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Question Paper Code: 97304

B.E./B.Tech. DEGREE EXAMINATION, APRIL 2024

Seventh Semester

Electrical and Electronics Engineering

19UEE704 – Protection and Switchgear

(Regulation 2019)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Select the fault which occurs most common in nature CO1- U
(a) Line to Ground (b) Line to Line (c) Line to Line to Ground (d) Line to Line to Line
2. Identify the protective device given below CO1- U
(a) Fuse (b) Relay (c) Circuit Breaker (d) all of the above
3. The relay operating speed depends upon CO1- U
(a) the spring tension (b) the rate of flux built up
(c) armature core air gap (d) all of the above
4. Which one is most sensitive relay? CO1- U
(a) Universal relay (b) Differential relay (c) Distance relay (d) Overcurrent relay
5. The line currents of 3-phase supply are: $I_R = 3 + j 5 \text{ A}$ $I_Y = 2 + j 2 \text{ A}$ $I_B = -2 - j 1 \text{ A}$ The zero sequence current will be CO1- U
(a) $1 + j 2 \text{ A}$ (b) $1 + j 6 \text{ A}$ (c) $1 + j 8 \text{ A}$ (d) $1 + j 7 \text{ A}$
6. A Merz-price protection is suitable for CO1- U
(a) transformers (b) alternators (c) feeders (d) transmission lines.
7. Which one is more robust in nature? CO4- R
(a) Electromagnetic relay (b) Static (c) Over current (d) Numerical

8. The comparator which processes both magnitude and phase angle is CO4- R
 (a) Phase (b) Amplitude (c) Hybrid (d) None of the above
9. Which semiconductor device is not used in static relay? CO5- R
 (a) Transistors (b) Diodes (c) Multiplexers (d) Filter
10. SF6 gas is CO5- R
 (a) sulphur fluoride (b) sulphurdifluoride (c) sulphur hexafluorine (d) sulphur hexafluoride.

PART – B (5 x 2= 10Marks)

11. Relate “Primary Protection” with “Back-up Protection”. CO1- U
12. Illustrate the various types of electromagnetic relay. CO1- U
13. What are the different faults that may occur in the alternator? CO1- U
14. Draw the block diagram of a static relay. CO1- U
15. What is meant by Recovery Voltage? CO1- U

PART – C (5 x 16= 80 Marks)

16. (a) Explain different types of protection schemes with suitable diagrams. CO1-U (16)
 Or
 (b) Why neutral grounding is provided and compare different types of neutral grounding. CO1-U (16)
17. (a) Explain the construction and principle of operation of Electromagnetic Relay with neat block diagram. CO2-U (16)
 Or
 (b) Describe the operating principles and characteristics of impedance and MHO Relay. CO2-U (16)
18. (a) Evaluate the protective schemes employed for Bus bar protection. CO3- App (16)
 Or
 (b) Make use of the Merz-Price protection scheme for the protection of star-delta transformer. CO3- App (16)

19. (a) With neat sketches, explain the operation of static Distance Relay. CO4- App (16)
- Or
- (b) Compare the static relays with Electromagnetic Relays. CO4- App (16)
20. (a) With neat sketches, explain the construction and working principle of CO5- U (16)
about the air break and minimum oil circuit breaker.
- Or
- (b) Explain the construction and working of SF6 circuit breakers and write CO5- U (16)
its advantages and Disadvantages.

