

B.Tech II Year I Semester (R13) Regular Examinations December 2014
ELECTRICAL & ELECTRONICS ENGINEERING
 (Mechanical Engineering)

Time: 3 hours

Max. Marks: 70

Answer all questions
 All questions carry equal marks
 Use separate booklets for part A and part B

PART – A

(Electrical Engineering)

UNIT – I

- 1 (a) (i) Explain the operation of 3-point starter used in DC motors with neat diagram.
 (ii) Deduce the relation between torque and armature current of DC motor.

OR

- 2 (b) (i) Explain any one type of DC generators.
 (ii) A short shunt compound generator supplies 200 A at 100 V. The resistance of armature, series field and shunt field are 0.04 Ω , 0.03 Ω and 60 Ω respectively. Find E.M.F generated.

UNIT – II

- 3 (a) (i) Define efficiency and regulation of single phase transformer.
 (ii) Derive the E.M.F equation of transformer.

OR

- 4 (b) On what factors the induced EMF in the transformer windings depends. Justify the answer with appropriate derivation.

UNIT – III

- 5 (a) (i) Explain the principle of operation of induction motor.
 (ii) Define the regulation of an alternator and explain how will you find the regulation by synchronous impedance method

OR

- 6 (b) (i) What is an alternator? Write advantages of stationary armature.
 (ii) Write short notes on salient pole type alternator.

PART – B

(Electronics Engineering)

UNIT – I

- 7 (a) (i) Explain the formation of n type semiconductor.
 (ii) Explain the V-I characteristics of a diode.

OR

- 8 (b) (i) Prove that the voltage regulation for a half wave rectifier is $[(R_s + R_f)/R_L] * 100$.
 (ii) How does the reverse saturation current of diode varies with temperature? Explain.

UNIT – II

- 9 (a) (i) Explain the active region, saturation region, cutoff region in transistor characteristics.
 (ii) With help of neat diagram explain the operation of an N –channel JFET

OR

- 10 (b) (i) If the base current in a transistor is 30 μ A when the emitter current is 7.2 mA, what are the values of α and β and also calculate the collector current.
 (ii) Draw and explain the drain characteristics of n- channel enhancement type MOSFET.

UNIT – III

- 11 (a) (i) Convert the following binary numbers into decimals:
 (1) 101.01 (2) 10101.0101
 (ii) Construction of AND, OR and NOT gate by using NOR gate.

OR

- 12 (b) (i) Simplify the logical expression $(A+B).(A+\bar{B}).(\bar{A} + B)$.
 (ii) Convert the octal (1745.246)₈ number into hexadecimal number.
