

(Pages : 3)

K – 4368

Reg. No. :

Name :

Sixth Semester B.Tech. Degree Examination, September 2020

08.605 : POWER SYSTEM ENGINEERING II (E)

(2008 Scheme)

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 are sequence impedances and sequence networks with respect to fault calculations?
2. Explain the harmful effects of short-circuit fault in power system.
3. What is the advantage of expressing reactances in percentage values? Discuss in detail.
4. Derive the expression for Rate of Rise of Restriking Voltage.
5. Compare fuse and circuit breaker.
6. Enumerate the essential qualities of a good protective relay.
7. Back-up protection is not a good substitute for better maintenance. Discuss.
8. Describe the principle of operation of Buchholz relay.
9. How do we select a fuse for motor protection and transformer protection?
10. What are arc suppression coils? Where and how are they used?

(10 × 4 = 40 Marks)

P.T.O.



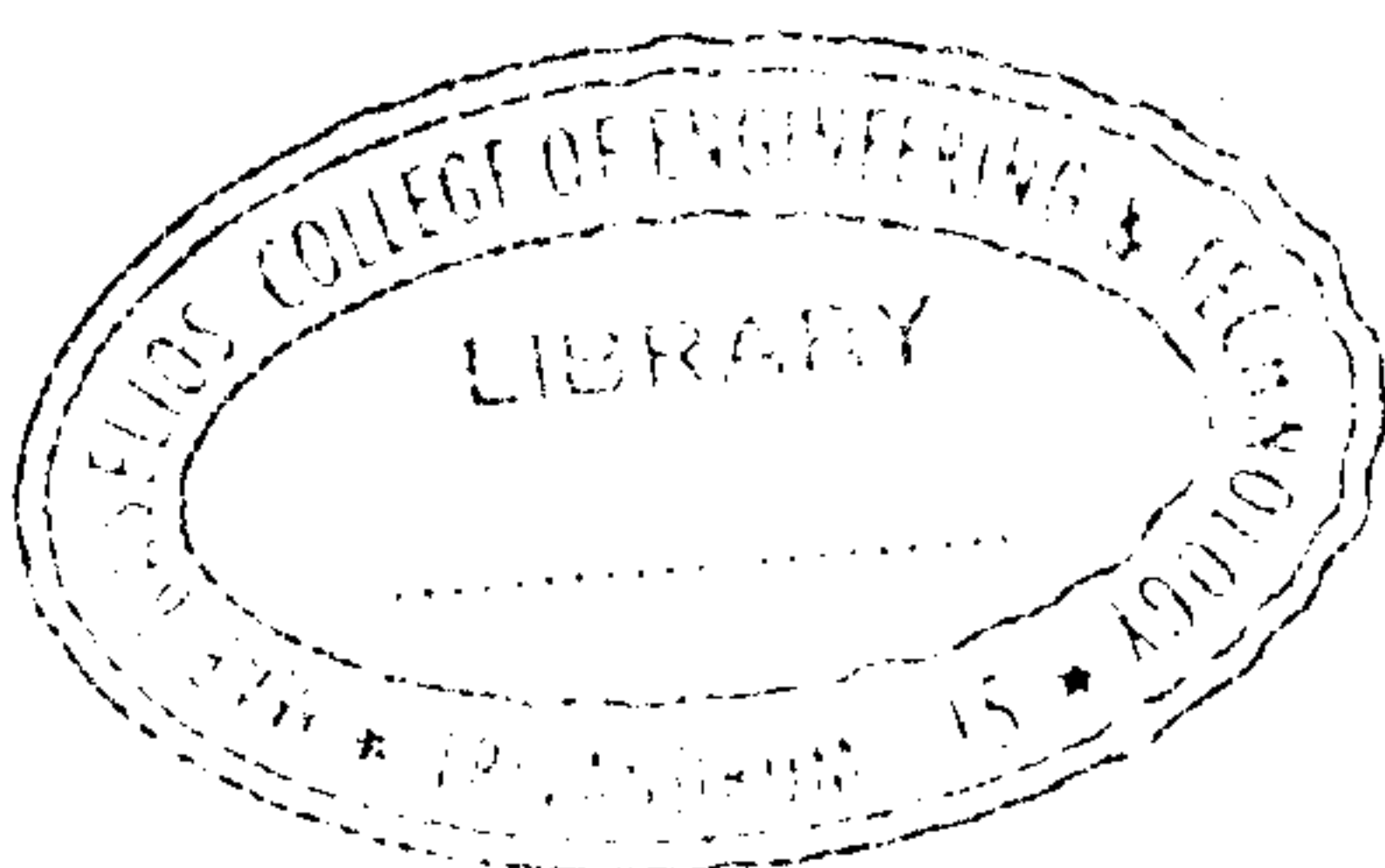
PART – B

Module – I

11. (a) Derive the current equations and draw the sequence network for a LG fault. 10
- (b) A 3-phase transmission line operating at 10 kV and having a resistance of $1\ \Omega$ and reactance of $4\ \Omega$ is connected to the generation station bus-bars through 5 MVA step-up transformer having a reactance of 5%. The bus-bars are supplied by a 10 MVA alternator having 10% reactance. Calculate the short-circuit kVA fed to symmetrical fault between phases if it occurs. 10
12. (a) Draw the sequence networks for (i) generator, (ii) transformer and (iii) transmission line. 10
- (b) Three impedances of $5-j\ 10$, $6+j\ 5$ and $3+j\ 15$ ohms, are connected in star to red, yellow and blue lines of 3300 V, 3 phase, 3 wire supply. The phase sequence is RYB. Calculate the line current I_R . 10

Module – II

13. (a) With a neat diagram, explain the construction, arc extinction, advantages and application of VCB. 10
- (b) Explain the function of protective relays in power system. How are protective relays classified? 10
14. (a) Illustrating with necessary diagrams, explain the different types of air blast circuit breakers. 10
- (b) Discuss the fundamental requirements of protective relaying. Draw a typical relay characteristics curve and define
- (i) Current setting, (ii) plug setting multiplier and (iii) time multiplier setting with respect to the curve. 10



Module – III

15. (a) What are the difficulties experienced in differential protection of generators? How are they overcome? How is an alternator protected from earth fault? **10**
- (b) What are static relays? How are they different from the conventional type? Enlist the advantages and disadvantages of static relays. **10**
16. (a) What is magnetizing inrush current in a power transformer? Discuss the protection scheme of transformer that takes care of the inrush. **10**
- (b) With the aid of block diagram and flow chart, illustrate the use of microprocessor based directional relay. **10**

(3 × 20 = 60 Marks)

