



B.E/B.TECH DEGREE EXAMINATIONS: NOV/DEC 2024

(Regulation 2018)

Sixth Semester

ELECTRICAL AND ELECTRONICS ENGINEERING

U18EET6002 - Power System Protection and Switchgear

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. Define restriking voltage | CO1 | [K ₂] |
| 2. Write any two functions of protective relaying. | CO1 | [K ₁] |
| 3. Define current chopping. | CO2 | [K ₁] |
| 4. Differentiate between a fuse and circuit breaker | CO2 | [K ₁] |
| 5. Give reasons why secondary of transformer should not be kept open. | CO3 | [K ₁] |
| 6. What are the various faults that would affect an alternator? | CO3 | [K ₁] |
| 7. List the function of time based over current Relay? | CO4 | [K ₁] |
| 8. Mention the different types of distance protection relay. | CO4 | [K ₁] |
| 9. What is under voltage relay? | CO5 | [K ₁] |
| 10. What is meant by PMU? | CO5 | [K ₁] |

Answer any FIVE Questions:-

PART B (5 x 16 = 80 Marks)

(Answer not more than 400 words)

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|---|------|-----|-------------------|
| 11. a) Explain with neat diagram the working of voltage balance relay | (8) | CO1 | [K ₂] |
| b) Explain the various zones of protection in power system | (8) | CO1 | [K ₂] |
| 12. With a neat circuit diagram explain the construction and working of SF ₆ circuit breaker | (16) | CO2 | [K ₂] |

13. a) With neat diagram explain the operation of bucholz relay based protection of transformer? (10) CO3 [K₂]
b) Write short notes on the overcurrent protection of bus bar. (6)
14. a) Elucidate the working of hardware architecture of numerical relays. (16) CO4 [K₂]
15. a) Explain the role played by WAMS in power system protection and list the applications of WAMS. (8) CO5 [K₂]
b) Elaborate on how the PMU's aid in power system protection. (8) CO5 [K₂]
16. Describe the protection of the stator windings of the 3-phase alternator against various types of faults. (16) CO4 [K₃]
