DIPLOMA IN MECHANICAL ENGINEERING/ ADVANCED LEVEL COURSE IN MECHANICAL ENGINEERING (DMEVI/ACMEVI)

Term-End Examination   0 1 4 0 2

December, 2011

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 **scientific** calculator is permitted.*

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

   (a)   The total deformation suffered by a specimen up to fracture divided by the original length multiplied by 100 is termed as _____ :

   (i)   Tension

   (ii)   Compression

   (iii)   Proportional limit

   (iv)   Percent elongation.

(b) The percent reduction is area of cross-section is also used as a measure of _____ .

(i) Toughness

(ii) Ductility

(iii) Yield strength

(iv) Elasticity.

(c) The _____ of a materials is understood to be its ability to absorb energy during entire elastic and plastic deformation.

(i) Toughness

(ii) Ductility

(iii) Brittleness

(iv) Elasticity

(d) A _____ specimen fails in tension along the cross - section, normal to axis.

(i) Steel   (ii) Copper

(iii) Cast iron   (iv) Brass

(e) Strain hardening is a practical method of increasing _____ .

(i) Elastic strength

(ii) Modulus of resilience

(iii) Modulus of toughness

(iv) Tensile stress

(f) The ability to undergo large plastic deformation under compression is called _____ .

(i) Ductility   (ii) Malleability

(iii) Resistivity   (iv) Elasticity

(g) The range of carbon percentage in High carbon steel is _____ .

(i) 0.10 - 0.30   (ii) 0.30 - 0.60

(iii) 0.60 - 0.90   (iv) 0.90 - 1.40

(h) The steel containing carbon percentage between 0.008 and 0.8% is called as _____ .

(i) Eutectoid

(ii) Hypoeutectoid

(iii) Hypereutectoid

(iv) None of the above.

(i) Cementite provides the strength while ferrite retains _____ of steel.

(i) Ductility   (ii) Malleability

(iii) Elasticity   (iv) Resistivity

(j) _____ are basically inorganic crystalline materials characterised by low ductility and high melting point.

(i) Wood   (ii) Plastic

(iii) Ceramic   (iv) Steel

(k) The hard and wear - resistant material that is used to wear, grind, or cut away other material is known as _____.

(i) Refractory (ii) Ceramic

(iii) Cement (iv) Abrasive

(l) _____ is a substance capable of holding materials together.

(i) Abrasive (ii) Adhesive

(iii) Cement (iv) Plastic

(m) A good lubricating oil must have a low vapour pressure and _____ freezing point.

(i) Low (ii) High

(iii) Medium (iv) Very high

(n) Jominy test is conducted for measuring :

(i) Conductivity

(ii) Hardenability

(iii) Viscosity

(iv) None of the above

2. (a) What do you mean by ductility ? Give five examples. 2x7=14

(b) What are the differences between a conventional universal testing machine and modern computer controlled testing machine ?

3. (a) Explain how Brinell hardness and Vickers hardness are similar. What is the difference between two methods ? **2x7=14**

   (b) Describe how one can find Larson - Miller parameter by performing creep rupture test.

4. (a) Distinguish between killed and semi - killed steels. **2x7=14**

   (b) Classify the steels according to the percentage of carbon content. Explain.

5. (a) What is plasticiser ? Give examples. Which property of polymer is improved by addition of plasticisers ? **2x7=14**

   (b) What is an adhesive ? Distinguish between structural and non-structural adhesives.

6. (a) Define the term lubricant and describe the functions of lubricants. **2x7=14**

   (b) Define the term coating. Explain the different purposes of coatings ?

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