B.Tech II Year I Semester (R13) Supplementary Examinations June 2016

ELECTRICAL & ELECTRONICS ENGINEERING

(Mechanical Engineering)

Time: 3 hours Max. Marks: 70

Answer all questions

All questions carry equal marks

*****

PART – A

(Electrical Engineering)

UNIT – I

1 (a) What is meant by residual magnetism, derive the expression for generated e.m.f in d.c shunt generator?

(b) A shunt generator has a no-load voltage of 250 V when running at a speed of 800 rpm. The terminal voltage drops by 8% when the generator is delivering full load. If the resistances of the armature and the field windings are 0.08 Ω and 92 Ω respectively, compute the: (i) Output. (ii) Input torque of the generator at full load.

OR

2 (a) Explain the principle and operation of DC machine working as motor.

(b) Discuss the characteristics of dc motors.

UNIT – II

3 (a) Obtain the equivalent circuit referred to primary side of single phase transformer.

(b) The open circuit and short circuit tests on a 4-kVA, 200/400 V 50 Hz single phase transformer gave the following results:

OC test on the LV side: 200 V, 1A, 100 W

SC test with the LV side shorted: 15 V, 10A, 85W

Determine the parameters of the equivalent circuit and draw the equivalent circuit referred to LV-side.

OR

4 (a) Explain the construction of a magnetic core of a transformer

(b) A 10 KVA, 6600/220 V, 50 Hz transformer is rated at 2.5 V/turn of the winding coils. Assume the transformer to be ideal and calculate: (i) Step-up transformation ratio. (ii) Step-down transformation ratio. (iii) The total turns of high voltage and low voltage coils. (iv) The primary and secondary currents as a step-down transformer.

UNIT – III

5 (a) Explain the relationship between slip and rotor frequency.

(b) Explain the torque slip characteristics of an induction motor for different values of rotor resistances.

OR

6 Explain the procedure for evaluating of voltage regulation by synchronous impedance method

PART – B

(Electronics Engineering)

UNIT – I

7 Explain about Zener diode and its characteristics and also explain how it works as a voltage regulator.

OR

8 Discuss about Diode switching characteristics.

UNIT – II

9 (a) A transistor has I_b = 100μA and Ic = 2mA. Find: (i) β of the transistor. (ii) α of the transistor. (iii) Emitter current Ie. (iv) If I_b changes by +25μA and Ic changes by +0.6mA, find the new value of 'β'.

(b) Explain how a transistor can act as an amplifier

OR

10 (a) A FET has a drain current of 4mA. If IDSS = 8mA and VGS off = -6 V. Find values of VGS and VP.

(b) Define αdc and βdc of a transistor and derive the relation between them.

UNIT – III

11 Find out the 9's complement of following decimal numbers: (i) 459. (ii) 36. (iii) 1697.

OR

12 (a) Convert 3C, 104, 3A0 from hexadecimal to decimal

(b) Why digital circuits are more frequently constructed with NAND or NOR gates than AND and OR gates? Explain.