JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- MARCH-2023

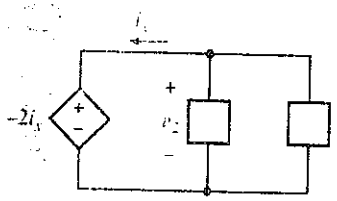
COURSE CODE (CREDITS):(4) 18B11EC212 MAX. MARKS: 15

COURSE NAME: Basic Electrical Sciences

COURSE INSTRUCTOR: Lt. Pragya Gupta MAX. TIME: 1 Hour

Note: All questions are compulsory. Marks are indicated against each question in square brackets.

Q1- (a) The dependent source in the given circuit provides a voltage whose value depends on the current i_x. What value of i_x is required for the dependent source to be supplying 1 W? **[2] CO1**

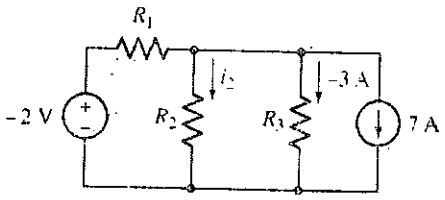


(b)A constant current of 1 ampere is measured flowing into the positive terminal of a pair of leads whose voltage we'll call V_p. Calculate the absorbed power at t = 1 sec if V_p (t) equals (i) −1 V; (ii) $4e^{-2t}$ V, (iii) Explain the significance of a negative value for absorbed power. **[3] CO1**

Q2- (a)With respect to electrical circuits explain the following terms-

(i) Circuit (ii) Node (iii) Branch (iv) Path **[2]CO1**

(b) The voltage source in the given circuit has a current of 1 A flowing out of its positive terminal into resistor R_1. Calculate the current i_2. **[3] CO1**



Q3-(a) For a parallel combination of N resistors, prove that the current through resistor R_k is-

$$i_k = i \frac{\frac{1}{R_k}}{\frac{1}{R_1} + \frac{1}{R_2} + \cdots + \frac{1}{R_N}}$$

[2] CO1

(b) For the given circuit, determine the nodal voltages v1 and v2. [3] CO1