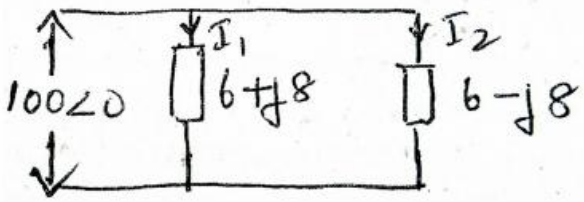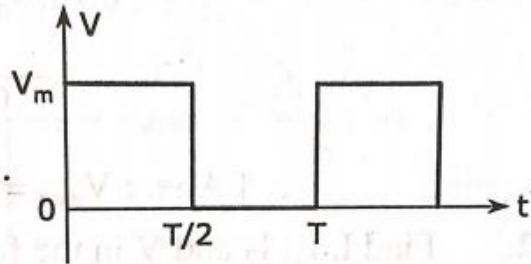# St. Francis Institute of Technology (Engg. College)
Internal Assessment Test-II
Academic Year: 2017-2018

Branch: FE (All Branches)	Year: F.E Semester: I
Subject: Basic Electrical Engineering	Time: 2:00pm -3:00 pm
Date: 17/10/2017	No. of Pages: 01
Marks: 20 Marks	

Instructions: Candidates should read carefully the instructions printed on the question paper and on the cover of the Answer Book, which is provided for their use.

Note the following instructions.

1. All questions are compulsory.
2. Draw neat diagrams wherever necessary.
3. Write everything in ink (no pencil) only.
4. Assume data, if missing, with justification.

Q.1.	Attempt any five.	
a.	A series RLC circuit is supplied with $v(t) = 10sin(1000t)\ volts$. If the peak voltage across the capacitor is 400 V, find the quality factor of the circuit.	2M
b.	A voltage of 150V, 50Hz is applied to a coil of negligible resistance and inductance 0.2H. Write the equations for voltage and current	2M
c.	Derive an expression for the average value for sinusoidally varying current in terms of peak value.	2M
d.	Find the value of currents I_1 and I_2	2M
e.	Find the average value of the following waveform.	2M

f.	Draw voltage and current waveforms for pure inductive ac circuit also draw phasor diagram.	2M
Q.2.	Attempt any one.	
a.	Impedance of a circuit is observed to be capacitive and decreasing from 1Hz to 100Hz. Beyond 100Hz, the impedance starts increasing. Find the values of circuit elements if the power drawn by this circuit is 100W at 100Hz, when the current is 1A. The power factor of the circuit at 70Hz is 0.707.	5M
b.	A coil of 31.8mH inductance with a resistance of 12Ω is connected in parallel with a capacitor across a 250V, 50Hz supply. Determine the value of capacitance, if no reactive current is taken from supply.	5M
Q.3.	Attempt any one.	
a.	If two impedances $Z_1 = (6 + j8)$ Ω and $Z_2 = (8 - j6)$ Ω are connected in parallel with each other and a voltage sources of 100V is applied across the parallel combination. Draw the circuit diagram, Find current through each branch and power factor of each branch, power consumed by each impedances.	5M
b.	An RLC series circuit has a current that lags behind applied voltage by 45 degrees. The voltage across the inductance has maximum value equal to twice the maximum value of voltage across capacitance. The voltage across inductance is 300sin (1000t) and R = 20Ω. Find the values of inductance and capacitance.	5M