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, 2014

00635

BICE-001 : ELEMENTS OF ENGINEERING SCIENCE

Time : 3 hours   *Maximum Marks : 70*

Note : *Answer any* **five** *questions. All questions carry*
equal marks.

1. (a)   Define the term current and define unit of
          current.   5

    (b)   Distinguish   between   the   potential
          difference and the potential gradient.   5

    (c)   A 100 Ω resistor is needed in an electrical
          circuit to carry a current of 0·3 A. The
          following   resistors   are   available   from
          stock :   4

          100 Ω 5 W
          100 Ω 7·5 W
          100 Ω 10 W

          Which resistor would you select ?

2. (a) Explain the mechanical method and then graphical method of solution for three-point-problem. 7

(b) Discuss the permanent adjustment of theodolite. 7

3. Answer any *two* of the following :

(a) Explain the working of two stroke petrol engine. 7

(b) What is meant by thermodynamic equilibrium ? How does it differ from thermal equilibrium ? 7

(c) Hot air at 150° C flows over a flat plate maintained at 50° C. The forced convection heat transfer coefficient is 75 W/m^{2}K. Calculate the heat gain rate by the plate through an area of 2 m^2. 7

4. (a) Explain the non-equilibrium and quasi-static process. Is the quasi-static process a reversible process ? 7

(b) Explain Fourier's law of heat conduction. 7

5. (a) Explain clearly the different types of stresses and strains. 7

(b) Distinguish between "Soft solder" and "Hard solder".

6. (a) What is the difference between rough grinding and precision grinding ? 7

(b) Sketch and explain radial drilling machine. 7

7. Write short notes on any *four* of the following :

$$4 \times 3\frac{1}{2} = 14$$

(a) Principle of Surveying

(b) Plaster of Paris

(c) Abrasives

(d) Surveyor's Compass

(e) Closed system of thermodynamics