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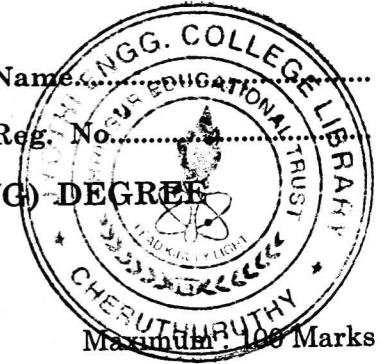
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Name.....

Reg. No.....

SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE
EXAMINATION, JUNE 2012

EE 04 704—POWER SYSTEMS—III



Time : Three Hours

Answer all questions.

Part A

1. (a) Explain the terms : (i) symmetrical breaking current ; (ii) asymmetrical breaking current ; (iii) making current.
- (b) Differentiate between a lightning arrestor and a lightning conductor.
- (c) Explain what is meant by primary protection and back up protection.
- (d) Explain the characteristics of an IDMT relay. Mention its applications.
- (e) What is a speed-time curve ? Explain its significance.
- (f) What are the advantages and applications of dielectric heating ?
- (g) With the help of a block diagram, explain SCADA system.
- (h) Briefly discuss the advantages and operational problems of HVDC transmission.

(8 × 5 = 40 marks)

Part B

2. (a) Discuss the principle of arc interruption in (i) an oil CB and (ii) air blast CB.
Or
- (b) What are the requirements of a ground wire for protecting power conductors against direct lightning stroke ? Explain how they are achieved in practice.
3. (a) With a neat sketch, explain the Merz-price circulating current scheme for protection of alternators. What are the limitations of this scheme and how are they overcome ?
Or
- (b) Classify the various types of overcurrent relays and give their applications along with approximate characteristics.
4. (a) (i) What is specific energy consumption ?
(ii) Enumerate the factors which effect this specific energy consumption of trains operating at a given scheduled speed.
(iii) An electric train while going down an incline of 1 in 200 has the following speed-time curve : (1) starting from rest a uniform acceleration of 2 kmphs for 30 sec. ; (2) steady speed for 40 sec. (with mechanical braking) ; (3) coastinf for 50 sec. ; and (4) braking at a rate of 3 kmphs.

Assume the track resistance as 45 Nw per tonne, allowance for rotational inertia 10 %, overall efficiency 70 %, calculate the specific energy consumption.

(3 + 4 + 8 = 15 marks)

Or

Turn over

(b) Discuss the construction and operation of different types of induction furnaces.

(15 marks)

5. (a) Explain various FACTS controllers.

Or

(b) (i) Explain various types of DC links.

(ii) Write short note on terminal components of HVDC transmission.

(9 + 6 = 15 marks)

[4 × 15 = 60 marks]