

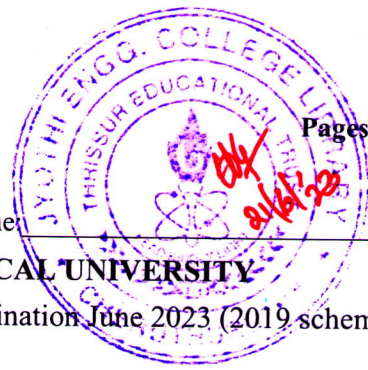
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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fourth Semester B.Tech Degree Supplementary Examination June 2023 (2019 scheme)

Course Code: MET204

Course Name: MANUFACTURING PROCESS

Max. Marks: 100

Duration: 3 Hours

PART A

(Answer all questions; each question carries 3 marks)

Marks

- | | | |
|----|---|---|
| 1 | What are different shrinkages taking place during the solidification of molten metal from pouring temperature to room temperature? How can they be compensated? | 3 |
| 2 | List any three desirable properties of pattern material used in metal casting. | 3 |
| 3 | What are the advantages of Laser Beam Welding over Electron Beam Welding? | 3 |
| 4 | What are the functions of coatings given to electrodes in arc welding? | 3 |
| 5 | What are the ways to reduce the occurrence of chatter during rolling operation? Give any three. | 3 |
| 6 | What is spreading in rolling operation? What are its causes (any 2)? | 3 |
| 7 | Give any three reasons for die failure in forging operation. | 3 |
| 8 | A round billet made of 70-30 brass is extruded at a temperature of 675°C. The billet diameter is 125 mm, and the diameter of the extrusion is 50 mm. Calculate the extrusion force. Given that for 70-30 brass, extrusion constant is 250 MPa at the given extrusion temperature. | 3 |
| 9 | List any three major processing parameters in shearing. | 3 |
| 10 | What are the basic requirements of clamping devices? | 3 |

PART B

(Answer one full question from each module, each question carries 14 marks)

Module -1

- | | | |
|----|--|---|
| 11 | a) With neat sketch, explain the role of various components of gating system in casting. | 7 |
| | b) With neat sketches, explain the role of core, core prints and chaplets in metal casting operations. | 7 |
| 12 | a) With neat sketches, explain an expendable pattern casting processes. | 8 |
| | b) With neat sketch, explain the different accessories used in gating system of casting? | 6 |

Module -2

- 13 a) With neat sketches, explain the characteristics of different types of flames used in gas welding. 9
b) Compare the characteristic features of Gas Metal Arc Welding and Metal Inert Gas Welding operation. 5
- 14 a) Define weldability. Briefly explain any 6 factors influencing weldability of engineering materials. 7
b) Compare the following characteristics when arc welding is performed using Direct Current straight polarity and Direct Current reverse polarity 7
- i. Heat generation at the base metal
 - ii. Depth of penetration
 - iii. Melting point of metals that can be welded
 - iv. Thickness of metals that can be welded
 - v. Welding speed
 - vi. Melting rate of electrode
 - vii. Heat generation at electrode

Module -3

- 15 a) With neat sketches, explain shape rolling, roll forging and tube rolling. 9
b) Comparing with metal casting, what are the advantages of plastically deforming materials to achieve final product. 5
- 16 a) With neat sketches, explain any four rolling defects. 8
b) List any three advantages and disadvantages of hot rolling operation. 6

Module -4

- 17 a) With neat sketches, compare and contrast direct and indirect extrusion processes. 10
b) What are the factors influencing the selection of die material for forging operations? 4
- 18 a) With neat sketches explain open die and closed die forging operations. 10
b) What are the factors to be incorporated to avoid tearing of sheet metal during deep drawing operation? 4

Module -5

- 19 a) Explain the four basic principles of location. 8
b) With neat diagrams briefly explain what is meant by trimming, shaving, nibbling, and notching. 6
- 20 a) With neat diagrams, explain compound die, combination die and progressive die. 9
b) List any five factors to be considered while designing for clamping. 5
