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BICE-001

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

June, 2018

00043

BICE-001 : ELEMENTS OF ENGINEERING SCIENCE

Time : 3 hours *Maximum Marks : 70*

Note : *Answer any* ***seven*** *questions. Draw suitable diagrams wherever necessary. All questions carry equal marks. Use of scientific calculator in allowed.*

1. (a) Explain Ohm's law and discuss the effect of temperature on resistance. *5*

(b) Find the resistance of a round copper conductor having a length of one metre and a uniform cross-sectional area of 1 cm^2. The resistivity of copper is $1{\cdot}724 \times 10^{-8}\ \Omega$ m. *5*

2. (a) Find the equivalent resistance when four resistors with resistances R_1, R_2, R_3 and R_4 are connected in series and in parallel. *5*

(b) Explain KVL and KCL. *5*

3. (a) Explain different areas of Civil Engineering. *5*

(b) Explain different types of buildings and their components. *5*

4. (a) Explain the term Ranging in Civil Engineering Survey. Draw the sketch for a line ranger. *5*

(b) Explain the graduations of a prismatic compass with a neat sketch. *5*

5. (a) Write the statements of first and second laws of thermodynamics. *5*

(b) Write the differences between two-stroke and four-stroke IC engines. *5*

6. (a) Give the equation of state for a perfect gas. *3*

(b) Explain the Carnot cycle for heat engine with a neat sketch of Carnot engine cycle and Carnot heat pump cycle. *7*

7. Write a detailed note on different types of bearings and meridians. *10*

8. Explain the terms stress and strain. Discuss their types. What is Hooke's law ? Draw stress-strain diagram for ductile materials. *10*

9. (a) Distinguish between "Soft solder" and "Hard solder". *5*

   (b) Write the composition and mechanical properties of low carbon steel, medium carbon steel and high carbon steel. *5*

10. Write short notes on any ***four*** of the following : $4 \times 2\frac{1}{2} = 10$

    (a) Lime

    (b) Stefan Boltzmann's Law

    (c) Base Line

    (d) Grinding M/c

    (e) Plasticity

    (f) Non Ferrous Alloys