

Code No: 132AJ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

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

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to CE, ME, MCT, AE, MIE)

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) Convert the given star network into an equivalent delta network (figure 1). [2]

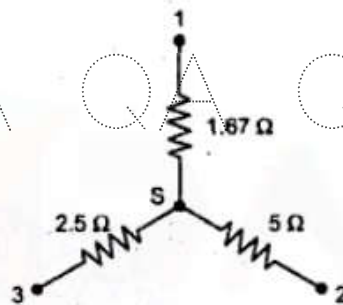


Figure 1

- b) Determine the polar form of the voltage given by $V=100 \sin (100 \pi t + \pi / 6)$. [3]
- c) What is Q-factor? How is it related to bandwidth and selectivity? [2]
- d) Draw the Thevenin's equivalent circuit for the given circuit to find the current through six Ohm resistor (figure 2). [3]

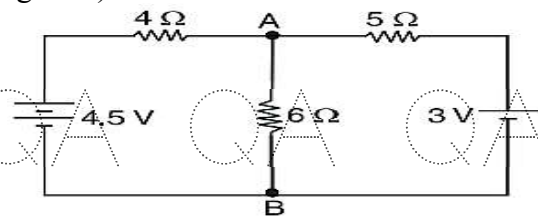


Figure 2

- e) What is the need of a bleeder resistor in a dc power supply? [2]
- f) What is the current supplied by the battery? Assume D to be an ideal diode (figure 3). [3]

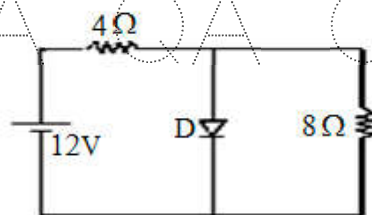


Figure 3

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- g) Draw the input and output characteristics of CB configured BJT circuit. [2]
- h) Calculate the current I_E in a common emitter connected BJT circuit if $\beta = 50$ and $I_B = 20 \mu A$. [3]
- i) What is Pinch-off voltage of JFET? [2]
- j) State the principle of operation of SCR. [3]

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PART - B

(50 Marks)

2. Using Mesh analysis find the currents through various resistors (figure 4). [10]

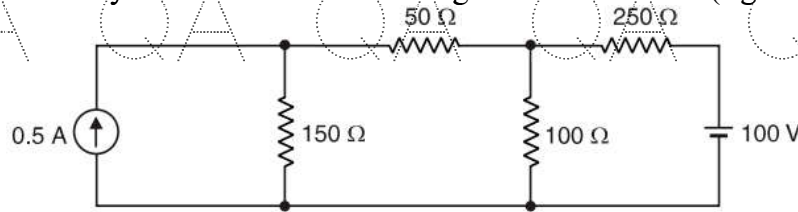


Figure 4

3. A two-element series circuit is connected across an ac source $e = 200\sqrt{2} \sin(\omega t + 20^\circ)$. [10]

The current in the circuit is $i = 10\sqrt{2} \cos(314t - 25^\circ)$.

- a) Find the impedance of the circuit?
- b) What is the value of elements in the circuit?
- c) What is the average power drawn by the circuit?
- d) Determine the power factor of the circuit.

4. Using super position theorem, determine the current through the resistor $R=1\Omega$ (figure 5). [10]

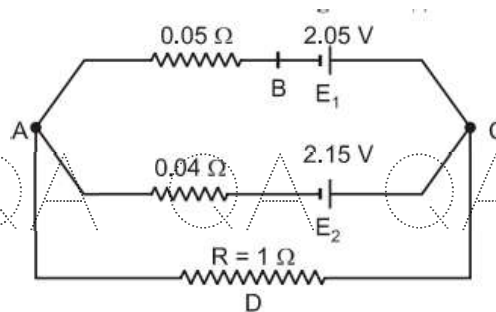


Figure 5

5. Discuss in detail the phenomenon of electrical resonance in a simple R-L-C series circuit. [10]
6. Describe the actions of Capacitor Filter, Choke filter and Capacitor input Filter. [10]

OR

7. With a neat sketch, explain the working of a half-wave rectifier and derive its rectification efficiency. [10]

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QA QA QA QA QA QA QA Q

8. Determine the current gain, input resistance, voltage gain and output resistance of common collector transistor using hybrid equivalent circuit. [10]

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9. Discuss in detail various types of biasing methods available for BJT. [10]

10. Explain the construction and working of a JFET. [10]

OR

11. Write short notes on the working of:

a) Zener diode and

b) Varactor diode.

[5+5]

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