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C20-EE-503

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BOARD DIPLOMA EXAMINATION, (C-20)

OCTOBER / NOVEMBER—2023

DEEE – FIFTH SEMESTER EXAMINATION

POWER SYSTEMS—III (SWITCH GEAR AND PROTECTION)

Time : 3 Hours ]

[ Total Marks : 80

**PART—A**

3×10=30

- Instructions :** (1) Answer **all** questions.  
(2) Each question carries **three** marks.  
(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. Define (a) Isolator and (b) Relay.
2. State the need of current limiting reactors.
3. State the basic requirements of protective relaying.
4. Write any three effects of faults on alternator.
5. State the precautions to be adopted in differential protection of transformer.
6. List any six types of faults in alternator.
7. State the necessity of busbar protection.
8. Explain pilot wire protection in brief.
9. Define SMART GRID.
10. List the advantages of MICROGRID.

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- Instructions :** (1) Answer **all** questions.  
(2) Each question carries **eight** marks.  
(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

**11.** (a) Explain the construction and working of SF6 circuit breaker with neat diagram.

**(OR)**

(b) Explain any two types of reactor schemes with neat sketches.

**12.** (a) Explain the construction and working principle of distance relay.

**(OR)**

(b) Explain the working of directional over current induction relay with diagram

**13.** (a) Explain the differential protection for stator of an alternator with neat sketch

**(OR)**

(b) Explain the working of Buchholz relaying system for the protection of transformer.

**14.** (a) Explain the protection of transmission lines using impedance relays.

**(OR)**

(b) Explain the protection of parallel feeders by using directional relays.

**15.** (a) Explain the protection of busbars with differential scheme of protection.

**(OR)**

(b) Explain the distance protection for transmission grid

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**PART—C**

10×1=10

- Instructions :** (1) Answer the following question.  
(2) The question carries **ten** marks.  
(3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

- 16.** The plant capacity of a 3-phase generating station consists of two 8000 KVA generators of reactance 12% each and 6000 KVA generator of reactance of 15%. The generators are connected to the station bus-bars from which load is taken through three 5000 KVA step up transformers each having a reactance of 5%. Determine the maximum fault MVA of the circuit breakers on (i) low voltage side and (ii) high voltage side.

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