

G 537

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Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2014

Fourth Semester

Branch : Automobile Engineering/Mechanical Engineering/Production Engineering
AU 010 406/ME 010 406/PE 010 406—ELECTRICAL TECHNOLOGY (AU, ME, PE)

(New Scheme—2010 Admission onwards)

[Regular/Improvement/Supplementary]

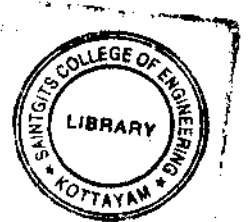
Time : Three Hours

Maximum : 100 Marks

Part A

*Answer all questions.
Each question carries 3 marks.*

1. Mention the importance of critical field resistance in DC Generators.
2. Define voltage regulation of the transformer.
3. Draw the power slip characteristics of three-phase Induction Motor.
4. What is meant by plugging ?
5. List the advantages of resistance heating.



(5 × 3 = 15 marks)

Part B

*Answer all questions.
Each question carries 5 marks.*

6. Discuss the effect of magnetic saturation on the external characteristics of a DC shunt Generator.
7. Explain the principle and operation of single-phase transformer.
8. Derive the EMF equation of three-phase alternators.
9. Explain the block diagram of an electric drive. Also mention its advantages and disadvantages.
10. Explain the working of high-frequency heating.

(5 × 5 = 25 marks)

Part C

*Answer all questions.
Each question carries 12 marks.*

11. A 4-pole DC compound generator has armature, series field and shunt field resistance of 1 Ω , 0.5 Ω and 100 respectively. The generator delivers 4 kW at a terminal voltage of 20V. Allowing 1V per brush per contact drop, calculate for both short shunt and long shunt connections, (i) The generated EMF and (ii) the flux per pole if the armature has 200 lap connected conductors and is driven at 750 r.p.m.

Or

Turn over

12. Discuss the load characteristics of DC series and compound generators.
13. Two identical 15 kW, 250 V, 1000 r.p.m. d.c. series motors are connected in series to a 250 V d.c. supply. They drive the same shaft through reduction gearing 3:1 and 4:1 respectively. If the total torque on the shaft is 630 N.m. calculate the speed of the shaft, the voltage across the each motor, and the current from the supply. Neglect losses, and assume magnetic circuit to be unsaturated.

Or

14. Explain the procedure for predetermining the voltage regulation Of the transformer from OC and SC tests.
15. Explain the working principle of Synchronous motor. Also discuss with the neat diagram for the effect of changing field excitation on synchronous motor.

Or

16. Discuss the double revolving field theory of plain single-phase induction motor. Also derive the expression for mechanical power developed.
17. Explain the various methods of braking techniques used for Industrial Drives.

Or

18. Discuss the selection of motors for : (i) Textile Mill and (ii) Hoists.
19. Explain the two transistor analogy of silicon controlled rectifier. Also discuss the VI characteristics.

Or

20. Explain the method of Induction heating and describe coreless type Induction furnace.

(5 × 12 = 60 marks)

