

**R16**

Code No: 131AK

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech I Year I Semester Examinations, September - 2023

**BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**

(Common to EEE, ECE, CSE, EIE, IT)

Time: 3 Hours

Max. Marks: 75

Note: i) Question paper consists of Part A, Part B.

ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.

iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

**PART - A**

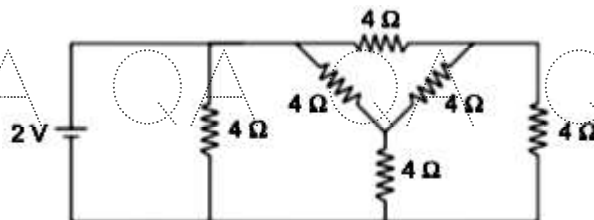
**(25 Marks)**

- 1.a) Define passive elements. [2]
- b) Write the significance of maintaining high power factor. [3]
- c) Write the condition for resonance frequency of RLC series circuit. [2]
- d) Find the value of admittance of  $z = (3 + j4)\Omega$ . [3]
- e) Draw the equivalent circuit of PN junction diode. [2]
- f) Define Ripple factor. Find the ripple factor of FWR. [3]
- g) What is the need of biasing the transistor? [2]
- h) Why silicon type transistor is preferred to germanium type? [3]
- i) What are the two types of JFET? [2]
- j) Compare BJT with JFET. [3]

**PART - B**

**(50 Marks)**

- 2.a) Determine the current delivered by the battery in the circuit shown in figure 1 below. Use star-delta conversion.



**Figure 1**

- b) Determine the root mean square value of the resultant current in a wire which carries simultaneously a direct current of 5 A and a sinusoidal alternating current of peak value 10 A. [5+5]

**OR**

- 3.a) A voltage  $e = 340\sin 314t$  is applied to a circuit and the resulting current,  $I = 42.5 \sin 314t$ , identify and hence find the value of the components. Find the value of power consumed?

- b) Find the form factor for the sinusoidal alternating voltage represented by  $v = V_m \sin \omega t$ .

[5+5]

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4.a) Draw the Norton's equivalent circuit for the below mentioned circuit across  $R_L$ .(Figure 2)

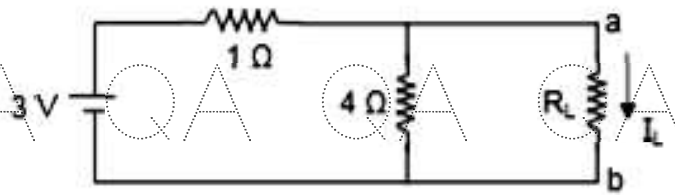


Figure 2

b) Find the current through 6 Ohm resistor and verify reciprocity theorem.(Figure 3) [5+5]

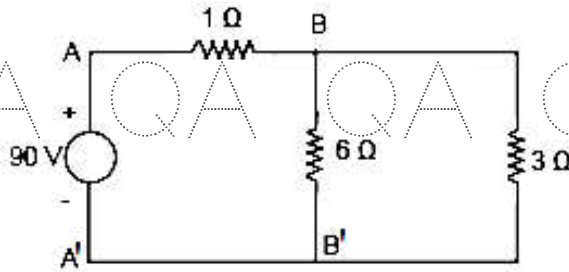


Figure 3

OR

5.a) Using Thevenin's theorem find the current  $I_0$  in the circuit shown below Figure 4.

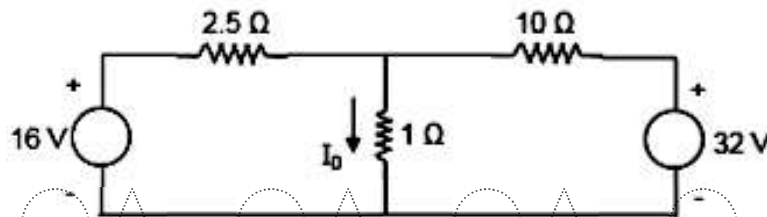


Figure 4

b) Find the value of  $R_L$ , so that maximum power is delivered to the load resistance  $R_L$ . (Figure 5) [5+5]

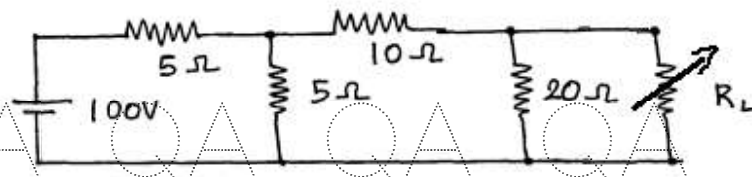


Figure 5

6.a) Explain the operation of full wave rectifier with necessary diagrams.

b) Write short notes on L- section Filters. [6+4]

OR

7.a) Write short notes on  $\pi$ - section Filters.

b) Explain the principle and operation of zener diode. [4+6]

8.a) Write short notes on voltage divider biasing of transistor.

b) Explain the working of Common Collector configuration with diagram. [5+5]

OR

9.a) Compare Common base and Common emitter configuration of BJT.

b) Briefly explain Bias compensation of BJT using diodes and transistors. [5+5]

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10. Explain the construction and working of JFET.

[10]

**OR**

11.a) Draw and explain the output characteristics of JFET.

b) Write short notes on pinch-off voltage of JFET.

[7+3]

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