

Enrollment No: _____ Exam Seat No: _____

C.U.SHAH UNIVERSITY

Summer Examination-2017

Subject Name : Material Technology

Subject Code : 4TE03MTE1

Branch: B.Tech (Automobile, Mechanical)

Semester : 3

Date : 03/04/2017

Time : 10:30 To 01:30

Marks : 70

Instructions:

- (1) Instructions written on main answer book are strictly to be obeyed.
 - (2) Draw neat diagrams and figures (if necessary) at right places.
 - (3) Assume suitable data if needed.
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Q-1

Attempt the following questions:

(14)

- 1) Cast Iron is
 - A) Ductile material
 - B) Malleable material
 - C) Brittle material
 - D) Tough material
- 2) The percentage of carbon in cast iron varies from
 - A) 0.1 to 0.5
 - B) 0.5 to 1
 - C) 1 to 1.7
 - D) 1.7 to 4.5
- 3) The ability of a material to absorb energy in the plastic range is called
 - A) Resilience
 - B) Creep
 - C) Fatigue strength
 - D) Toughness
- 4) Which of the following material has maximum ductility?
 - A) Mild steel
 - B) Copper
 - C) Nickel
 - D) Aluminium
- 5) An eutectoid steel consists of
 - A) wholly pearlite
 - B) wholly austenite
 - C) pearlite and ferrite
 - D) pearlite and cementite
- 6) Closed packed hexagonal space lattice is found in
 - A) Zn, Mn, Co, Cd, Bi
 - B) Iron, Al, Cu, Pb, Ag
 - C) W, Cr, Mo, Alpha-iron
 - D) none of the above



- 7) Number of atoms per unit cell for SC, BCC and HCP are
 A) 1,2,4
 B) 1,2,3
 C) 1,4,6
 D) 1,4,8
- 8) The hardness is the property of a material due to which it
 A) can be drawn into wires
 B) breaks with little permanent distortion
 C) can cut another metal
 D) can be rolled or hammered into thin sheets
- 9) Which statement suits to cast iron from the following?
 A) High strength
 B) High ductility
 C) High tensile strength
 D) None of above
- 10) The full name of TTT diagram is
 A) Time Transformation Temperature
 B) Time Temperature Transformation
 C) Time Turning Temperature
 D) Temperature Time Transformation
- 11) Which of these is not related to hardness of materials?
 A) Jominy End quench
 B) Wicker's Hardness test
 C) Ultimate Tensile Test
 D) Grossmann Method
- 12) Which of the following is not powder production method?
 A) Atomisation
 B) Milling
 C) Crushing
 D) Shaping
- 13) Magnetic particle test is not used for
 A) Mild steel
 B) Staines less steels
 C) Hard steels
 D) Copper
- 14) Cooling diagram is drawn using what variables from the following?
 A) Temperature – Time
 B) Temperature - Transformation
 C) Time - Transformation
 D) Transformation – Composition

Attempt any four questions from Q-2 to Q-8

- Q-2** (a) Draw a neat and labeled sketch of Iron Carbon equilibrium diagram and explain the solidification of 0.4 % carbon steel. **7**
- (b) Write a short note on dislocation theories. **7**
- Q-3** (a) Give the characteristics of White Cast Iron. **7**
- (b) What do you mean by the term Gun metal? Give important features and application **7**



of the same.

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| Q-4 | (a) | Write a short note on Engineering requirements of the materials. | 5 |
| | (b) | Discuss the Ionic bonds in metallic materials. | 5 |
| | (c) | Define the terms : Atomic mass and Atomic number | 4 |
| Q-5 | (a) | Draw a neat sketch of FCC unit cell, show the relation of axis and angles and give two examples for the same. | 5 |
| | (b) | Compare Annealing and Normalizing processes. | 5 |
| | (c) | Discuss the Frank reed source of dislocation. | 4 |
| Q-6 | (a) | Write a short note on Ultrasonic test. | 7 |
| | (b) | What are the limitations of Grossmann method? Discuss the Jominy end quench test. | 7 |
| Q-7 | (a) | Explain with neat sketch and effect of different cooling rates using TTT diagram. | 7 |
| | (b) | Write a short note on Cd – Bi equilibrium diagram. | 7 |
| Q-8 | (a) | Discuss with neat sketch the Atomization process for the production powder. | 7 |
| | (b) | Give limitations of powder metallurgical processes. | 7 |

