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BICE-001

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

Term-End Examination

December, 2011

BICE-001 : ELEMENTS OF ENGINEERING SCIENCE

Time : 3 hours *Maximum Marks : 70*

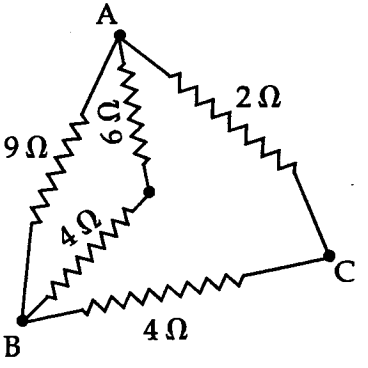
Note : *Attempt **any five** questions. Each question carry **equal** marks.*

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

(a) What do you understand by active and passive elements, unilateral and bilateral elements ? Explain with diagrams.

(b) State and explain Kirchhoff's laws. What is the difference between emf and potential difference ?

(c) A network of resistance is shown in fig. compute the equivalent network resistance measured between (i) A and B (ii) B and C



2. Attempt **all** parts : **6+8=14**

(a) Explain the following terms :

(i) Base line (ii) Tie-line

(iii) Check line

(b) Explain the role of civil engineer at different level :

(i) As a consultant

(ii) As a contractor

(iii) As a site engineer

(c) Discuss "ultimate tensile strength" of steel.

3. Attempt **all** parts : **2x7=14**

(a) Define first and second law of Thermodynamics with the help of various statements.

(b) Explain the various Thermodynamic processes with suitable examples.

4. Attempt **all** parts : **2x7=14**

(a) Explain the working of four stroke diesel engine.

(b) Give the comparison between Refrigerator, heat pump and heat engine with suitable diagrams.

5. Attempt **all** parts : **2x7=14**

(a) Define the following mechanical properties :

(i) Hardness (ii) Toughness

(iii) Creep (iv) Fatigue

(b) The properties of a closed system changes with following relation between pressure and volume as $PV = 2.8$, where 'P' is in bar and 'V' is in m^3.

Determine the work done when pressure increases from 1.4 bar to 7 bar.

6. Attempt **all** parts : **2x7=14**

(a) What is Lathe Machine ? Why it is called universal lathe ? Give the briefly explanation of various lathe operations.

(b) Draw stress - strain diagram for Brittle and ductile material with explanation of various salient points.

7. Write short notes on the following ***any two*** : **2x7=14**

(a) Newton's Law of Cooling

(b) Shaper and Planer

(c) Copper and Its Alloys

(d) Steel and Plain Carbon Steel

(e) Non Ferrous Materials