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BIME-024

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DIPLOMA - VIEP MECHANICAL ENGINEERING (DMEVI)

Term-End Examination

June, 2013

BIME-024 : ENGINEERING METALLURGY

Time : 2 Hours *Maximum Marks : 70*

Note : *Question No. 1 is compulsory. Answer* ***any four*** *questions from question No. 2 to 8.*

1. Choose the best answer for the following : **7x2=14**

(a) Cold working is the process associated with :

(i) Working below recrystallisation temp

(ii) Above the melting point the work is done

(iii) Worked at all temperatures

(iv) Working at sub - zero temperature

(b) The direction vector and the plane having same designation are :

(i) Parallel to each other

(ii) Inclined at 60° to each other

(iii) Inclined at 45° to each other

(iv) Perpendicular to each other

(c) Pearlite structure consists of :

(i) Ferrite and cementite

(ii) Cementite and austenite

(iii) Tnoosite

(iv) Sonbite

(d) 18 - 4 - 1 high speed steel contains.

(i) 18% carbon; 4% sulphur; 1% Aluminium.

(ii) 18% vanadium 4% Tungsten, 1% chromium

(iii) 18% Tungsten 4% chromium, 1% Vanadium

(iv) 18% chromium, 4% vanadium; 1% Tungsten,

(e) Micro structure obtained after hardening process is :

(i) Mortensite

(ii) Cementite

(iii) Sorbite

(iv) Troosite

(f) Brass comprises of :

(i) Aluminium and Copper

(ii) Copper and Tin

(iii) Tin and Copper

(iv) Zinc and Copper

(g) Process annealing is performed on steels :

(i) To restore the ductility of the material

(ii) Increase hardness of the material

(iii) Increase Brittleness of the material

(iv) None of the above

2. (a) Explain the indexing of planes and directions of a cubic crystal. 7

(b) Write a brief note on imperfections in crystals. 7

3. (a) Explain the utility of Iron - Iron carbide equilibrium diagram with a suitable sketch. 7

(b) Write a detailed note on Alloy cast iron emphasising the properties, composition and application. 7

4. (a) Write the composition, properties and application of Brasses. 7

(b) Briefly define eutectic and eutectoid points in respect of Fe - C diagram. 7

5. (a) Distinguish between Hot working and cold working. Mention practical applications of both the processes. 7

(b) Explain TTT diagram and its utility in Industry. 7

6. (a) Write a brief note an Annealing and Normalising of steels with suitable sketch. 7

(b) Explain the induction hardening method and its industrial application. 7

7. (a) Write the procedure of manufacturing self lubricating bearings. 7

(b) Enlist the advantages and limitations of Non Destructive Testing methods. 7

8. Write a brief note on ***any two*** of the following : **2x7=14**

(a) Hardening and tempering

(b) Deformation of single and poly crystalline material

(c) Gray and Malleable cast iron

(d) Carburising and Nitriding.