JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- FEBRUARY 2019

B.Tech IV Semester (BT)

COURSE CODE: 15B11EC411

COURSE NAME: BASIC ELECTRONICS

COURSE CREDITS: 04

MAX. MARKS: 15

MAX. TIME: 1 hr.

Note: *All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.*

Q1. (a) In the circuit shown in Fig. 1, calculate the power supplied by the voltage source. (2)

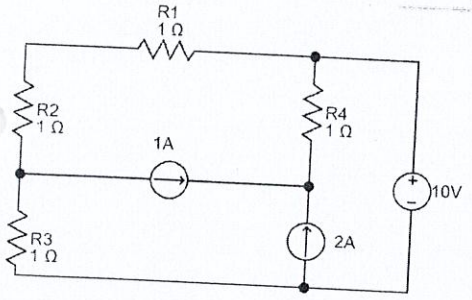

Fig. 1

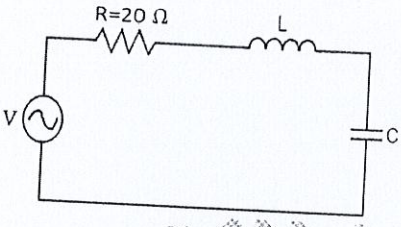

Fig. 2

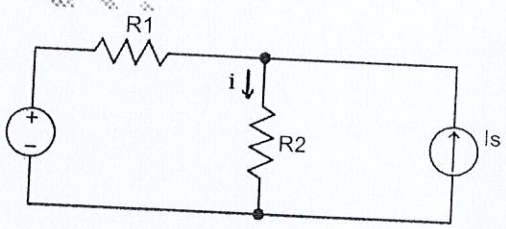

Fig. 3

(b) Series RLC circuit shown in Fig. 2 has a resistance R of 20Ω and current lags the voltage by 45 degree. If the voltage across inductor is twice the voltage across the capacitor, find the value of inductive reactance. (2)

(c) An independent voltage source has an open circuit voltage of 24V and an internal resistance of 0.75Ω. Transform the voltage source into an equivalent current source and draw its equivalent circuit which supplies a load of 10Ω. (1)

Q2. (a) Discuss phasor diagram and impedance in case of series RLC circuit. Draw the current and voltage waveforms when $X_L > X_C$ and $X_L < X_C$. (2)

(b) If R_1=5Ω, R_2=10Ω, V_s=10V, and I_s=3A in the circuit shown in Fig. 3, find the current 'i' by using the superposition theorem. (2)

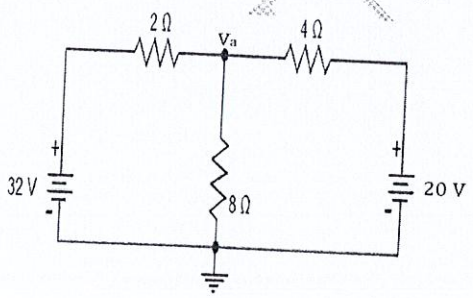

Fig. 4

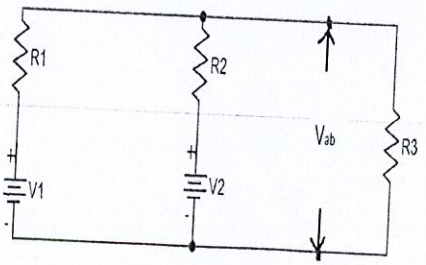

Fig. 5

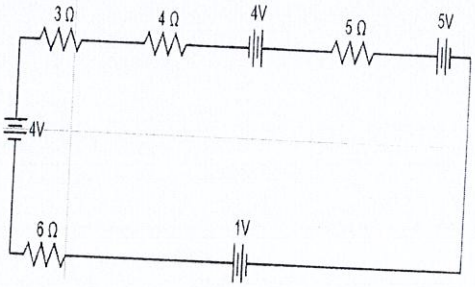

Fig. 6

(c) Find the nodal voltage V_a in the circuit shown in Fig. 4. (1)

Q3 (a) If V_1=10V, V_2=15V, R_1=4Ω, and R_2=6Ω in the circuit shown in Fig. 5, find the Thevenin equivalent for the network to the left of terminal *a,b*. (2)

(b) A circuit consisting of resistance of 100Ω in parallel with a pure capacitance of 50μF is connected to a 230-V, 5-0Hz. Calculate (i) the branch currents and the supply current, (ii) the circuit phase angle, and (iii) the circuit impedance. (2)

(c) Find current I and voltage across 4Ω resistor for Fig. 6. (1)