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BIME-005

B.Tech. – VIEP – MECHANICAL ENGINEERING (BTMEVI)

00418

Term-End Examination

June, 2016

BIME-005 : MATERIAL SCIENCE

Time : 3 hours *Maximum Marks : 70*

Note : *All the questions are to be answered in English language only. Attempt any* ***seven*** *questions. All questions carry equal marks.*

1. What do you understand by atomic models ? Name them and explain in detail Rutherford's nuclear atomic model. *10*

2. What is atomic packing factor ? Calculate the atomic packing factor for Hexagonal closed packed and Face centred cube crystal system. *10*

3. What is creep ? Draw a typical creep curve and explain the different stages of creep. Discuss the effect of grain size on creep strength. *10*

4. Draw the Fe – C phase diagram. Label all the phases and temperature properly. Describe the phase changes during solidification of Fe – 0·45% alloy. *10*

5. Define Carburising. Describe in brief the various carburisation processes. *10*

6. With the help of a neat sketch, explain the working of blast furnance. Also state the function of limestone added to charge. *10*

7. Differentiate between ceramics and glass. What is the glass transition temperature ? What are the different types of glasses ? Explain in brief. *10*

8. Distinguish between the structure and properties of thermosetting and thermoplastic resins. Also differentiate between addition and condensation polymerization. *10*

9. Name the different methods of Hardness testing of a plane carbon steel specimen. Explain Brinell's hardness test in detail. *10*

10. Write short notes on any ***two*** of the following : *2×5=10*

(a) Edge and Screw Dislocation

(b) Bauschinger Effect

(c) Miller Indices