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**B.Tech. Mechanical Engg. (BTMEVI) / B.Tech  
Electrical Engg (BTELVI) / B.Tech Computer  
Science & Engg (BTCSEVI) / B.Tech Civil Engg  
(BTCLEVI) / B.Tech. Electronics and  
Communication Engg. (BTECVI)**

**Term-End Examination**

**June, 2011**

**BICE-001 : ELEMENTS OF ENGINEERING  
SCIENCE**

*Time : 3 hours*

*Maximum Marks : 70*

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**Note :** *There are seven questions. Attempt any five questions  
and all questions carry equal marks.*

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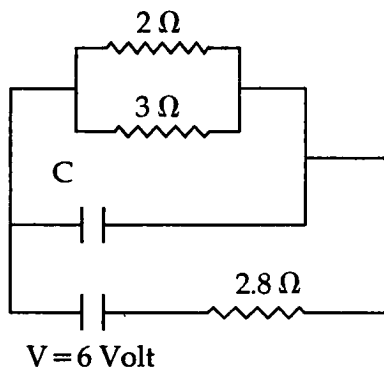
**1. Attempt any two parts : 7x2=14**

- (a) How is energy related to power ? Write SI units of work, power and energy. What are the practical units of electrical energy and mechanical power ?
- (b) Explain Ohm's Law and its limitations ? How can resistivity be expressed in Ohm - meter ?
- (c) What do you understand by an energy Source and energy convertor ? Give two examples of each. Also explain the Kirchhoff's Laws.

2. Attempt *all* parts.

7x2

- (a) Explain the Role of Civil Engineer at different level - (i) As a consultant (ii) As a contractor (iii) As a site engineer.
- (b) Calculate the steady state current in the  $2\ \Omega$  resistors as shown in Figure 1. The internal resistance of the battery is negligible and the capacitance of the capacitor C is  $0.2\ \mu\text{f}$



V = 6 Volt

Figure - 1

3. Attempt *any two* parts :

7x2

- (a) Explain types of Bearings in Brief.
- (b) Define Prismatic compass with analysis.
- (c) Explain process of heat exchange in lubricated, roller bearings.

4. Attempt all parts. 7x2
- (a) Explain the following terms in thermodynamic way :-
- (i) system
  - (ii) process
  - (iii) cycle
  - (iv) point function and path function
- (b) Compare between two stroke and Four stroke S.I Engines.
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5. Attempt *all* parts : 7x2
- (a) Draw "stress - strain" diagram for brittle and ductile materials and also explain various features of it.
- (b) Give the physical interpretation of Ohm's law. Explain the effect of temperature on Resistance.
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6. Attempt *all* parts : 2x7=14
- (a) What is sheet metal forming ? List the advantages and disadvantages of sheet metal forming process and also give the various applications.
- (b) Explain the terms which are given below :-
- (i) Drilling
  - (ii) Boring
  - (iii) Counter Boring
  - (iv) Reaming

7. Write short notes on the following (*Any two*) :-

- (a) Fourier's Law of heat conduction **2x7=14**
  - (b) Drilling and Grinding machines
  - (c) Aluminium and Its alloys
  - (d) Concept of work, Power and Energy
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