JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2024

B Tech. II Semester (CSE/IT/ECE/CE)

COURSE CODE (CREDITS): 18B11EC211

COURSE NAME: Electrical Sciences

MAX. MARKS: 25

COURSE INSTRUCTORS: Prof. Rajiv Kumar, Prof. Shruti Jain, Dr. Salman Raju, Lt. Pragya Gupta, Dr. Harsh Sohal

MAX. TIME: 1 Hour 30 Minutes

Note: (a)All questions are compulsory.

(b)Marks are indicated against each question in square brackets.

(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q1. a) Write the mesh equations for circuit shown in Fig 1. V_a is the voltage across 7Ω resistor, I_x is the current across 4Ω resistor.
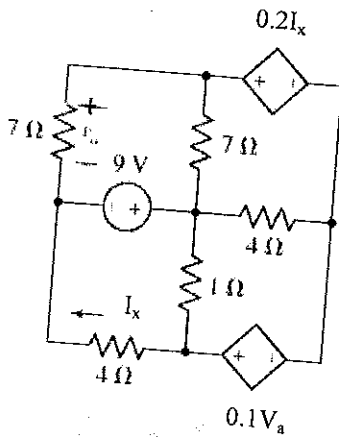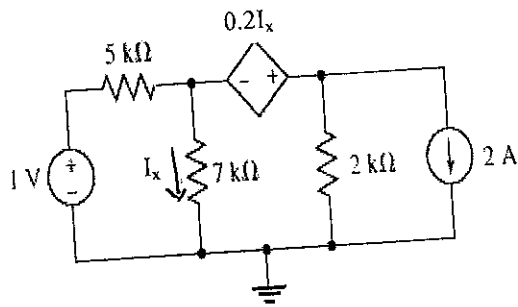

(Fig 1)
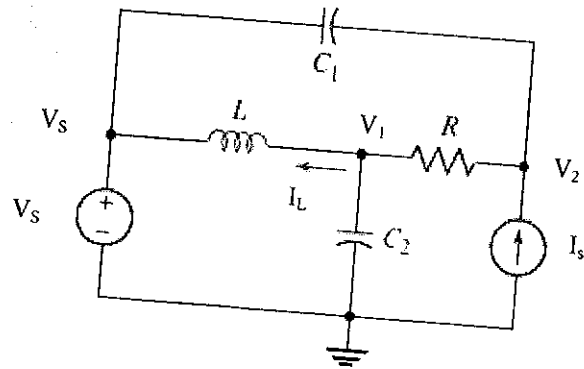
(Fig 2)

b) Write appropriate nodal equations for the circuit shown in Fig 2.
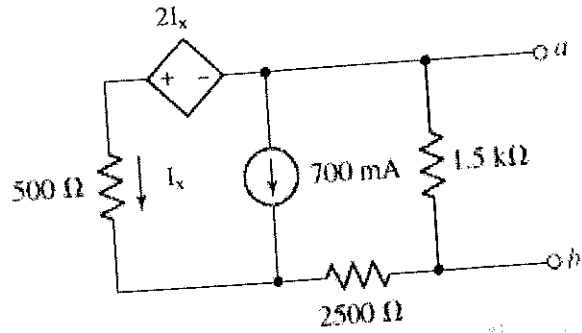
[5 + 2, CO 2]

Q2. a) Employ superposition theorem to obtain a value for the current I_x as labeled in Fig 3.
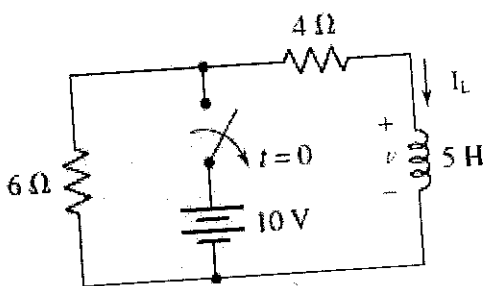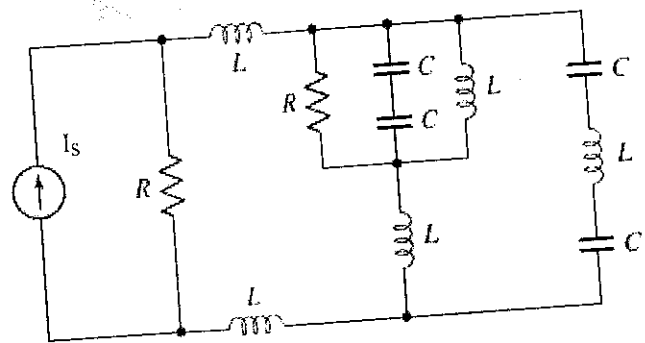
[5, CO 3]

(Fig 3)

(Fig 4)

Q3 a) Find thevenin's equivalent resistance (R_{th}) for the circuit shown in Fig 4.

b) Derive the condition for maximum power transfer to the load considering thevenin's equivalent.

[5 + 2, CO 2]

Q4. a) Determine the inductor voltage v in the circuit shown in Fig 5 for $t > 0$.

(Fig 5)

(Fig 6)

b) Reduce the circuit represented in Fig 6 to the smallest possible number of components. The value of the current source is Is

[4 + 2, CO3]