DIPLOMA IN MECHANICAL ENGINEERING (DME) DMEVI

Term-End Examination   02838

December, 2012

BME-050 : ENGINEERING MATERIALS

Time : 2 Hours   *Maximum Marks : 70*

Note : (1) *Question No. 1 is compulsory.*

(2) *Assume missing data suitably if any.*

(3) *Answer any 4 from remaining 5 questions.*

(4) *Use of scientific calculator is allowed.*

1. Answer the following quesions by making correct choice. Choose the correct statement :   **14x1=14**

    (a) The stress is defined as

        (i)   Percentage load on area of cross section

        (ii) Load applied over a unit time

        (iii) Ratio of load to original area of cross section.

        (iv) Material failure due to load

    (b) The value of E (Modulus of Elasticity) for carbon steel is :

        (i) $E = 201 \times 10^3$ MPa

        (ii) $E = 210 \times 10^3$ MPa

        (iii) $E = 211 \times 10^3$ KPa

        (iv) $E = 210 \times 10^3$ KPa

BME-050   1   P.T.O.

(c) The following is a Copper Alloy

    (i) Copper wire

    (ii) Stellites

    (iii) Brass

    (iv) Pearlite

(d) Following is the Heat treatment on cast Iron

    (i) Galvanizing

    (ii) Annealing

    (iii) Electroplating

    (iv) Austonizing

(e) Abmospheric corrosion resistance of steel is increased by addition of

    (i) Cobalt

    (ii) Copper

    (iii) Chromium

    (iv) Titanium

(f) 0.1%-0.8% of carbon in plain carbon -steel is useful for

    (i) Casting of cast Iron

    (ii) General Engineering purposes

    (iii) Wear resistance

    (iv) Corrosion resistance

(g) Cost of materials from Highest to Lowest

    (i) Mg-Steel-Copper-Aluminium (AL)

    (ii) Al-Mg-Copper-Steel

    (iii) Mg-Copper-Al-Steel

    (iv) Copper-Mg-Steel-Al

(h) Following is the 'ore' of Iron

    (i) Bauxite

    (ii) Hemitite

    (iii) Graphite

    (iv) Cermet

(i) The material with more hardness is

    (i) Hardened steel

    (ii) Tungsten carbide

    (iii) Silicon carbide

    (iv) Aluminium oxide

(j) Resulting product of Polymerization

    (i) Silica

    (ii) Ceramic

    (iii) Plastic

    (iv) Phosporous

(k) Anodizing is applied on

    (i) Steel

    (ii) Chromium

    (iii) Aluminium

    (iv) Zinc

(l) In ultrasonic cleaning, the frequency used is approximately

    (i) 20,000Hz

    (ii) 40,000 Hz

    (iii) 50,000 Hz

    (iv) 30,000 Hz

(m) Following is a solid lubricant

    (i) Grease

    (ii) Mica

    (iii) Graphite

    (iv) Mineral Oil

(n) Hardness measurement of a small part or over a small region is determined by

    (i) Vickers Hardness

    (ii) Knoop hardness

    (iii) Rockwell hardness

    (iv) Brinnel hardness

2. (a) Explain the process of Iron making in Blast furnace with suitable diagram. **10**

   (b) List eight appliction s of plain carbon steel. **4**

3. (a) Explain different methods of surface Treatment. **10**

   (b) Describe extreme pressure lubrication. **4**

4. (a) A steel specimen shows upper yield point at 230 MPa and lower yield at 220 MPa. If modulus of elasticity 'E' for steel is 210×10^3 MPa. Calculate modulus of resilience. **6**

   (b) Explain the following : **8**

    (i) Rockwell hardness measurement

    (ii) Brinnel hardness measurement

5. (a) Explain plastics and their applications as engineering materials. **7**

   (b) What is the difference between ceramic and refractory materials? Explain the uses of carbon and graphite in industry. **7**

6. (a) Explain Annealing and Normalizing with their advantages. **6**

   (b) Write short notes on the following with examples. **8**

   (i) Copper Alloys

   (ii) Magnesium Alloys