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BIME-024

DIPLOMA – VIEP – MECHANICAL ENGINEERING (DMEVI)

Term-End Examination

01245

December, 2014

BIME-024 : ENGINEERING METALLURGY

Time : 2 hours *Maximum Marks : 70*

Note : *Attempt any* ***five*** *questions. All questions carry equal marks.*

1. (a) Describe the arrangement of atoms in FCC and HCP unit cells. 7

(b) Define resolved and critically resolved shear stress. Specify their significance in brief. 7

2. (a) What steps are followed to prepare a sample for micro-structure study ? List them in their logical order. 7

(b) Define and explain the eutectic and eutectoid reactions in an Iron Carbon system. 7

3. (a) How would you classify Plain Carbon Steels ? Discuss in brief. Highlight the applications of steels in each category. 7

(b) Distinguish between Plain Carbon Steels and Cast Irons. 7

4. (a) Make a general comparison between Brasses and Bronzes. 7

(b) Make a characteristic time-temperature transformation diagram for steels. Mark on it (i) Annealing (ii) Normalising and (iii) Hardening. 7

5. (a) Based on their chemical nature, how are refractory materials classified ? Describe and give applications of each category. 7

(b) Tungsten Carbide with Cobalt as binder is used to make metal cutting tool shanks. Discuss the process which is suitable for this purpose. 7

6. (a) Explain the magnetic particle testing process in detail. Give its applications. 7

(b) Discuss the dye penetrant test in detail. Give its applications. 7

7. Write short notes on any ***four*** of the following :

$4 \times 3\frac{1}{2} = 14$

(a) Effect of W, Mn, V, Co, Si on properties of steels

(b) Babbits

(c) Manufacture of powder from ductile and brittle materials

(d) Shape memory alloy

(e) Inspection of welds by radiography
