R13

Code: 13A99101

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

BASIC ELECTRICAL & ELECTRONICS ENGINEERING
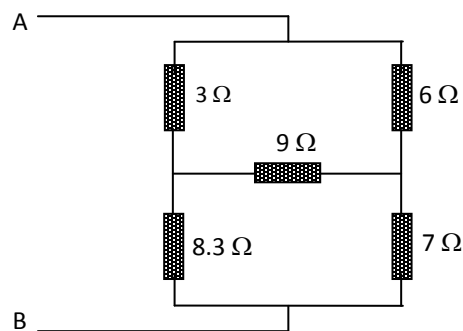
(Common to CSE and IT)

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 Ω. 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.
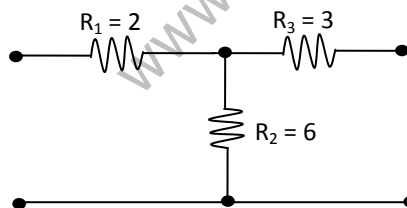
UNIT – III

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.

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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 α and β.

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 $R_1 = R_2 = R_3 = 200$ kΩ and $C_1 = C_2 = C_3 = 100$ 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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