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Question Paper Code: 56302

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2021

Sixth Semester

Electrical and Electronics Engineering

15UEE602–PROTECTION AND SWITCH GEAR

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. What is the purpose of back up protection? CO1- R
 - (a) To increase the speed
 - (b) To increase the reach
 - (c) To leave no blind spot
 - (d) To guard against failure of primary
2. Plug setting of an electromagnetic relay can be altered by varying CO1- R
 - (a) Number of ampere turns
 - (b) Air gap of magnetic path
 - (c) Adjustable back stop
 - (d) All of the above
3. Relay operating speed depends on CO2- R
 - (a) Spring tension
 - (b) Rate of flux built up
 - (c) Armature core air gap
 - (d) All of the above
4. The torque production in induction type relay CO2- R
 - (a) inversely proportional to the current
 - (b) inversely proportional to the square of current
 - (c) Directly proportional to the current
 - (d) Directly proportional to the square of current
5. Unbalancing of an alternator may occur due to _____ CO3- R
 - (a) Single phase fault
 - (b) Unbalanced loading
 - (c) Line breaking
 - (d) All of the above

6. A thermal protection switch provides protection against CO3- R
 (a) Overload (b) Temperature (c) Short circuit (d) Over voltage
7. The phase comparison relay has merit that CO4- R
 (a) Its operation does not depend upon the direction of power flow
 (b) Correct relay action can be obtained by using series capacitors on the line
 (c) It can operate even for low value of fault current
 (d) None of these
8. The switch that has the fastest speed of operation is _____ switch CO4- R
 (a) Electronic (b) Mechanical (c) Electro mechanical (d) None of these
9. Air blast Circuit breaker is used for CO5- R
 (a) Over currents (b) Short duty (c) Intermittent duty (d) Repeated duty
10. The factor which influences the arc de ionization dominantly _____ CO5- R
 (a) Line voltage (b) Magnitude of transient fault current
 (c) Speed of re closure (d) All of the above

PART – B (5 x 2= 10 Marks)

11. List the essential features of switchgear. CO1- U
12. Explain the principle of differential relay. CO2- R
13. Classify the various bus bar faults. CO3- R
14. Mention the function of synthesis of simple impedance relay using Amplitude Comparator. CO4- U
15. Distinguish between recovery voltage and re striking voltage. CO5- R

PART – C (5 x 16= 80 Marks)

16. (a) Explain and draw the sequence network for the following type of faults: CO1- U (16)
 (i) Single-line-to-ground fault
 (ii) Double- line-to-ground fault
 (iii) Line-to-line fault.

Or

- (b) (i) Explain different types of earthing the neutral point of the Power system. CO1- U (16)
- (ii) Formulate an expression for the reactance of the Peterson coil in terms of capacitance of the protected line. CO1- U
17. (a) Explain the construction and working principle of impedance type distance relay with R-X diagram. CO2-U (16)
- Or
- (b) Describe the construction and principle of operation of an induction type directional over current relay. CO2-U (16)
18. (a) Discuss in detail about protection of transformer using differential protection which includes associated faults. CO3-U (16)
- Or
- (b) Give a detailed explanation about CT's and PT's and its application to power system. CO3-U (16)
19. (a) Define static relay? What are the merits and demerits of static relays over electromagnetic relays also mention its applications. CO4- U (16)
- Or
- (b) With a neat sketch discuss in detail about the synthesis of reactance relay using phase comparator. CO4- U (16)
20. (a) Explain the phenomenon of arc and arc interruption. CO5- U (16)
- Or
- (b) Explain the construction and working of SF6 circuit breaker and write its advantages and disadvantages. CO5- U (16)

