

# JHARKHAND UNIVERSITY OF TECHNOLOGY

Diploma 3rd Semester Sample Paper ( DIPLOMA WALLAH )

## MANUFACTURING PROCESS (MEC 303)

More Model Sets & Study Materials available here [DiplomaWallah.in](https://DiplomaWallah.in)

**Time: 3 Hours**

**Full Marks: 70**

**SET: 1**

### INSTRUCTIONS:

1. Question No. 1 is Compulsory.
2. Answer any **FOUR** questions from the remaining (Q.2 to Q.7).
3. Use diagrams wherever necessary to explain your answer.

### Q.1. Multiple Choice Questions

**[2 × 7 = 14]**

**(i) The draft allowance on patterns is provided to:**

- |                              |                                      |
|------------------------------|--------------------------------------|
| (a) Compensate for shrinkage | (b) Facilitate withdrawal of pattern |
| (c) Improve surface finish   | (d) Increase strength                |

**(ii) In Arc Welding, the temperature of the arc is approximately:**

- |                     |              |
|---------------------|--------------|
| (a) 1000°C          | (b) 2000°C   |
| (c) 3500°C - 4000°C | (d) 10,000°C |

**(iii) Which flame is used for welding brass and bronze?**

- |                       |                       |
|-----------------------|-----------------------|
| (a) Neutral flame     | (b) Oxidizing flame   |
| (c) Carburizing flame | (d) None of the above |

**(iv) The property of sand to permit the escape of gases is called:**

- |                  |                  |
|------------------|------------------|
| (a) Plasticity   | (b) Cohesiveness |
| (c) Permeability | (d) Adhesiveness |

**(v) Which process is used for making long continuous products like rods and tubes?**

- |               |             |
|---------------|-------------|
| (a) Forging   | (b) Rolling |
| (c) Extrusion | (d) Casting |

**(vi) In blanking operation, the piece cut out is the:**

- |           |             |
|-----------|-------------|
| (a) Scrap | (b) Product |
| (c) Waste | (d) None    |

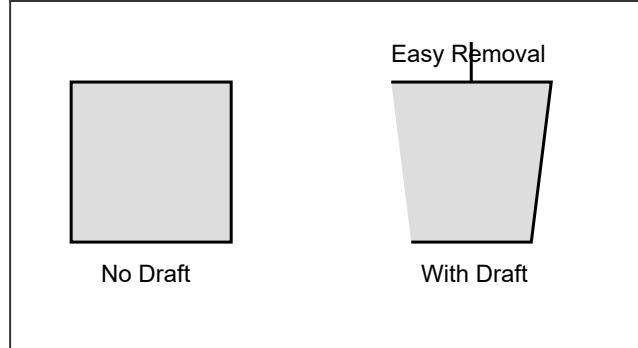
**(vii) Thermoplastics can be:**

- |                                   |                                    |
|-----------------------------------|------------------------------------|
| (a) Softened by heating only once | (b) Softened by heating repeatedly |
| (c) Cannot be softened            | (d) Are hard and brittle           |

### SECTION B (Long Answer Type)

**Q.2. (a) [Figure Based]** Explain the different **Pattern Allowances** (Shrinkage, Draft, Machining) with neat sketches. Why is the shrinkage allowance different for different metals?

**[7]**



**Q.2. (b) [Theory]** Define **Moulding Sand**. List and explain the essential **Properties of Good Moulding Sand** (Permeability, Green Strength, Refractoriness, Cohesiveness).

[7]

**Q.3. (a) [Theory]** Explain the construction and working of a **Cupola Furnace** with a neat diagram. Label the different zones (Combustion, Melting, Reducing).

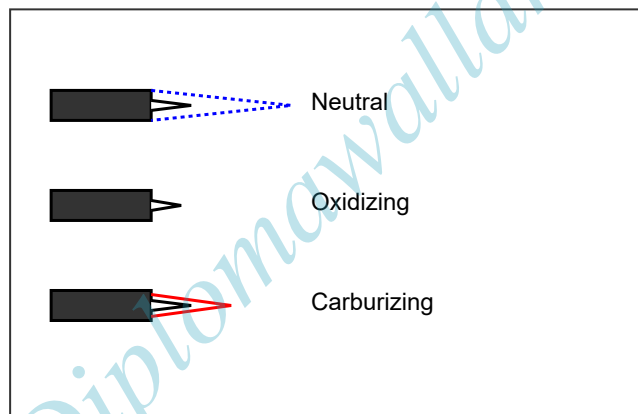
[7]

**Q.3. (b) [Theory]** Differentiate between **TIG (Tungsten Inert Gas)** and **MIG (Metal Inert Gas)** welding. Why are inert gases used?

[7]

**Q.4. (a) [Figure Based]** Explain the **Oxy-Acetylene Gas Welding** process. Describe the three types of flames (Neutral, Oxidizing, Carburizing) with diagrams.

[7]



**Q.4. (b) [Theory]** Explain the principle of **Resistance Spot Welding**. What are the parameters controlling the weld quality (Current, Time, Pressure)?

[7]

**Q.5. (a) [Theory]** Differentiate between **Hot Working** and **Cold Working** of metals. State three advantages of each.

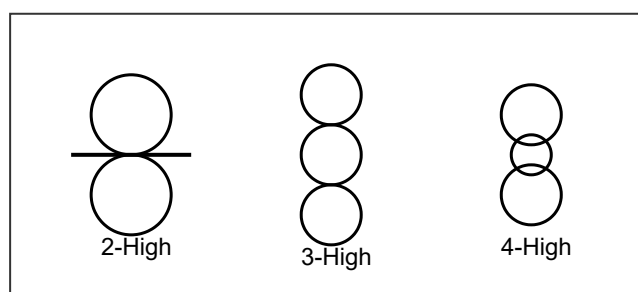
[7]

**Q.5. (b) [Theory]** Explain the process of **Drop Forging**. How does it differ from Press Forging?

[7]

**Q.6. (a) [Theory/Diagram]** Explain the **Rolling Process**. Describe the arrangement of rolls in **Two-High**, **Three-High**, and **Four-High** rolling mills with sketches.

[7]



**Q.6. (b) [Theory]** Explain the operation of **Injection Moulding** for plastics with a neat diagram. **[7]**

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**Q.7. Write Short Notes on (Any FOUR):**

**[3.5 × 4 = 14]**

- a. Casting Defects (Blow holes, Misrun)
  - b. Soldering vs Brazing
  - c. Thermit Welding
  - d. Extrusion (Direct vs Indirect)
  - e. Gating System Components
- 

### **Diploma Wallah: Solution Key**

**MCQ:** (i) b, (ii) c, (iii) b, (iv) c, (v) c, (vi) b, (vii) b.

**Q2(a) Hint:** Draft is Taper ( $1-2^\circ$ ); Shrinkage is oversize to compensate cooling contraction.

**Q4(a) Note:** Neutral (1:1), Oxidizing (More  $O_2$ ), Carburizing (More Acetylene).

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Made With  by Sangam ( **Diploma Wallah** )