



B.E DEGREE EXAMINATIONS: APRIL / MAY 2023

(Regulation 2018)

Sixth Semester

ELECTRICAL AND ELECTRONICS ENGINEERING

U18EET6002: Power System Protection and Switch Gear

COURSE OUTCOMES

- CO1:** Understand the principles of protection schemes and relays against faults.
CO2: Classify the various types of circuit breakers and their working
CO3: Understand the protection schemes for different power system components.
CO4: Describe and demonstrate the basic principles of digital protection.
CO5: Understand system protection schemes, and the use of wide-area measurements.

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 2 = 20 Marks)

(Answer not more than 40 words)

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|--|-----|-------------------|
| 1. List the types of faults in Power system. | CO1 | [K ₁] |
| 2. What is backup protection and why is it required? | CO1 | [K ₂] |
| 3. Mention the disadvantages of Minimum oil circuit breaker. | CO2 | [K ₂] |
| 4. What do you mean by current chopping? | CO2 | [K ₂] |
| 5. What are faults associated with an alternator? | CO3 | [K ₃] |
| 6. A 11000:110 potential transformer is used along with a voltmeter reading 87.5V. Estimate the value of line voltage. | CO3 | [K ₃] |
| 7. Mention the advantages of numerical relay over conventional relay? | CO4 | [K ₂] |
| 8. What is meant by time-graded system protection? | CO4 | [K ₂] |
| 9. Mention the purpose of df/dt relay. | CO5 | [K ₂] |
| 10. List the components of WAMS? | CO5 | [K ₂] |

Answer any FIVE Questions:-

PART B (5 x 16 = 80 Marks)

(Answer not more than 400 words)

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|--|----|-----|-------------------|
| 11. a) Write a short note about electromagnetic attracted armature type relays. | 6 | CO1 | [K ₂] |
| b) Describe the principle, construction, and operation of directional type over current relay with neat diagram. | 10 | CO1 | [K ₃] |
| 12. a) Describe the methods of extinguishing the arc in circuit breakers. | 8 | CO2 | [K ₃] |

	b)	Describe the construction and operation of SF6 circuit breaker. Mention its advantages.	8	CO2	[K ₂]
13.	a)	Describe with a neat sketch, the percentage Biased differential Merz-Price scheme protection of a modern alternator.	8	CO3	[K ₂]
	b)	What is Buchholz relay? Discuss the construction and operation of Buchholz relay.	8	CO3	[K ₂]
14.	a)	Draw and explain the block diagram of numerical relay.	8	CO4	[K ₂]
	b)	Explain the Principle of operation and characteristics of Impedance relay.	8	CO4	[K ₂]
15.	a)	Elaborate the working of Phasor measurement unit in power system.	6	CO5	[K ₂]
	b)	Explain the block diagram and architecture of Wide Area Monitoring System.	10	CO5	[K ₃]
16.	a)	Describe the construction and operation of Minimum oil circuit breaker. Mention its advantages and disadvantages.	10	CO2	[K ₂]
	b)	Explain the working of under frequency relay.	6	CO4	[K ₂]

Please indicate knowledge level (K₁toK₆) and Course Outcome level (CO1 to CO5) against each question for each subdivision.