DIPLOMA IN CIVIL/ELECTRICAL/ MECHANICAL ENGINEERING

Term-End Examination 01299

June, 2012

BME-050 : ENGINEERING MATERIALS

Time : 2 Hours *Maximum Marks : 70*

*Note : **Question No. 1** is **compulsory**. Attempt **any four** more questions out of the remaining questions numbered 2 to 6. Use of calculator is **permitted**.*

1. Select the correct answer from the given alternatives for each part given below. **14x1=14**

(a) An associated property by virtue of which sheets can be rolled from material is termed as _____ .

(i) Malleability (ii) Ductility

(iii) Toughness (iv) Elasticity

(b) Energy in a stretched wire is :

(i) $\frac{1}{2} \times \text{load} \times \text{extension}$

(ii) Load × strain

(iii) stress × strain

(iv) $\frac{1}{2} \times \text{stress} \times \text{strain}$

(h) _____ contains large amounts of Iron carbide which make them hard and brittle.

(i) Grey cast iron

(ii) Ductile cast iron

(iii) Malleable cast iron

(iv) White cast iron

(i) A material that has a relatively high melting temperature is _____ .

(i) Cement (ii) Concrete

(iii) Refractory (iv) Ceramic

(j) The commonly used abrasive material in the abrasive machining.

(i) Diamond

(ii) Silicon Carbide

(iii) Aluminium oxide

(iv) All of the above.

(k) _____ process improves the wear resistance by diffusion of some element in to the surface layers.

(i) Carburizing

(ii) Nitriding

(iii) Siliconizing

(iv) All of the above

(l) When _____ is dispersed in oil, it is called "oildog."

(i) Graphite

(ii) Synthetic

(iii) Nitrite

(iv) None of the above

(m) Galvanized sheets and pipes, etc. are protected against _____ .

(i) Wear resistance

(ii) Corrosion resistant

(iii) Both

(iv) None of the above

(n) Shearing stress produces a change in _____ .

(i) Area (ii) Volume

(iii) Shape (iv) Length

2. (a) Describe the procedure for finding Reckwell hardness. **2x7=14**

(b) What do you understand by hardness ? Arrange following substances from hardest to softest. Dimond, steel, copper, gypsum, corundum, calcite.

3. (a) Distinguish between an elemental metal and alloy. **2x7=14**

(b) Describe the iron making process with blast furnace.

4. (a) Draw the Iron-Carbon equilibrium diagram. Explain briefly. **2x7=14**

(b) What is mastensite and how is it formed ? Explain using unit cell structure.

5. (a) List refractory materials. Discuss properties of refractory materials. **2x7=14**

(b) Describe different types of adhesives and their properties.

6. (a) What are the functions of cutting fluids ? Why oil-water emulsions are used as cutting fluids ? **2x7=14**

(b) List the chemical cleaning processes. Explain any one of the chemical cleaning processes.