

G 1651

(Pages : 2)

Reg. No.....

Name.....



B.TECH. DEGREE EXAMINATION, MAY 2015

Eighth Semester

Branch : Electrical and Electronics Engineering

EE 010 803—ELECTRICAL SYSTEM DESIGN (EE)

(New Scheme—2010 Admission onwards)

[Regular/Supplementary]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.

Each question carries 3 marks.

1. State Carters coefficient.
2. Compare Single phase and three phase transformer.
3. Define water wheel and turbo alternators.
4. Write the general awareness of standards of BIS.
5. What are the general requirements of earthing ?

(5 × 3 = 15 marks)

Part B

Answer all questions.

Each question carries 5 marks.

6. Derive the output equation of d.c. machines.
7. Write short notes on Window area and window space factor.
8. Why field structure is rotating type in three phase synchronous machine ?
9. Explain BEE.
10. Draw a sketch of plate earthing.

(5 × 5 = 25 marks)

Part C

Answer all questions.

Each question carries 12 marks.

11. Explain the design specifications of d.c. machines.

(12 marks)

Or

Turn over

12. A 500KW, 460V, 8 pole, 375 r.p.m compound generator has an armature diameter of 1.1 m and a core length of 0.33 m. Design a symmetrical armature winding, giving the details of equalizers. The ampere conductors per metre are 34,000. The internal voltage drop is 4 per cent of terminal voltage and the field current is 1 percent of the output current. The ratio of pole arc to pole pitch is 0.7. The voltage between adjacent segments at no load should not exceed 15V and the slot loading should not exceed 1500 A. The diameter of commutator is 0.65 of armature diameter and the minimum allowable pitch of segments is 4 mm. Make other suitable assumptions.

(12 marks)

13. Design a three phase Transformer and Write its output equation.

(12 marks)

Or

14. Determine the main dimension of the core, the number of turns and the cross section of the conductors for a 5 KVA, 11000/400V, 50 Hz single phase core type distribution transformer. The net conductor area in the window is 0.6 times the net cross section of iron in the core. Assume a square cross section for the core, a flux density 1 Wb/m^2 , a current density 1.4 A/mm^2 and a window space factor 0.2. The height of window is 3 times its width.

(12 marks)

15. Derive the output equation of Synchronous Machine.

(12 marks)

Or

16. Determine the main dimension, turns per phase, number of slots, conductor cross section and slot area of a 250 KP, 3 phase, 50 Hz, 400 V, 1410 r.p.m, slip ring induction motor. Assume $B_{av} = 0.5 \text{ Wb/m}^2$, $a_c = 30,000 \text{ A/m}$, efficiency 0.9 and power factor = 0.9, winding Factor = 0.955, current density = 3.5 A/mm^2 . The slot space factor is 0.4 and the ratio of core length to pole pitch is 1.2. the machine is delta connected.

(12 marks)

17. Explain the Electrical wiring layout of small residential building.

(12 marks)

Or

18. Explain the design and layout of a cinema theatre.

(12 marks)

19. Explain various earthing systems.

(12 marks)

Or

20. Design Single line diagram and layout drawings of HT industrial consumer.

(12 marks)

[5 × 12 = 60 marks]

