Hall Ticket Number:

Code No. : 13315

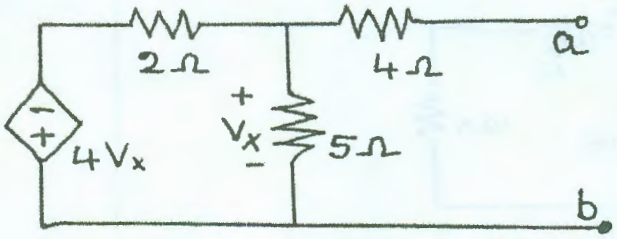
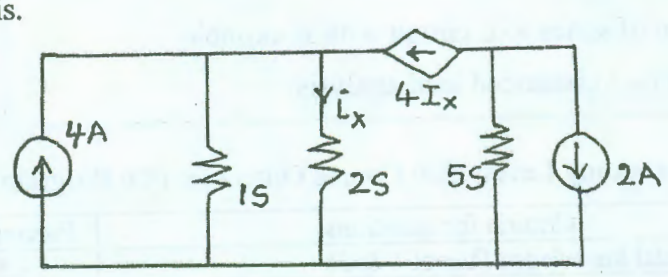
VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (EEE: CBCS) III-Semester Main Examinations, December-2018

Electrical Circuits-I

Time: **3** hours Max. Marks: **60**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Q. No	Stem of the Question	M	L	CO	PO
	Part-A (10 × 2 = 20 Marks)				
1.	Write down the voltage and current relationship in passive elements.	2	1	1	1
2.	State and explain Kirchhoff's laws.	2	2	1	1
3.	Which elements are known as linear & non linear elements and justify it.	2	2	2	1
4.	The applied voltage to a series circuit is $v(t)=50\ \mathrm{Sin}(2000t-25^0)$ volts and the resultant current through the circuit is $i(t)=8\ \sin(2000t+5^0)$.Find the circuit elements.	2	4	2	1,3
5.	State and explain Tellegen's theorem.	2	2	3	1
6.	Find Norton's equivalent circuit for given network. 	2	3	3	1
7.	What is the power factor at half power points and describe it.	2	6	4	1
8.	Define quality factor in series resonance.	2	2	4	1
9.	Define coefficient of coupling.	2	2	5	1
10.	Derive the relationship between line and phase voltages in a star connected 3-phase circuit.	2	5	5	1
	Part-B (5 × 8 = 40 Marks)				
11. a)	Classify the Dependent & independent energy sources and explain briefly with diagrams.	4	2	1	1
b)	Find the power delivered by the 2A current source for a given network using nodal analysis. 	4	4	1	1,3
12. a)	How would you explain RMS and Average values of an alternating quantity?	4	2	2	1
b)	A coil having a resistance of 10 ohms and an inductance of 0.2H is connected in series with a 100μF capacitor across a 230V, 50Hz supply. Calculate i) The active and reactive components of the current ii) The voltage across the coil. Draw the phasor diagram.	4	4	2	1,3

Contd... 2

Code No. : 13315

13. a) State and explain the superposition theorem and its limitations.	4	2	3	1
b) Find the Thevenin's equivalent circuit of the circuit shown in below Figure. As seen from i) terminals a-b ii) terminals c-d	4	3	3	1,3
14. a) Define resonance and Explain graphical representation of series resonance.	4	2	4	1
b) An RLC series circuit hits a resonant frequency of 10^6rad/sec and a band width of 1000 rad/sec. At resonance an applied voltage of 0.05V causes a current of 5mA. Find i) The values of R,L and C ii)Voltage across L&C iii) frequencies at which current will reduce by a factor of 0.707 .	4	5	4	1,2
15. a) Find the voltage across the 10Ω resistor for the given network.	4	2	5	1,2
b) A 3ϕ,4 wire,380V supply is connected to an unbalanced load having phase impedances of $Z_R=(4+j3)\Omega$,$Z_Y=(4-j3)\Omega$ and $Z_B=2\Omega$. Impedance of the neutral wire is $Z_n=(1+j2)\Omega$. Find the phase currents and voltages of the load.	4	2	5	1,3
16. a) Derive the expression for star connected resistances in terms of delta connected system.	4	2	1	1
b) In a circuit v = 100∠30°, I = 20∠-75°, obtain complex power, power factor, active power and reactive power. Draw power triangle.	4	4	2	1,2
17. Answer any ***two*** of the following:				
a) Maximum power transfer theorem	4	2	3	1
b) Admittance Locus diagram of series R-L circuit with R variable.	4	2	4	1,2
c) Millimans method of 3-phase unbalanced load analysis.	4	2	5	1

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

S. No.	Criteria for questions	Percentage
1	Fundamental knowledge (Level-1 & 2)	65
2	Knowledge on application and analysis (Level-3 & 4)	25
3	*Critical thinking and ability to design (Level-5 & 6) (*wherever applicable)	10