Reg. No. : | | | | | | | | | | |

Question Paper Code: 97304

B.E./B.Tech. DEGREE EXAMINATION, APRIL / MAY 2025

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: $I_R = 3 + j\ 5$ A $I_Y = 2 + j\ 2$ A $I_B = -2 - j\ 1$ A The zerosequence current will be CO1- U

   (a) 1 + j 2 A (b)1 + j 6 A (c)1+j8 A (d) 1+J7 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- Ana

12. What is meant by Differential relay? CO1- U

13. Illustrate the importance of bus bar protection. CO1- U

14. Explain the role of Phase and amplitude comparators CO1- U

15. What is meant by Recovery Voltage? CO1- U

PART – C (5 x 16= 80 Marks)

16. (a) Why protection scheme is required in power system? Explain with suitable example CO1-U (16)

Or

(b) Explain the different qualities required for protective relaying 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) Describe the Merz-Price protective scheme for Transformer protection. CO3- App (16)

Or

(b) With neat sketches, explain the different types of protective schemes for Transmission lines. 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) Demonstrate in detail, the arcing phenomenon and arc interruption in circuit breaking. CO5- U (16)

Or

(b) Discuss the principle of operation of an air break and air blast circuit breaker. CO5- U (16)