

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2023****Subject Code:3162110****Date:06-07-2023****Subject Name:Materials Processing****Time:10:30 AM TO 01:00 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.

MARKS

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|------------|---|-----------|
| Q.1 | (a) What is the role of plasticity in metal forming process? | 03 |
| | (b) How Bulk manufacturing processes are different than sheet metal manufacturing ? | 04 |
| | (c) Critically compare cold, Warm and Hot metal Working Processes. | 07 |
| | | |
| Q.2 | (a) What is 0.2% proof stress? How it can be calculated? | 03 |
| | (b) Draw a process flow diagram to produce the plates/sheets, bar rods and structural shapes. What are the primary form of shapes out of which they are made? | 04 |
| | (c) Explain the principles of rolling and draw its only two roll configuration types. List down the process variables of the rolling process | 07 |
| OR | | |
| | (c) Discuss the changes in grain structure during rolling and process of dynamic recovery and recrystallisation. | 07 |
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| Q.3 | (a) With schematic explain deep drawing process and state about the defects. | 03 |
| | (b) State the advantages and disadvantages of forging over other metal forming processes from metallurgical point of view. | 04 |
| | (c) Draw a labeled diagram of Open Die forging Vs Closed die forging processes with example of products forged in each types. | 07 |
| OR | | |
| Q.3 | (a) With sketch describe tube drawing process with necessary tooling. | 03 |
| | (b) Explain with schematics the difference between direct extrusion and indirect extrusion process & state the typical products produced with each. | 04 |
| | (c) List only the types of defects encountered in rolling, Forging, Extrusion, Wire drawing and deep drawing processes parts and explain any ONE of them in detail with suggested remedies. | 07 |
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| Q.4 | (a) Why a study of metallurgy is necessary to understand metal working & metal joining process? | 03 |
| | (b) What is the parameter to decide the weldability of carbon steel ? | 04 |
| | (c) Explain working principle of Shielded Metal Arc welding Process with a diagram. | 07 |
| OR | | |
| Q.4 | (a) Enlist the various defects encountered in welding process & discuss any one of them with neat sketch. | 03 |
| | (b) Draw a CCT diagram of a eutectoid steel with proper label. | 04 |
| | (c) Discuss factors considered for dissimilar metal welding with suitable example. | 07 |

- Q.5** (a) Draw a flow diagram of any metal casting process. **03**
(b) Define mould, core, pattern, runner, riser and chill. **04**
(c) Differentiate between sand mold casting and investment casting process in terms of process capability, surface finish, tolerances and cost. **07**

OR

- Q.5** (a) Describe impact extrusion process with an example of component produced with this process. **03**
(b) Write a short note with schematic on directional solidification of metal casting. **04**
(c) Discuss the role of network modifiers, network formers and Network intermediates in Glass structure. **07**
