Code No: 152AC **R18**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech I Year II Semester Examinations, February - 2025

BASIC ELECTRICAL ENGINEERING

(Common to ECE, EIE, CSBS, CSE(AI&ML), CSE(IOT), AI&DS, AI&ML)

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 a current source.	[2]
b)	Define ohm's law. How voltage and current are related in resistor?	[3]
c)	What is the use of reactive power?	[2]
d)	How line quantities are related to phase quantities in a 3-phase star connection?	[3]
e)	Draw star-delta transformer connection.	[2]
f)	How to reduce core losses?	[3]
g)	What is meant by separate excitation in d.c machines?	[2]
h)	What are the applications of 3-phase Induction Motor?	[3]
i)	What is meant by switchgear?	[2]
j)	State different wires. What are the applications of wires?	[3]

PART - B

(50 Marks)

2. In the circuit below(figure 1), find the currents, voltages and powers in all the circuit elements. [10]

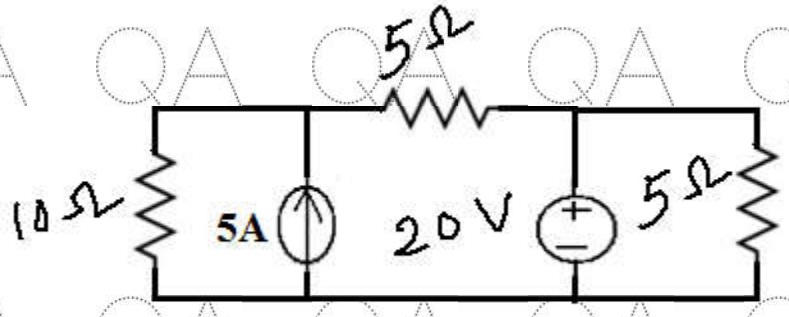

Figure 1

OR

3. In the circuit below (figure 2), determine the current in 12V source and the voltage across 3A source using superposition theorem. [10]

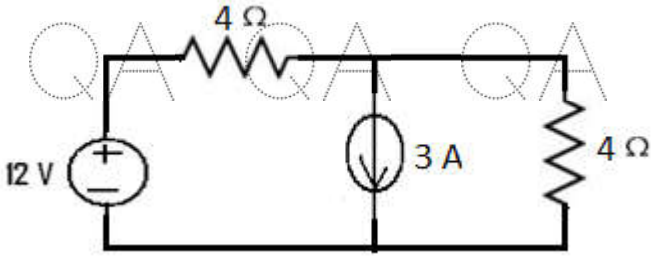

Figure 2

4. In the circuit below (figure 3), determine the value of k for the circuit to have resonance condition. Also determine the current, impedance of the circuit at resonance. Determine the half power frequencies, quality factor and bandwidth [10]

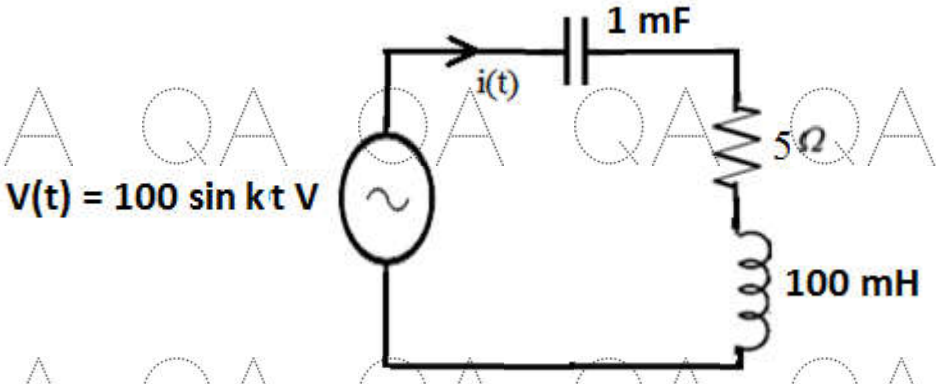

Figure 3

OR

5. Determine the power in all the circuit elements of the circuit below figure 4. [10]

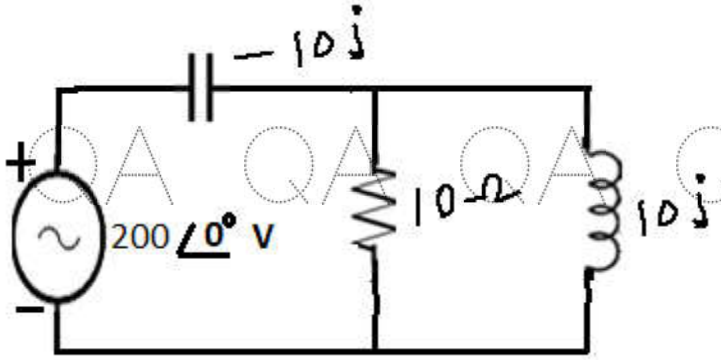

Figure 4

6.a) How the properties of practical transformer deviate from ideal transformer? Explain.

b) Draw the circuit diagram of auto transformer. Explain the operational differences of it with two winding transformer. [5+5]

OR

7.a) Explain the relationship between voltages in primary and secondary of delta-star three phase transformer connections.

b) Obtain the expression for the voltage regulation of single phase transformer for lagging load in terms of equivalent circuit parameters. [5+5]

8.a) Explain the constructional details of three phase induction motor.

b) Discuss about the working of synchronous generators. [5+5]

OR

9.a) Describe the working of separately excited DC motor.

b) What are the ways to start a 3-phase induction motor? Explain. [5+5]

10.a) Describe in detail about the working of ELCB.

b) What are the types of cables? Explain. [5+5]

OR

11.a) Describe in detail about the working of MCCB.

b) What is power factor? How to improve the low power factor? [5+5]

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