Roll No. Enrollment No.

C U SHAH COLLEGE OF ENGINEERING & TECHNOLOGY, WADHWAN-CITY

B. E. all Semester-II Mid Semester Examination March/April 2009

Subject: Elements of Electrical Engineering

Date: 1/04/2009 Time: 03:00p.m. to 04:30p.m.

Max. Marks: 40

Instructions:

1) Attempt all questions.
2) Make suitable assumptions whenever necessary.
3) Figures to the right indicate full marks.

Q. 1 **(a)** State and explain Kirchhoff's voltage and current laws. **05**

(b) Explain and compare Series and parallel connection of resistance **04**

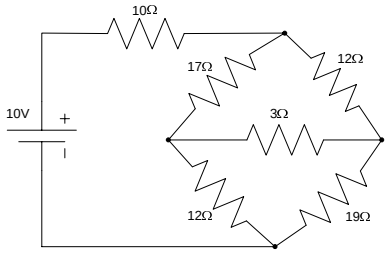
(c) Explain the effect of increase in temperature in case of (A) Metals (B) Insulators (C) Alloys **03**

Q. 2 **(a)** Define temperature co-efficient of resistance. How resistances materials vary with temperature? Prove that $\alpha_t = \alpha_0/(1+\alpha_0 t)$ **07**

(b) Draw Wheatstone's bridge network ABCD as follows: **05**
Resistance between terminals A-B, B-C, C-D, D-A and B-D are 10, 30, 15, 20 and 40 ohms respectively. A 5 volt battery of negligible resistance is connected between terminals A and C. Determine the value and direction of the current in the 40 Ω resistor.

OR

(b) For the network shown in figure, determine the current supplied by the battery using star-delta transformation.(All resistances are in ohms) **05**



Q. 3 Attempt any two **16**

(a) Define (i) RMS Value (i) form factor (ii) peak factor. Obtain the **rms** value and average value of half wave rectified sinusoidal voltage wave.

(b) Explain the method of transforming a star network of resistances into delta network and vice versa.

(c) Define following terms:
(A) Active elements (B) Passive elements (C) Circuits (D) Network (E) Branch