**18EE602**

**Hall Ticket Number:**

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| **III/IV B.Tech (Regular) DEGREE EXAMINATION** | | | |
| **July, 2021** | **Electrical & Electronics Engineering** | | |
| **Sixth Semester** | **Power System Protection** | | |
| **Time:** Three Hours | | **Maximum: 5**0 Marks | |
| *Answer Question No. 1 Compulsorily.* | | | (10X1 = 10 Marks) |
| *Answer* ***ANY ONE*** *question from each Unit.* | | | (4X10=40 Marks) |

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| 1. | a) | What are the essential qualities of a protective relay. | CO1 | |  |
|  | b) | What is a back up protection? | CO1 | |  |
|  | c) | Define PSM. | CO1 | |  |
|  | d) | What is the role of comparator in a static relay. | CO2 | |  |
|  | e) | How is a sampling comparator used for realization of Mho relay. | CO2 | |  |
|  | f) | List any four merits of micro processor based relays. | CO4 | |  |
|  | g) | What are incipient faults? | CO3 | |  |
|  | h) | Which types of relays are used in Merz price protection of alternator. | CO3 | |  |
|  | i) | What is a circuit breaker? | CO5 | |  |
|  | j) | Define RRRV? | CO5 | |  |
| **Unit - I** | | | | | |
| 2. | a) | Describe the operation of Induction disc type relay with neat sketch. | CO1 | **5M** | |
|  | b) | Discuss the principle of operation and working of Buchholz relay with neat sketch. | CO1 | **5M** | |
|  |  | Or |  |  | |
| 3. | a) | Explain the principle of operation of Distance relay. | CO1 | **5M** | |
|  | b) | With a neat sketch explain the operation of a differential relay. | CO1 | **5M** | |
| **Unit - II** | | | | | |
| 4. | a) | Write a brief note on components of a static relay. | CO2 | **5M** | |
|  | b) | Explain the duality between amplitude and phase comparators. | CO2 | **5M** | |
|  |  | Or |  |  | |
| 5. |  | With a neat block and schematic diagram explain the operation of instantaneous over current relay. | CO2 | **10M** | |
| **Unit - III** | | | | | |
| 6. | a) | Explain the alternator stator winding protection schemes. | CO3 | **5M** | |
|  | b) | Briefly discuss the protection schemes of transmission lines. | CO3 | **5M** | |
|  |  | Or |  |  | |
| 7. | a) | How are transmission feeders protected against over currents? | CO3 | **5M** | |
|  | b) | What are the merits and demerits of carrier wave distance protection? | CO3 | **5M** | |
| **Unit - IV** | | | | | |
| 8. | a) | What is resistance switching? Derive the expression for critical resistance in terms of system inductance and capacitance which gives no transient oscillation. | CO5 | **5M** | |
|  | b) | With a neat sketch explain the operation of air break circuit breaker. | CO5 | **5M** | |
|  |  | Or |  |  | |
| 9. |  | With a neat sketch describe the working principle of SF6 circuit breaker. List the merits and demerits of SF6 circuit breaker. Mention applications. | CO5 | **10M** | |

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