Silicon

beyond boundary

Silicon Institute of Technology

Silicon Hills, Bhubaneswar

| An Autonomous Institute |

2nd Semester B.Tech. Mid Term Examination 2019-2020

BASIC ELECTRICAL ENGINEERING(18ESIT02)

Duration: 01:30 Full Marks: 25

1 *Answer All*

a Mark the correct option from the following choices. 1

For a series RC circuit excited by a dc voltage V_0, the initial current is:

(a) zero (b) infinity

(c) V_0/R (d) V_0/C

b What is the power consumption for a purely capacitive circuit? 1

2 *Answer any Two*

a What is the difference between Thevenin"s theorem and Norton"s theorem? 2

b How will you prove that efficiency under maximum power transfer conditions is 50%? 2

c Three resistances of 3 ohms each are connected in delta. What is the value of the resistance in equivalent star? 2

3 *Answer any Two*

a What is an impedance triangle? Draw the impedance triangle for a series R-L circuit and series R-C circuit. 2

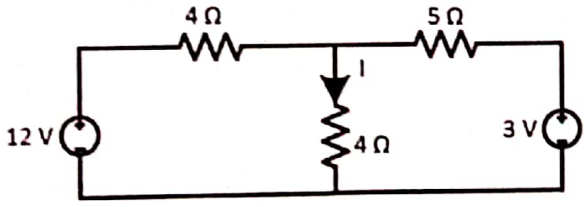
b A 125V ac source supplies a series circuit consisting of a 20.5μF capacitor and a coil whose resistance and inductance are1.06Ω and 25.4mH, respectively. The source frequency is adjusted so as to bring the circuit to resonance. Determine source frequency. 2

c A current of 10A flows in a circuit lagging behind the applied voltage of 100V,50Hz, by 30^0. Determine the value of resistance, reactance, and impedance of the circuit. 2

4 *Answer any Two*

a State and explain the maximum power transfer Theorem with an example. 5

b Find the current I using superposition theorem. 5



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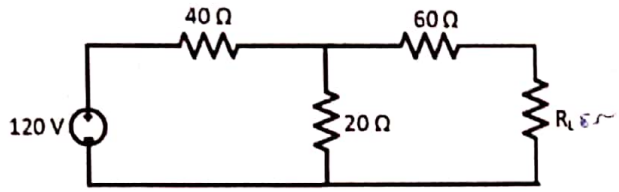
c Find the value of load resistance R_L for maximum power transfer. Also, determine the maximum power. 5



5 *Answer any One*

a State the condition for resonance to occur in a series R-L-C a.c circuit and derive an expression for the resonant frequency. Also, draw the resonance curve and explain its properties. 5

b An Impedance $Z_a=(2+j3)\ \Omega$ is connected in parallel with another impedance $Z_b=(1-j2)\ \Omega$. If the input reactive power is 100 VAR, what is the total active power? 5

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