

JK Lakshmipat University Jaipur
INSTITUTE OF ENGINEERING AND TECHNOLOGY

End-Term Examination, April-May 2018
B. Tech. in Mechanical Engineering, Semester IV

Roll No.....

ME405: Production Technology-I

Time: 3 hours

Max. Marks: 100

Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.
3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.

Q.1A Objective type questions (10 questions @ 1 mark)

10

- Negative allowance is provided on the pattern to take care of the
(A) Distortion allowance (B) Draft allowance (C) Machining allowance (D) Shake allowance
- ii. A primary function of a riser is to
(A) prevent atmospheric air from contaminating the metal in the mold
(B) allow gases to easily escape from mold cavity
(C) feed molten metal to casting as it solidifies
(D) allow molten metal to rise above the mold cavity
- iii. Match the following
- | Defects | Possible Causes |
|---------------|--|
| P. Hot tears | 1. Improper fusion of two streams of liquid metal |
| Q. Shrinkage | 2. low permeability of the sand mould |
| R. Blow holes | 3. Volumetric contraction both in liquid and solid stage |
| S. Cold shut | 4. Differential cooling rate |
- (A) P-1, Q-3, R-2, S-4 (B) P-4, Q-3, R-2, S-1 (C) P-3, Q-4, R-2, S-1 (D) P-1, Q-2, R-4, S-3
- iv. In oxyacetylene gas welding, temperature at the inner core of the flame is around
(A) 3500 (B) 3200 (C) 2900 (D) 2550
- v. Which of the following welding process is used for welding of sheet metals in a automobile and aircraft industries?
(A) Shielded metal arc welding (B) Tungsten inert gas welding
(C) Thermit welding (D) resistance welding
- vi. Match the correct pairs.
- | Processes | Characteristics/Applications |
|-------------------------------|--|
| P. Friction welding | 1. non – consumable electrode |
| Q. Gas metal arc welding | 2. joining of thick plates |
| R. Tungsten inert gas welding | 3. consumable electrode wire |
| S. Electroslag welding | 4. joining of cylindrical dissimilar materials |
- (A) P-4, Q-3, R-1, S-2 (B) P-4, Q-2, R-3, S-1
(C) P-2, Q-3, R-4, S-1 (D) P-2, Q-4, R-1, S-3
- vii. In which of the following type of lathe, lead screw is provided for thread cutting
(A) Center (B) Turret (C) Capston (D) all of above
- viii. The following is used in magnetic chucks
(A) Electromagnet (B) Permanent magnet (C) Both A & B (D) None of above

ix	The principle of interchangeability is normally employed for (A) Mass production (B) Production of identical parts (C) parts with prescribed limits of size (D) All of above	
x	The following is not a type of comparator (A) Electrical (B) Pneumatic (C) Optical (D) hydraulic	
Q.1B	Short answer type questions (4 questions @ 2.5 marks)	10
a.	List different types of additives used in sand moulding and mention their purpose of use	
b.	Define welding. Give broad classification of welding process.	
c.	List various drilling machines	
d.	What are the uses of Sine bar?	
Q.2A	Define manufacturing process and explain primary and secondary manufacturing process	6
Q.2B	Discuss the different materials (min. 2 materials) used in making a pattern	4
Q.3A	Explain in detail various allowances given to pattern and reasons to provide the allowances	6
Q.3B	List the types of moulding sand. Briefly explain any two properties of moulding sand	4
Q.4A	Draw a neat sketch and explain the hot chamber die casting process.	5
Q.4B	In a particular mold design, the down sprue has an area of cross section of 6.45 cm ² , where the pouring basin leads into the sprue. The sprue is 20 cm long. The required metal flow rate at top section of the sprue is 820 cm ³ /s. Determine the area of C.S. of the sprue at its bottom to avoid the aspiration of liquid molten metal.	5
OR		
Q.4B	A cylindrical riser must be designed for a sand-casting mold. The casting itself is a steel rectangular plate with dimensions 7.5 cm x 12.5 cm x 2.0 cm. Previous observations have indicated that the solidification time for this casting is 1.6 min. The cylinder for the riser will have a diameter-to-height ratio as 1.0. Determine the dimensions of the riser so that its solidification time is 2.0 min.	5
Q.5A	With neat sketch explain Oxy-acetylene welding process	6
OR		
Q.5A	Explain the principle of arc welding process	6
Q.5B	Differentiate between Soldering and Brazing. Mention their advantages	4
Q.6A	Explain different welding defects, their causes and remedies	6
Q.6B	Sketch and explain the Thermit welding process.	4
Q.7A	Write short notes on cleaning and edge preparation in welding process	
Q.7	Describe twist drill nomenclature using sketches	5
OR		
Q.7B	Draw a neat diagram of a radial drilling machine. Name and explain the parts	5
Q.8A	Differentiate between: (i) Hole basis and shaft basis system, (ii) clearance fit and interference fit	6
Q.8B	What are the advantages of optical comparator over mechanical pneumatic comparator?	4
Q.9A	Differentiate between turret lathe and capstan lathe	5
Q.9B	The heights of peaks and valleys of 20 successive points on a surface are 45, 25, 23, 22, 24, 53, 15, 22, 64, 32, 63, 12, 23, 34, 55, 23, 11, 12, 17, 15 microns respectively, measured over a length 20 mm. Determine CLA and RMS values of roughness surface.	5
OR		
Q.9B	What are the concepts of interchangeability and selective assembly? Which is advantageous?	5