

JHARKHAND UNIVERSITY OF TECHNOLOGY

Diploma 3rd Semester Sample Paper (DIPLOMA WALLAH)

MANUFACTURING PROCESS (MEC 303)

More Model Sets & Study Materials available here 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

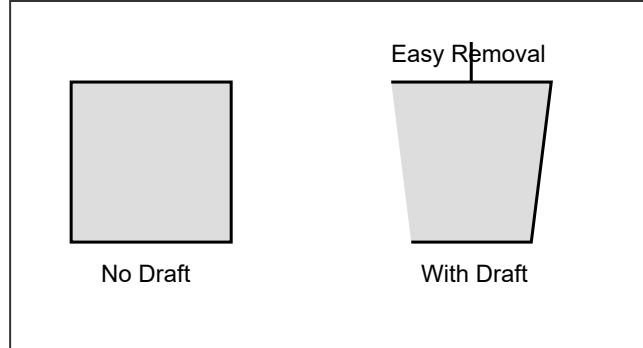
(vii) Thermoplastics can be:

(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]

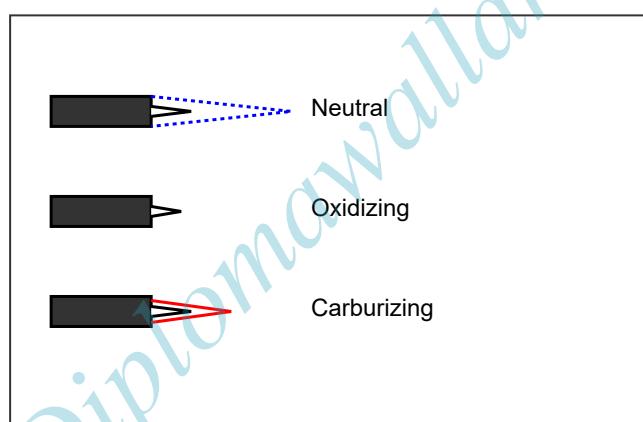


Q.2. (b) [Theory] Define **Moulding Sand**. List and explain the essential **Properties of Good Moulding Sand** (Permeability, Green Strength, Refractoriness, Cohesiveness). [7]

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]

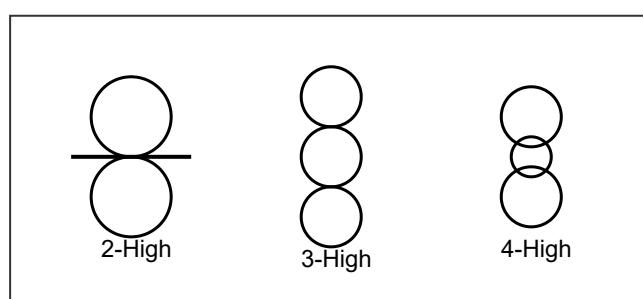


Q.4. (b) [Theory] Explain the principle of **Resistance Spot Welding**. What are the parameters controlling the weld quality (Current, Time, Pressure)? [7]

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.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°); Shrinkage is oversize to compensate cooling contraction.

Q4(a) Note: Neutral (1:1), Oxidizing (More O₂), Carburizing (More Acetylene).