Question Paper

Exam Date & Time: 05-Dec-2023 (09:30 AM - 12:30 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

THIRD SEMESTER B.TECH END SEMESTER EXAMINATIONS, NOV-DEC 2023

NETWORK ANALYSIS [BME 2124]

Marks: 50 **Duration: 180 mins.**

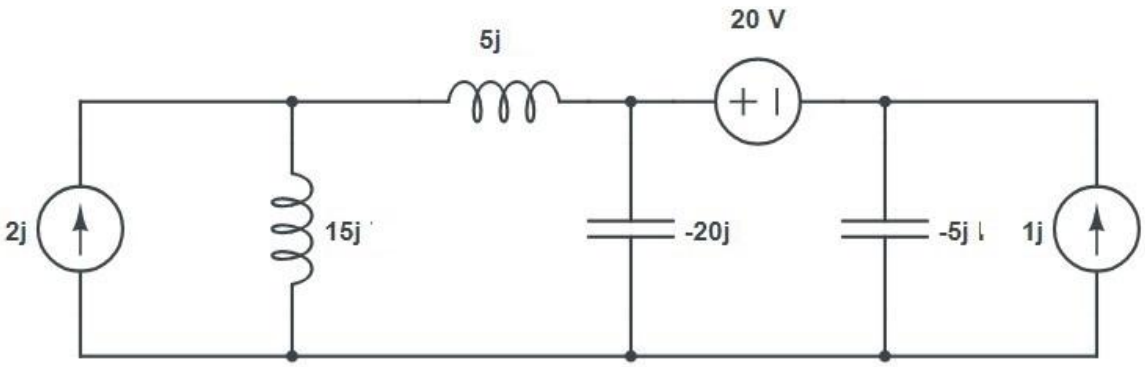
A

Answer all the questions.

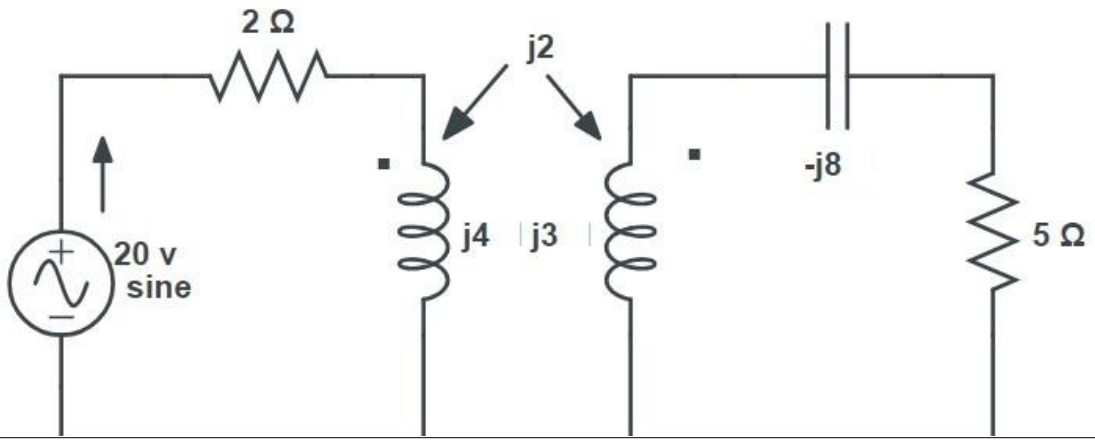
Instructions to Candidates: Answer ALL questions Missing data may be suitably assumed

1) Apply the Superposition theorem to find V_x. (4)

A)



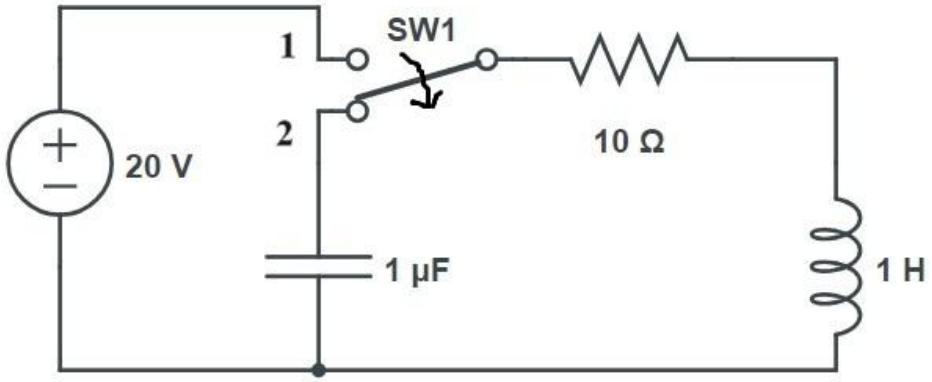
B) Analyse the coupled circuit to find current I_1 , I_2 and V_0 (3)



C) A series RLC circuit which resonates at 500 KHz has R=25ohm, L=100$_{\mu H}$ and C=1000pF. Determine the quality factor, new value of capacitor required to resonate at 500KHz, when the value of L is doubled and the new quality factor. (3)

2) The switch SW1 is changed from position 1 to 2 at t=0. Steady state condition having been reached at position 1. Determine the values of at t=0 . (3)

A)

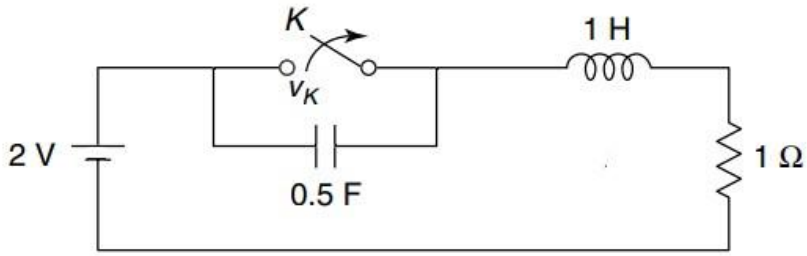


$i, \frac{di}{dt}, \frac{d^2i}{dt^2}$ +

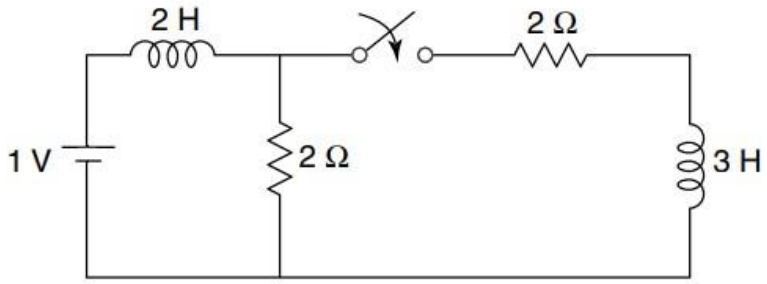
B) The network attains steady state with the switch closed. At t=0, the switch is opened. Analyse the voltage across the switch V and $\frac{dv_k}{dt}$ at (2)

k

t=0+.



C) In the network the switch is closed at t=0, the steady state being reached before t=0. Determine the current through inductor of 3H through Laplace transform. (5)



3) Solve and verify the initial and final value theorem for: (4)

A) $f(t) = e^{-t}(t+1)^2$

B) Analyse the Laplace transform: (3)

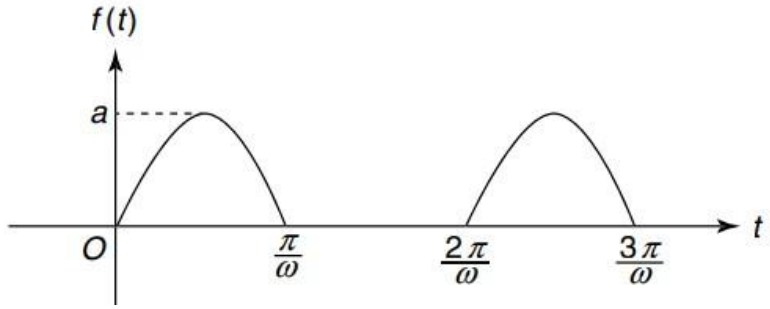
$$f(t) = \left[A + Be^{-bt}\right]u(t)$$

C) Interpret the inverse Laplace transform : (3)

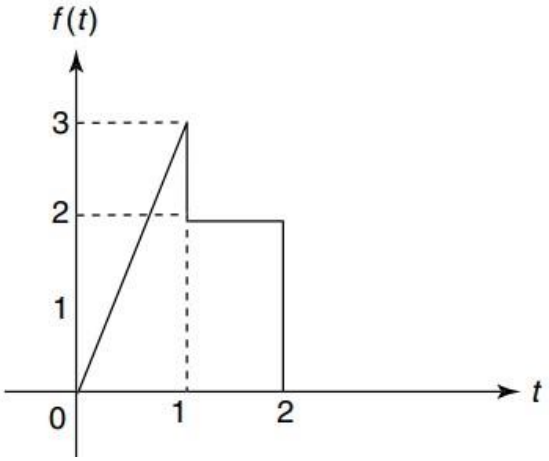
$$\frac{(3s+1)}{(s+1)(s^2+2)}$$

4) Interpret the Laplace transform of the waveform: (3)

A)



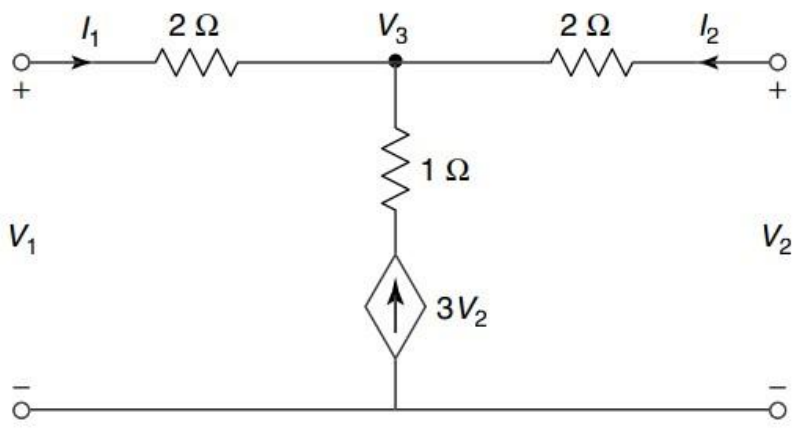
B) Using waveform synthesis, interpret the Laplace transform of the wave shown: (4)



C) Develop the parameters of Z in terms of H parameters. (3)

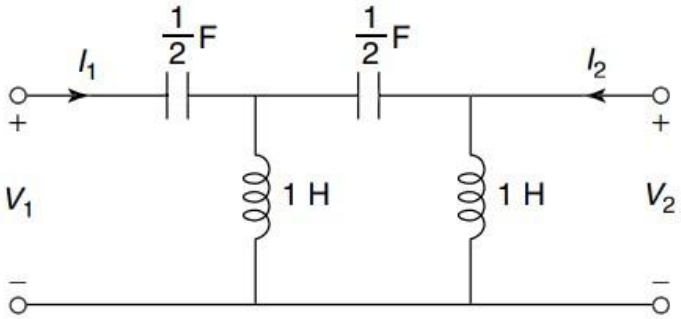
5) Analyse the two port network and interpret the Y parameters. (3)

A)



B) Develop the T parameters for a two port network. (3)

C) Analyse the two port network and interpret H parameters. (4)



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