA and compare with the case when no reactors are used





**Module – II**

13. a) Explain the various ratings and testing of circuit breaker.  
b) Describe the construction, operating principle and application of vacuum circuit breaker.
14. a) Explain the construction of HRC cartridge fuse. What are its merits and demerits ?  
b) What are the different types of electromagnetic relays ? Draw a neat sketch of an induction disc relay and explain its operation.

**Module – III**

15. a) What type of protective device is used for the protection of an alternator against over heating of its  
a) stator  
b) rotor and  
c) miscellaneous protection ?

Explain each in brief.

- b) What is magnetic inrush current ? Discuss the protective scheme which protects the transformer against faults but does not operate in case of magnetizing inrush current.
16. a) What is Buchholz relay ? For what type a fault is it employed ? Describe its working principle.  
b) Explain the impulse behaviour of earthing systems.  
c) Explain the working of arc suppression coils.

**(3×20=60 Marks)**

