

Enrollment No: _____

Exam Seat No: _____

C.U.SHAH UNIVERSITY

Summer Examination-2020

Subject Name : Material Technology

Subject Code: 4TE03MTE1

Branch: B.Tech (Mechanical)

Semester : 3 Date: 07/03/2020

Time : 02:30 To 05:30

Marks : 70

Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
- (2) Instructions written on main answer book are strictly to be obeyed.
- (3) Draw neat diagrams and figures (if necessary) at right places.
- (4) Assume suitable data if needed.

Q-1 Answer the following questions.

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| (a) Define the term: Yield Strength | 02 |
| (b) Draw neat and labeled Stress strain diagram for ductile materials. | 02 |
| (c) Draw the perlite and Austenitic phases of steel. | 02 |
| (d) Eutectoid steel contains _____ % of carbon. | 01 |
| (e) Draw the Schottky defect. | 01 |
| (f) Give the name of any two secondary Powder Metallurgical process. | 01 |
| (g) Draw line sketch of edge dislocation. | 01 |
| (h) Draw HCP structure and write the full form of HCP. | 01 |
| (i) Give the full name of BCT. | 01 |
| (j) Draw cooling diagram for pure metal. | 01 |
| (k) Write any two metal powder characteristics need to be checked. | 01 |

Attempt any four question from Q-2 to Q-8:

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| Q-2 (a) Draw a neat and labeled sketch of Iron Carbon equilibrium diagram and explain the solidification of 0.4 % carbon steel. | 07 |
| (b) Draw the structure of and calculate the number of atoms per unit cell for B. C. C and F. C. C structures. | 07 |
| Q-3 (a) Discuss with neat sketch the TTT diagram. | 07 |
| (b) Write a short note on Isomorphous type of equilibrium diagram. | 07 |
| Q-4 (a) Give the characteristics of White Cast Iron. | 05 |
| (b) What do you mean by the term Bearing metal? Give the features and application of the same. | 05 |
| (c) Compare and differentiate Annealing and Normalizing processes. | 04 |
| Q-5 (a) Write a short note on Spheroidise cast iron. | 05 |
| (b) Write a short note Frank Reed source of dislocation. | 05 |
| (c) What are the factors governing solid solution formation. | 04 |
| Q-6 (a) Discuss the steps of quenching of steel in detail. | 05 |
| (b) Give the details of Liquid carburizing process. | 05 |
| (c) Explain Dye Penetrate test by stating its major application. | 04 |
| Q-7 (a) Discuss the advantages and limitations of normalizing treatment. | 05 |
| (b) Write a short note on Jominy end quench test showing all necessary figures. | 05 |
| (c) Write a short note on radiography method for NDT. | 04 |



- Q-8 (a) How does the metal powder characterization can be done in PM processes? 04
(b) Give a broad classification of engineering materials. 05
(c) Discuss the sintering process with neat sketch. 05

