CLASS: B.TECH/IMSC.   SEMESTER : I
BRANCH: BT/CIVIL/CHEMICAL/MECH/PIE/FT/PHYSICS   SESSION : MO/2023

SUBJECT: EE101 BASIC OF ELECTRICAL ENGINEERING
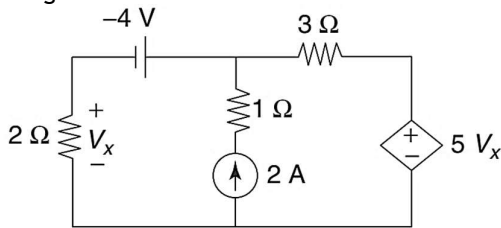TIME: 02 Hours   FULL MARKS: 25

INSTRUCTIONS:
1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates
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			CO	BL

Q.1(a)   Define (i) bilateral and unilateral elements (ii) active and passive elements.   [2]   CO1   BL1
Q.1(b)   Apply mesh analysis to calculate the current through the 3Ω resistor and the voltage Vx of   [3]   CO1   BL3
         the given circuit.

Q.2(a)   Apply KVL/KCL to calculate the value of i_x and v in the given circuit.   [2]   CO1   BL3
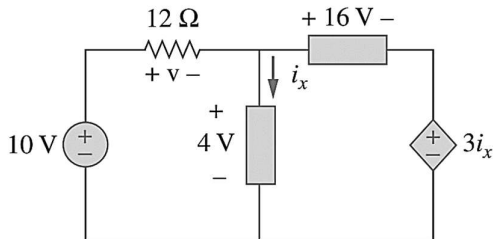
Q.2(b)   Apply star delta conversion, to estimate the equivalent resistance R_{ab} across the   [3]   CO1   BL3
         terminals a-b and the current i in the circuit below.
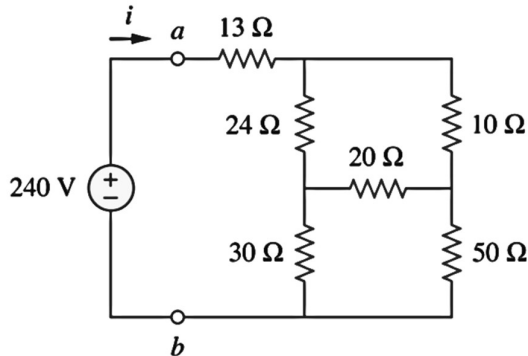
Q.3(a)   For the circuit given below, calculate the current, voltage and power associated with the   [2]   CO1   BL3
         20kΩ resistor.
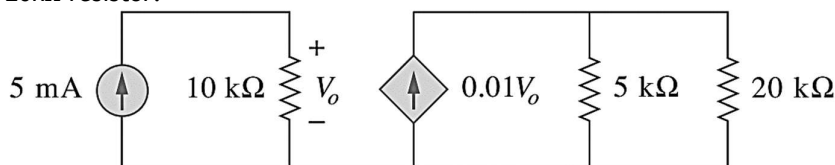
Q.3(b)   Two impedances of (14 + j5) Ω and (18 + j10) Ω are connected in parallel across a 200 V,   [3]   CO2   BL3
         50 Hz AC supply. Determine (i) the current in each branch and total current, (ii) the power
         factor of each branch, and (iii) draw the phasor diagram.

Q.4(a) Define the RMS value and average value of a signal. [2] CO2 BL1

Q.4(b) Calculate the RMS and average value of the waveform shown below: [3] CO2 BL3
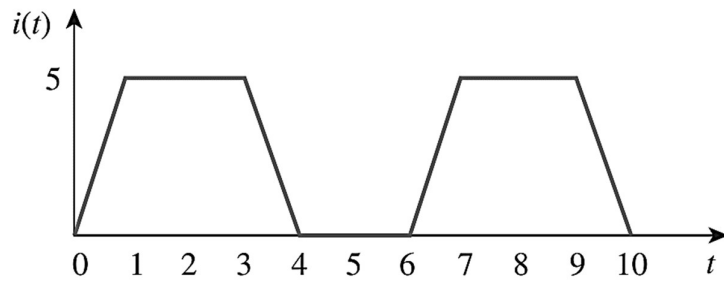
Q.5(a) Define (i) Q-factor and (ii) Bandwidth [2] CO2 BL1

Q.5(b) A series resonant circuit has an impedance of 500 Ω at resonant frequency. Cut-off frequencies are 10 kHz and 100 Hz. Calculate (i) resonant frequency, (ii) value of L, C, and (iii) quality factor at resonant frequency. [3] CO2 BL3