BIME-005

B.Tech. MECHANICAL ENGINEERING (BTMEVI)

01585

Term-End Examination

June, 2012

BIME-005 : MATERIAL SCIENCE

Time : 3 Hours *Maximum Marks : 70*

Note : *(i)* *All the questions are to be answered in English language only.*

(ii) *Attempt* **any seven** *questions.*

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1. (a) What are Miller Indices ? How are they determined ? **5**

    (b) Zinc has HCP structure. The height of the unit cell is 0.494 mm. The nearest neighbour distance is 0.27 mm. The atomic weight of Zinc is 65.37. Calculate : **5**

    (i) The Volume of the unit cell.

    (ii) The density of zinc.

2. What is NDT ? For what purpose is it used ? Give the names of different types of NDT techniques and explain any two of them. **10**

3. Draw the Iron - Carbon equilibrium diagram and label the phase fields. Discuss in brief the different reactions that take place in the system. **10**

4. Define 'deformation' of engineering materials. **10**
How are they classified ? Also define engineering
stress and true stress.

5. Explain the working of Cupola Furnace with the **10**
help of neat sketch.

6. What is a TTT diagram ? Explain with the help of **10**
a sketch.

7. Explain magnetic hysteresis curve. Why is it **10**
called hysteresis curve ? Discuss coercive force
and retentivity with the help of a B- H curve.

8. What is Brass ? Describe composition, properties **10**
and application of following types of brass:
Cu - Zn brass, cartridge brass, muntz metal.

9. What are different types of ceramics ? Name any **10**
five ceramics and write their properties and
applications.

10. Write short note on *any two* of the following : **2x5=10**
   (a) Annealing
   (b) Super conductivity
   (c) Fibrous composites.