No. of Printed Pages : 4

BIME-024

DIPLOMA – VIEP – MECHANICAL ENGINEERING (DMEVI)

Term-End Examination

00116

June, 2016

BIME-024 : ENGINEERING METALLURGY

Time : 2 hours *Maximum Marks : 70*

Note : *Attempt **five** questions in all. Question no. 1 is **compulsory**. All questions carry equal marks.*

1. Choose the correct answer from the given four alternatives. *7×2=14*

(a) The purpose of annealing is to

(i) induce hardness

(ii) induce stresses

(iii) harden the surface

(iv) remove stresses

(b) Malleability of a material is defined as

(i) Ability to withstand compressive stresses.

(ii) Ability to withstand deformation under shear.

(iii) Ability to undergo large permanent deformation in compression.

(iv) The property by which a material can be cold worked.

(c) Pig iron is

(i) The product of the blast furnace and is made by the reduction of iron-ore.

(ii) An open hearth iron very low in carbon, manganese and impurities.

(iii) An alloy in which carbon percentage is low.

(iv) An alloy containing carbon in free form.

(d) The main alloying element for corrosion resistance in stainless steel is

(i) Carbon

(ii) Manganese

(iii) Chromium

(iv) Cobalt

(e) German silver is an alloy of

(i) Nickel, copper and zinc

(ii) Silver, copper and nickel

(iii) Silver, copper and lead

(iv) Silver, gold and platinum

(f) Which of the following is an amorphous material ?

(i) Zinc

(ii) Lead

(iii) Silver

(iv) Glass

(g) Which of the following is preferred for heavy duty bearings ?

(i) Brass

(ii) White metal

(iii) Carbon chrome steel

(iv) Cast-iron

2. (a) State how the properties of alloy steels are affected by the following alloying elements :

(i) Manganese

(ii) Chromium

(iii) Tungsten

(b) List any two commonly used non-ferrous alloys stating their composition and application. *7+7*

3. (a) Give the composition of two copper based alloys and their applications.

(b) Distinguish between Cementite and Martensite. *7+7*

4. (a) Explain why tempering follows the quenching process in the heat treatment of steel.

(b) Briefly describe the following processes :

(i) Carburising

(ii) Nitriding *7+7*

5. (a) Explain briefly what do you understand about the TTT curves.

(b) How are bearing alloys classified ? Explain briefly the applications of bearing bronze. *7+7*

6. (a) How is wrought iron made ? Explain.

(b) What is meant by 'powder metallurgy' ? Describe briefly the methods by which powders suitable for powder metallurgy can be produced. *7+7*

7. (a) List and discuss the advantages and limitations of powder metallurgy process.

(b) Suggest one suitable material for each of the following purposes with justification :

(i) File cabinet

(ii) Water tap

(iii) Water pipe

(iv) Manhole cover

(v) Glass cutter

(vi) Chisel

(vii) Hammer *7+7*

8. (a) State whether the following statements are *True(T)* or *False(F)* :

(i) Brinell test is done to assess the hardness of a metal.

(ii) Radiography can be done using X-rays or γ-rays (both).

(iii) Radiography is a cheaper NDT process.

(iv) Surface roughness assessment uses a capacitance probe.

(v) Magnetic particle inspection can be done on ferromagnetic materials only.

(b) List down some non-destructive testing, and their fields of application. *10+4*
