R15

Code: 15A99301

B.Tech II Year II Semester (R15) Regular Examinations May/June 2017

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

(Mechanical Engineering)

Time: 3 hours Max. Marks: 70

Answer all the questions
(Use single answer booklet only)
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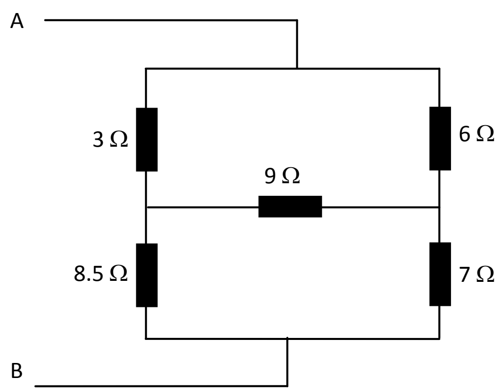
PART – A

UNIT – I

1 (a) State the Kirchhoff's voltage law and current law and explain with an example.

(b) Find the total resistance between A&B terminals for the given network.



OR

2 (a) State and explain Norton's theorem.

(b) With suitable example, explain how the star connected network is transformed to delta.

UNIT – II

3 (a) Explain the applications of different types of D.C motors.

(b) A 4-pole dc shunt generator having a field and armature resistance of 100 Ω and 0.2 Ω respectively supplies parallel connected 100 number of 200 V, 40 W lamps. Calculate the armature currents and generated emf. Allow 1 V per brush contact drop.

OR

4 (a) With neat sketches, explain how the DC Generators are classified.

(b) A 500 V shunt motor runs at its normal speed of 250 rpm when the armature current is 200 A. The resistance of armature is 0.12 Ω. Calculate the speed when a resistance is inserted in the field reducing the shunt field to 80% of normal value, and the armature current is 100 A.

UNIT – III

5 (a) Derive an expression for the induced emf of a transformer.

(b) A 3-phase, 6-pole, 50 Hz induction motor has a slip of 1% at no load and 3% at full load. Find: (i) No load speed. (ii) Full load speed. (iii) Frequency of rotor current on full load.

OR

6 (a) Explain the principle and operation of three phase induction motors.

(b) The maximum flux density in the core of 250/3000 V, 50 Hz, 1-phase transformer is 1.2 Wb/m^2. If the emf per turn is 8 V, determine: (i) Primary and secondary turns. (ii) Area of the core.

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PART – B

UNIT – I

7 Draw the circuit diagram of FWBR and explain its operation with the help of input and output waveforms and derive the ripple factor.

OR

8 Draw VI characteristics of PN junction diode and the reverse saturation current of a Silicon PN junction diode is 10 μA. Calculate the diode current for the forward bias voltage of 0.6 V at room temperature.

UNIT – II

9 Explain the input and output characteristics of a common collector transistor configuration.

OR

10 A transistor has I_b=100 μA and I_C = 2 mA, find: α, β, I_e and if $I_b$changes by +25 μA and I_C changes by 0.6 mA, then find the new value of β.

UNIT – III

11 What is the function of oscillator? How the various oscillators are classified? Explain about LC tuned type of oscillators.

OR

12 Explain about inverting and non-inverting op-amps.

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