

B.Tech I Year (R13) Supplementary Examinations December/January 2015/2016

**BASIC ELECTRICAL & ELECTRONICS ENGINEERING**

(Common to CSE and IT)

Time: 3 hours

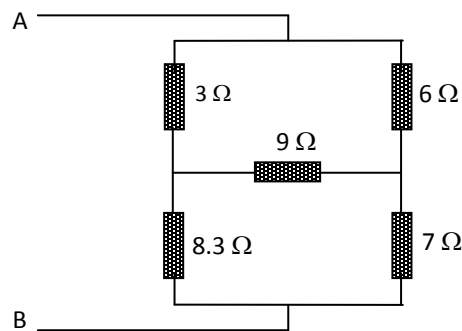
Max. Marks: 70

Answer all the questions

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**PART – A****UNIT – I**

- 1 (a) State and explain Kirchhoff's laws with suitable examples.  
 (b) Find the total resistance between A & B terminals for the given networks.

**OR**

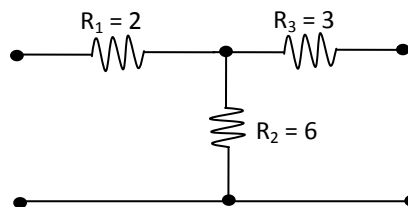
- 2 (a) Define the following terms:  
 (i) Average value. (ii) RMS value. (iii) Form factor. (iv) Peak factor.  
 (b) A sinusoidal alternating current of 6 amps is flowing through a resistance of  $40\ \Omega$ . Calculate the average voltage and the peak voltage of the supply.

**UNIT – II**

- 3 (a) State superposition theorem. Explain it with an example.  
 (b) Explain the reciprocity theorem for DC excitation.

**OR**

- 4 (a) Explain about transmission and hybrid parameters and their relations.  
 (b) Find the hybrid parameters for the given two-port network.

**UNIT – III**

- 5 (a) Explain the constructional details of DC Generators.  
 (b) Draw the characteristics of the DC Motors.  
**OR**  
 6 (a) Derive the emf equation of DC Generator.  
 (b) Mention the advantages and applications of three phase induction motors.

Contd. in page 2

**PART – B****UNIT – I**

- 7 With a neat diagram, explain the working of a PN junction diode in forward bias and reverse bias.

**OR**

- 8 Draw the circuit diagram and explain the working of Half-wave rectifier and derive the expression for a ripple factor, efficiency, peak inverse voltage, transformer utilization factor, form factor and peak factor.

**UNIT – II**

- 9 (a) Explain the operation of NPN and PNP transistor.  
(b) Find the relationship between  $\alpha$  and  $\beta$ .

**OR**

- 10 (a) Explain the construction of N channel JFET.  
(b) Compare JFET and BJT.

**UNIT – III**

- 11 (a) Derive the expression for the efficiency of oscillation and the minimum gain required for sustained oscillations of the RC phase shift oscillator.  
(b) In an RC phase shift oscillator if  $R_1 = R_2 = R_3 = 200 \text{ k}\Omega$  and  $C_1 = C_2 = C_3 = 100 \text{ PF}$ . Then find the frequency of oscillator.

**OR**

- 12 Draw the adder-subtractor circuit using Op-amp and explain its operation.

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