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[3661]-103

F. E. (Semester - I) Examination - 2009

BASIC ELECTRICAL ENGINEERING

(June 2008 Pattern)

Time : 3 Hours]

[Max. Marks : 100

SECTION - I

- Q.1) (A) Define resistance temperature coefficient of a conducting material and state its unit. Discuss the effect of temperature on resistance temperature coefficient. [06]
- (B) A copper coil when connected to a 40 Volt supply, initially takes current of 4 Amp and has a mean temperature of 20°C. After sometime, the current flowing in the coil fall to 3.90 Amp, supply voltage remain same. The mean temperature of coil is then 34°C. Determine the temperature coefficient of resistance of 0°C and 20°C. [06]
- (C) Distinguish between Primary and Secondary Cells. What are the indications which confirm that a lead acidic cell is fully charged ? [06]

OR

- Q.2) (A) A single core insulated cable of length L m has its conductor diameter d m and the thickness of insulation surrounding the conductor is t m. Derive the expression for its insulation resistance, if the resistivity of the insulating material is  $\rho$  ohm - m. [06]
- (B) A bucket contains 20 liters of water at 20°C. A 2.5 KW immersion heater is used to raise the temperature of water to 95°C. The overall efficiency of process is 90% and the specific heat capacity of water is 4200 J/KG°K. Find the time require for the process. Also find cost of energy (electricity bill) for 365 days if rate of energy is Rs. 3 per unit. [06]

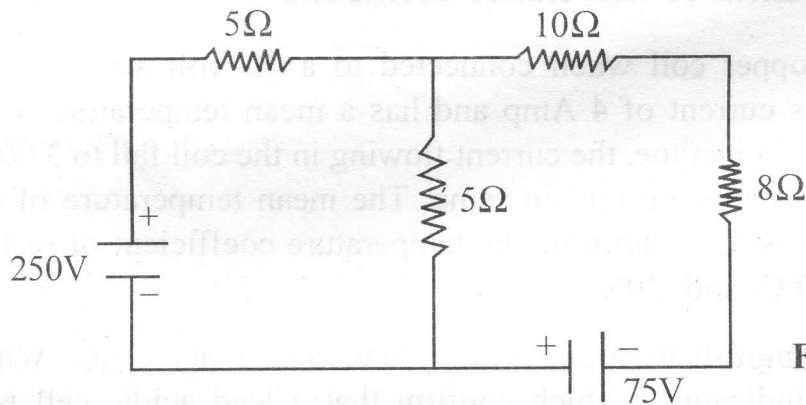


- (C) If four cells, each rated for 2V, 0.15A can be connected as a batteries in three different ways. Find voltage and current rating of each type. [06]

**Q.3) (A)** Explain the following terms with reference to d.c. resistive networks : [06]

- (1) Unilateral and Bilateral Networks
- (2) Linear and Non-linear Networks
- (3) Active and Passive Networks

(B) Using Thevenin's Theorem find the current flowing through 8 ohm resistance for the network shown in fig. 1 : [10]

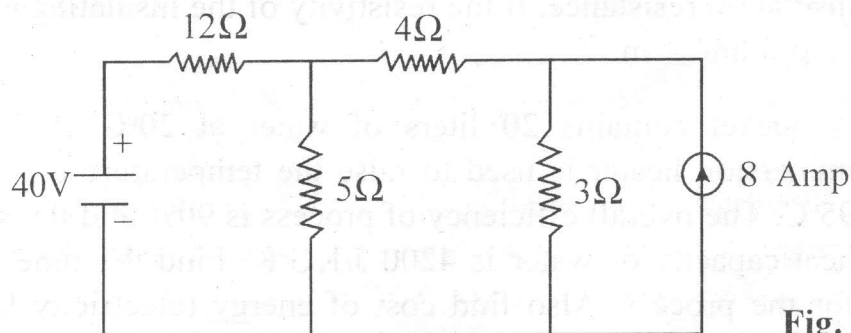


**Fig. 1**

**OR**

**Q.4) (A)** Define Star and Delta Network, hence derive an expression to convert star connected network into its equivalent delta network. [08]

(B) Using Superposition Theorem find the current flowing through 4 Ohm resistance for the network shown in fig. 2. [08]



**Fig. 2**

