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BME-050

DIPLOMA IN MECHANICAL ENGINEERING (DME)/DMEVI

Term-End Examination

00512 **December, 2016**

BME-050 : ENGINEERING MATERIALS

Time : 2 hours *Maximum Marks : 70*

Note : *Question number 1 is* ***compulsory****. Attempt any* ***four*** *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 : *14×1=14*

(a) The Knoop Hardness Number (KHN) is

(i) $\frac{Wh}{V}$

(ii) $\frac{P}{d^2C}$

(iii) $\frac{Pd^2}{C}$

(iv) $\frac{V}{Wh}$

(b) The tensile strength of Grey Cast Iron is

(i) 825 MPa

(ii) 205 MPa

(iii) 165 MPa

(iv) 100 MPa

(c) The fracture that occurs without any appreciable plastic deformation is

(i) Brittle fracture

(ii) Ductile fracture

(iii) Creep

(iv) Malleable fracture

(d) The tangent of the shear angle, that results from an applied shear load is

(i) Shear stress

(ii) Shear strain

(iii) Residual stress

(iv) True strain

(e) Which of the following materials is ***not*** used for making Drills, Taps, Knives, etc. ?

(i) High carbon steel

(ii) Mild steel

(iii) Tool steel

(iv) H.S. steel

(f) The steels which contain carbon between 0·25% and 0·55% are

(i) Low carbon steel

(ii) Mild steel

(iii) Medium carbon steel

(iv) High carbon steel

(g) The tensile strength of pure iron is around (in N/mm^2)

(i) 350

(ii) 300

(iii) 250

(iv) 200

(h) The more convenient laboratory test for hardenability is

(i) Jominy Test

(ii) Cylinder Series Test

(iii) Charpy Test

(iv) Izod Test

(i) Annealing is done by heating ferritic steel to a temperature of

(i) 770°C

(ii) 870°C

(iii) 970°C

(iv) 1070°C

(j) Aluminium alloy has/is

(i) High density

(ii) Low density

(iii) Toxic

(iv) Poor electrical conductivity

(k) The alloy of Tin, Copper, Lead and Antimony is

(i) Bronze

(ii) Babbit

(iii) Brass

(iv) Monel metal

(l) A mixture of particles of Cementite (Fe_3C) in a Ferrite matrix is

(i) Bainite

(ii) Martensite

(iii) Spheroidite

(iv) Pearlite

(m) A gas used in the manufacture of synthetic rubber is

(i) Hydrogen

(ii) Butadiene

(iii) Nitrogen

(iv) Beryllium

(n) Diffusion of silicon into solid metal, usually steel, at an elevated temperature is

(i) Nitriding

(ii) Siliconizing

(iii) Silicon diffusion

(iv) Anodizing

2. (a) Explain Universal Testing Machine with diagram.

(b) How does strain rate influence Yield strength, Ultimate tensile strength and Percent elongation ? *2×7=14*

3. (a) Describe Induction Type Electric Furnace with diagram.

(b) What are the applications of Low, Medium and High carbon steels ? *2×7=14*

4. (a) What is martensite and how is it formed ?

(b) Explain the process of 'Normalising'. *2×7=14*

5. (a) How is the cast iron classified ?

(b) Write the applications of magnesium and its alloys. *2×7=14*

6. Write short notes on the following : *2×7=14*

(a) Natural Polymers

(b) Adhesive Bonding