

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-VI (NEW) EXAMINATION – WINTER 2024

Subject Code:3162110

Date:25-11-2024

Subject Name:Materials Processing

Time:02:30 PM TO 05:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) What are the key characteristics of cold working in metal forming? **03**
(b) How does plastic deformation occur in metals during forming? **04**
Explain the concept of yield strength.
(c) What is rolling process? Explain any two rolling mills in detail. **07**

- Q.2** (a) Name at least six components that are manufactured by casting processes. **03**
(b) Draw and explain components of a wire drawing die. **04**
(c) Explain indirect extrusion process in detail. **07**

OR

- (c) Describe the stages of dynamic recrystallization during metal forming, and discuss its effects on grain structure and material properties. **07**

- Q.3** (a) Write advantages and limitation of SMAW process. **03**
(b) Justify accuracy of CCT diagram over TTT diagram for welds. **04**
(c) Explain concept of polarity in arc welding processes. **07**

OR

- Q.3** (a) Write principle of GTAW process? Give its advantages. **03**
(b) Draw neat sketch of different edge preparations used in welding. **04**
(c) Write a note on Plasma Arc Welding process. **07**

- Q.4** (a) Define welding and give its advantages over bolting operations. **03**
(b) Explain importance of carbon equivalent in welding industry. **04**
(c) Explain problems associated with welding of nonferrous metals and alloys. **07**

OR

- Q.4** (a) Define casting process and list various casting processes. **03**
(b) Give advantages and limitations of sand casting process. **04**
(c) Explain how a casting solidifies after pouring into the mold. **07**

- Q.5** (a) List applications of casting process. **03**
(b) Explain undercooling phenomena in casting. **04**
(c) Explain investment casting process in detail. **07**

OR

- Q.5** (a) What are the differences between ceramics and glassy materials? **03**
(b) What are the steps involved in the preparation of ceramic powders? **04**
(c) Describe the injection molding process for manufacturing ceramics and discuss its advantages and limitations. **07**
