Code: 13A99302

R13

B.Tech II Year I Semester (R13) Regular & Supplementary Examinations December 2015

ELECTRICAL & ELECTRONICS ENGINEERING

(Mechanical Engineering)

Time: 3 hours Max. Marks: 70

Answer all questions

All questions carry equal marks

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PART – A

(Electrical Engineering)

UNIT – I

1 (a) Explain construction and the principle of operation of DC generator.

(b) A 4 pole DC generator has a lap-wound armature with 90 slots each containing 6 conductors. If the generator runs at 1500 r.p.m. The flux per pole is 0.03 Wb, Calculate the emf generated.

OR

2 (a) Derive the expression for torque developed in a DC motor.

(b) Explain the speed control methods of DC shunt motor.

UNIT – II

3 (a) Explain the principle of operation of single phase transformer.

(b) The no load ratio of a 50 Hz, single phase transformer is 6000/250 V, estimate the number of turns in each winding if the maximum flux is 0.06 Wb in the core.

OR

4 (a) Explain the various features of an ideal transformer.

(b) What are the losses in a transformer? Explain them.

UNIT – III

5 (a) Derive the expression for maximum torque in induction motor.

(b) List out various applications of Induction motors.

OR

6 (a) Explain the principle of operation of alternator.

(b) Define and explain slip of 3-phase induction motor.

PART – B

(Electronics Engineering)

UNIT – I

7 Explain in detail about forward bias and reverse bias characteristics of PN junction diode. Also illustrate the Volt- Amp characteristics of the same.

OR

8 Discuss about operation of Full wave bridge rectifier circuit and draw its input output waveform.

UNIT – II

9 Draw the CE configuration of BJT and discuss about its I/O characteristics with waveform.

OR

10 Describe about the CD configuration of JFET and illustrate its transfer characteristics with diagram.

UNIT – III

11 (a) (i) Convert the binary number101101.10101 in to decimal number.

(ii) Add and subtract the binary numbers 101101.0101 and 10001.101

(b) Construct AND and OR gates by using NOR gate

OR

12 Simplify the following expression Y = A[B+C(AB+AC)]. Draw the logic circuit for the simplified function.

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