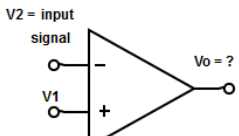


Semester: February 2021 – June 2021 Examination: ESE Examination		
Programme code: 01 Programme: B.TECH	Class: FY	Semester: I and II (SVU 2020)
Name of the Constituent College: K. J. Somaiya College of Engineering	Name of the Department ALL Branches	
Course Code: 116U06C107	Name of the Course: Elements of Electrical and Electronics Engineering	
Duration : 1 Hour 45 Minutes	Maximum Marks : 50	
Instructions: 1)Draw neat diagrams 2) Assume suitable data if necessary		

Question No.		Max Marks
Q1 (A)	<p>Attempt following Objective / MCQ type questions:</p> <p>1) What is the correct expression for the phase angle in an RLC series circuit?</p> <p>a) $\phi = \tan^{-1}(X_L - X_C)/R$ b) $\phi = \tan^{-1}(X_L + X_C)/R$ c) $\phi = \tan(X_L - X_C)/R$ d) $\phi = \tan^{-1}(X_L - X_C)$</p> <p>2) Determine the output from the following circuit (V_1 is connected to ground)</p>  <p>a) 180° in phase with input signal b) 180° out of phase with input signal c) Same as that of input signal d) Output signal cannot be determined</p> <p>3) A practical voltage source can also be represented as _____</p> <p>a) a resistance in series with an ideal current source b) a resistance in series with an ideal voltage source c) a resistance in parallel with an ideal voltage source d) none of the mentioned</p> <p>4) The voltage transformation ratio of a transformer is equal to the ratio of _____</p> <p>a) Primary turns to secondary turns b) Secondary current to primary current c) Secondary induced e.m.f. to primary induced e.m.f. d) Secondary terminal voltage to primary applied voltage</p>	10

	<p>5) If there are 10 nodes in a circuit, how many equations do we get?</p> <ul style="list-style-type: none"> a) 10 b) 9 c) 8 d) 7 <p>6) In a three-phase induction motor, frequency of the rotor current is —</p> <ul style="list-style-type: none"> a) Equal to the supply frequency b) Proportional to the slip and supply frequency c) Equal to the one less than supply frequency d) Equal to the synchronous speed <p>7) In a balanced three-phase system-delta load, if we assume the line voltage is $V_{RY} = V \angle 0^\circ$ as a reference phasor. Then the source voltage V_{BR} is?</p> <ul style="list-style-type: none"> a) $V \angle 120^\circ$ b) $V \angle 240^\circ$ c) $V \angle -240^\circ$ d) $V \angle -120^\circ$ <p>8) If Current and Voltage are 90 Degree Out of Phase, Then the Power (P) will be _____.</p> <ul style="list-style-type: none"> a) Infinite b) Maximum c) Minimum d) Zero <p>9) In ac circuit, resistance 5 ohm is connected with a capacitor having capacitive reactance 12 ohm. Supply of 260 V is connected to the circuit. Calculate the voltage across a capacitor.</p> <ul style="list-style-type: none"> a) 300 V b) 200 V c) 240 V d) 100 V <p>10) Norton resistance is found by _____</p> <ul style="list-style-type: none"> a) Shorting all voltage sources b) Opening all current sources c) Shorting all voltage sources and opening all current sources d) Opening all voltage sources and shorting all current sources 	
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Q1 (B)	<p>Attempt any FIVE questions out of the following :</p> <ol style="list-style-type: none"> 1) For a three phase, three wire system, the two wattmeter readings are 4KW and 2K Watts respectively. Calculate the power factor? 2) Draw and explain output characteristics of BJT. 3) Differentiate between idea and practical OPAMP. 4) Explain iron loss in transformer. 5) Replace the network of sources shown below with I_{bb}': <div data-bbox="339 548 970 862" data-label="Diagram"> </div> <ol style="list-style-type: none"> 6) Show that the average power consumed by a pure capacitor is zero. 7) Find the value of E to produce a current of 0.3 A in 400 ohm resistor. <div data-bbox="363 1025 933 1294" data-label="Diagram"> </div>	10
Q. 2	<p>Solve any two of the following:</p> <ol style="list-style-type: none"> 1) Draw the phasor diagram of transformer on load. (Capacitive load) 2) Draw the phasor diagram of three phase star connected circuit for lagging power factor. 3) Explain construction, working and applications of three phase induction motor with neat diagram. 	10
Q. 3	<p>Solve any two of the following:</p> <ol style="list-style-type: none"> 1) An R-L-C series circuit has $R = 10 \Omega$, $L = 0.2 \text{ H}$ and $C = 40 \mu\text{F}$. It is connected across 100 V supply. Find resonance frequency, current, PF, power, Q factor, potential difference across R, L, C, half power frequencies and bandwidth. 	20

2) Three identical coils each having reactance of $20\ \Omega$ and resistance of $10\ \Omega$ are connected in star across 440 volt three phase line. Calculate line current, phase current, active power, reactive power, apparent power, readings of each wattmeter connected to measure the power.

3) Find current through $10\ \Omega$ using super mesh analysis

