

K. J. Somaiya College of Engineering, Mumbai-77
(Constituent College of Somaiya Vidyavihar University, Mumbai)

Semester: I October 2021-February 2022

In-Semester Examination

Class: F.Y. B. Tech

Branch: Computer/ IT

Semester : I

Full name of the course: Elements of Electrical and Electronics Engineering

Course Code:116U06C107

Duration: 1hr.15 min (attempting questions) +20 min (uploading) Max. Marks: 30

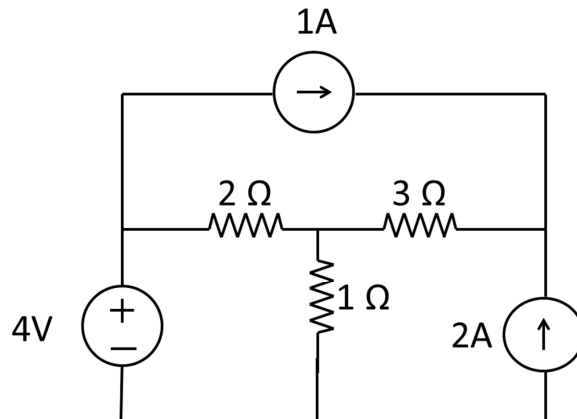
Q. No	Questions	Marks
Q1	<p>Attempt all multiple choice questions.</p> <p>1. The delta network consisting of three 300 Ohms resistors can be equivalently represented by a star network of three resistors of values _____ each.</p> <p>A. 600 Ohms B. 900 Ohms C. 150 Ohms D. 100 Ohms</p> <p>2. In the bipolar junction transistor the relative doping concentration of base, emitter and collector regions are</p> <p>A. low, high and moderate respectively. B. high, low and moderate, respectively. C. high, moderate and low respectively. D. moderate, low and high, respectively.</p> <p>3. In the bipolar junction transistor the base emitter junction and base collector junction in saturation region is _____, respectively.</p> <p>A. Forward bias and forward bias B. Forward bias and reverse bias C. Reverse bias and forward bias D. Reverse bias and reverse bias</p> <p>4. The cut-in voltage of silicon and germanium Zener diodes are _____ respectively.</p> <p>A. 0.3 V and 0.7 V B. 0.7 V and 0.7 V C. 0.7 V and 0.3 V D. 0.3 V and 0.3 V</p>	10 marks (1 MARK EACH)

	<p>5. In electronic switch application BJT is operated in</p> <ul style="list-style-type: none"> A. Saturation and Cut-off regions B. Active and Saturation regions C. Active and Cut-off region D. Saturation, Cut-off and active regions. <p>6. A DC voltage source of (10 V, 2 Ohms) connected across a Load R_L. The maximum power delivered from this source to the load R_L will be ____.</p> <ul style="list-style-type: none"> A. 50.0 Watts B. 12.5 Watts C. 100 Watts D. 25.0 Watts <p>7. Under thermal equilibrium, the depletion layer of PN junction consists of</p> <ul style="list-style-type: none"> A. Only Electrons B. Only Holes C. Both Electrons and Holes D. Neither Electrons nor Holes <p>8. An AC signal represented by $v=100 \sin (100\pi t)$ is to be rectified. The minimum peak inverse voltage rating of the diodes used in half-wave and full wave bridge rectifier must be</p> <ul style="list-style-type: none"> A. 25 V and 25 V B. 50 V and 25 V C. 50 V and 50 V D. 25 V and 50 V. <p>9. In the stage common emitter BJT voltage amplifier the voltage at collector terminal measures w.r.t ground is</p> <ul style="list-style-type: none"> A. in phase with input voltage and has no DC shift. B. in phase with input voltage and has positive DC shift. C. out of phase with input voltage and has positive DC shift. D. out of phase with input voltage and has zero DC shift. <p>10. In a common emitter single stage NPN BJT amplifier with supply voltage $V_{CC}=10V$. The ideal value of collector to emitter voltage (V_{CE}) in cut-off region is</p> <ul style="list-style-type: none"> A. 5.0 V B. 15 V C. 0.3 V D. 10 V 	
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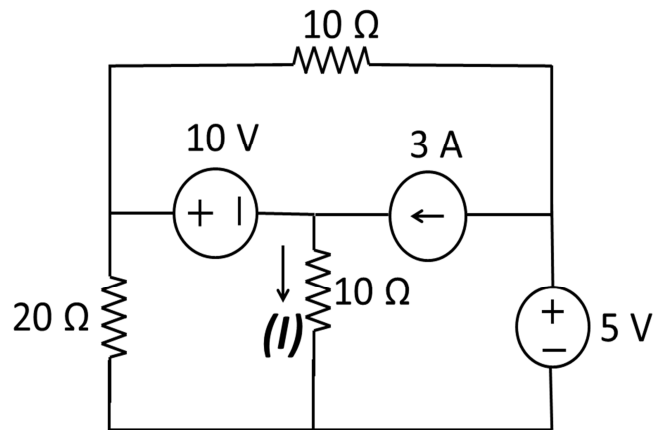
Q2

Solve Any Two of the following

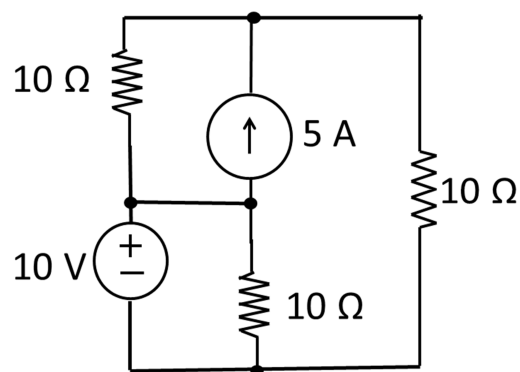
(i) Find power dissipated in 1 Ohm resistor using Mesh Analysis.



(ii) Find current (I) in the following circuit using nodal analysis.



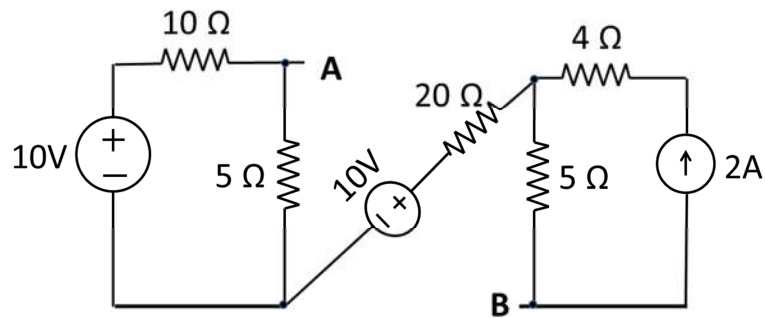
(iii) Find Voltage across 10 Ohm resistor using Thevenin's theorem.



10 marks
(5 Marks
Each)

Q3**Solve Any Two of the Following**

(i) Determine the potential difference V_{AB} in the following network.



10 marks
(5 Marks
Each)

(ii) Draw neat circuit diagram and input/output waveforms of full wave diode rectifier with center-tapped transformer. Explain the working in brief. What are the limitations of this circuit?

(iii) What is difference between PN Junction diode and Zener diode? Draw the circuit diagram of Zener diode based voltage regulator and explain its working. Define the terms line and load regulation.