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GIET UNIVERSITY, GUNUPUR – 765022

B. Tech (Third Semester – Regular) Examinations, December – 2020 BPCEC 3040 / BPCEL 3030 / BPCEE 3030 – NETWORK THEORY (ECE, EE & EEE)

Time: 2 hrs

Maximum: 50 Marks

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions)

(1 x 10 = 10 Marks)

Q.1. Answer **ALL** questions

- a. What is the value of total reactance of a series RLC ckt at resonance?

(i) 0.1	(ii) 01
(iii) Zero	(iv) Infinity
- b. To tune a parallel resonant ckt to a lower frequency, The capacitance must be

(i) Increased	(ii) Decreased
(iii) Remain constant	(iv) None
- c. Compensation theorem is applicable to

(i) Linear network only	(ii) Non linear network only
(iii) Both linear & non linear network	(iv) None
- d. The maximum possible mutual inductance of two coupled coils with self-inductances of $L_1=25$ mH, $L_2=100$ mH is

(i) 125 mH	(ii) 75 mH
(iii) 50 mH	(iv) Zero mH
- e. Which are the Fourier coefficients in the following?

(i) a_0, a_n and b_n	(ii) a_n
(iii) b_n	(iv) a_n and b_n
- f. For Tellegan's Theorem to satisfy, the algebraic sum of the power delivered by the source is _____ than power absorbed by all elements.

(v) Greater	(vi) Less
(vii) Equal	(viii) Greater than or equal
- g. In a series resonant circuit, the current in the circuit is

(i) Maximum	(ii) Minimum
(iii) Zero	(iv) None
- h. Find the Laplace transform of $\delta(t)$.

(i) One	(ii) Zero
(iii) Infinity	(iv) Two
- i. When the poles of the closed-loop transfer function of a given system are located in the right-half of the S-plane (RHP), the system becomes

(i) Stable	(ii) Unstable
(iii) Oscillatory	(iv) None
- j. Which Oscillations will be generated in the time domain response , if complex conjugate poles are present with negative real part?

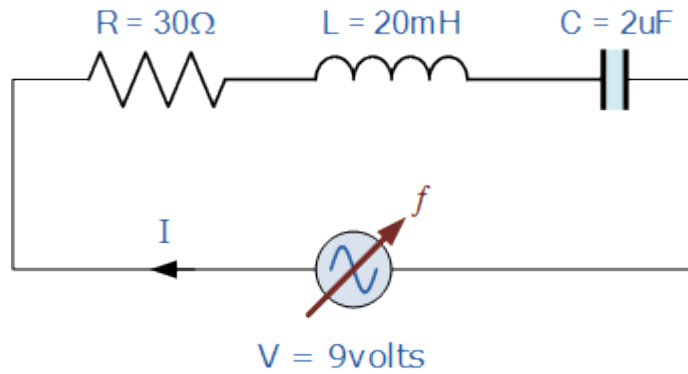
(i) Damped Oscillations	(ii) Undamped Oscillations
(iii) Sustained Oscillations	(iv) None

PART – B: (Short Answer Questions)

(2 x 5 = 10 Marks)

Q.2. Answer ALL questions

- Write hybrid parameter equations
- Write two conditions of stability of a network function.
- In a series RLC circuit, $V_R=50$ v, $V_L=150$ v, $V_C=150$ v. What is the value of source voltage?
- Write the Fourier Series of function $f(t)$.
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Calculate the resonant frequency.

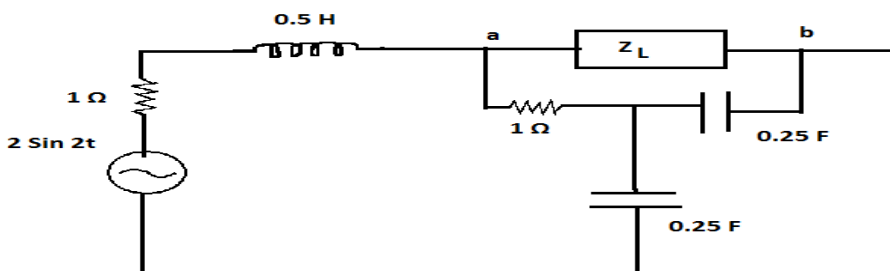
PART – C: (Long Answer Questions)

(6 x 5 = 30 Marks)

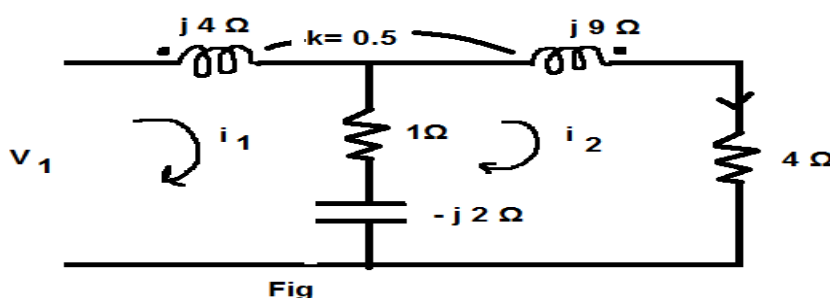
Answer ANY FIVE questions

Marks

- Find the value of Z_L for maximum power transfer in the given figure. (6)



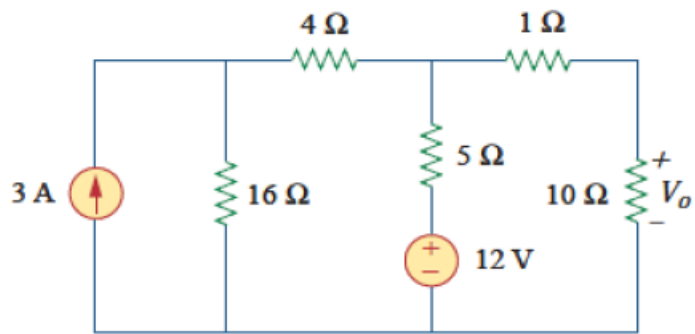
- Derive the relationship of ABCD parameters in terms of Z parameters. (6)
- $Z_s = 10 * \frac{(S^2 + 4)(S^2 + 16)}{S(S^2 + 9)}$ Check for L-C & Realize Foster 1st Form (6)
- A series resonating circuit has $R=1$ kΩ, $f_1=10$ KHz, $f_2=90$ KHz. Find Band-width, resonance frequency, L & C. (6)
- Deduce the Laplace Transformation of Ramp-Function. (6)
- Find the conductive equivalent circuit for given network. (6)



Fig

9. Find the voltage V_0 using Thevenin's or Norton's Theorem.

(6)



10. Derive h-parameters in terms of Z parameters for a 2-port network.

(6)

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