

8E4111

Roll No. : _____

Total Printed Pages : **3**

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B. Tech. (Sem. VIII) (Main/Back) Examination, April/May-2012

Electrical Engg.

8EE3 Switchgear & Protection

Time : 3 Hours]

[Total Marks : 80

[Min. Passing Marks : 24

Attempt any **five** questions.

Selecting **one question** from **each unit**. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Unit of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.

(Mentioned in form No. 205)

1. _____ Nil _____ 2. _____ Nil _____

UNIT I

1 (a) Describe how the amplitude comparator can be converted to phase comparator and vice-versa. 8

(b) Explain the vector product type phase comparators with the help of diagrams. 8

OR

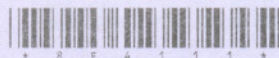
1 (a) Explain with the help of block diagram, the working of definite time static overcurrent relay. 8

(b) Briefly describe the static directional overcurrent relay with the help of neat diagram. 8

UNIT II

2 (a) Explain how the reactance relay characteristics can be realised using the static comparator. 8

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[Contd...

(b) With the help of diagram explain how an alternator is protected through percentage differential protection.

8

OR

2 (a) Briefly explain the angle impedance relay. Discuss how its characteristics can be realized using the static comparators.

8

(b) Explain the operation and working of the static distance relays in brief.

8

UNIT III

3 (a) What is out of step blocking? Discuss the operating principle of an out-of-step blocking relay.

8

(b) Explain how the power swings effects the performance of distance protection with the help of diagrams.

8

OR

3 (a) Why elliptical characteristics are used as a backup protection? How these characteristics are realized using the static comparators?

8

(b) Discuss the operation of the phase comparison carrier current protection with the help of block diagram.

8

UNIT IV

4 (a) What is resistance switching? Derive the expression for critical resistance in terms of system inductance and capacitance, which gives no transient oscillation.

8

(b) Briefly describe the following :

(i) Energy balance theory

(ii) Recovery rate theory

(4,4)

OR

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[Contd...

- 4 (a) Explain the construction, principle and operating principle of the minimum oil circuit breakers. 8
- (b) Briefly explain restricting voltage and RRRV. Derive expression for restricting voltage and RRRV in terms of system voltage, inductance and capacitance. (3,5)

UNIT V

- 5 (a) With the help of diagram, explain the working of an axial air blast type circuit breaker. 8
- (b) Briefly explain the important features which differentiates the digital relay from conventional relays. 8

OR

- 5 (a) Explain the operation and working of SF₆ circuit breakers. List the advantages of it over other types of circuit breakers. (6,2)
- (b) Briefly describe the following with reference to the rating of CB.
- (i) Breaking capacity
 - (ii) Short time current rating. (4,4)

