

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY  
FOURTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), MAY 2019**

**Course Code: ME220**

**Course Name: MANUFACTURING TECHNOLOGY (IE, ME, MA)**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer any three questions. Each question carries 10 marks.*

- |   |                                                                                                                                                        |   |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| 1 | a) Why casting is preferred over other methods of manufacturing? Discuss                                                                               | 3 |
|   | b) With the help of neat sketches, explain any two types of commonly used patterns                                                                     | 4 |
|   | c) Distinguish between liquid shrinkage and solid shrinkage as related to casting. How they are taken care of in designing sand casting                | 3 |
| 2 | a) Describe the complete step by step procedure of investment casting.                                                                                 | 4 |
|   | b) Explain any one type of centrifugal casting process with a neat sketch                                                                              | 4 |
|   | c) Name any eight common defects encountered in casting process                                                                                        | 2 |
| 3 | a) Sketch and explain Cluster and Planetary rolling mill arrangements used in rolling processes                                                        | 6 |
|   | b) Why is the surface finish of a rolled product better in cold rolling than in hot rolling?                                                           | 2 |
|   | c) A 400 mm thick slab is to be cold rolled. The roll diameter is 800 mm and the coefficient of friction is 0.08. Determine the maximum possible draft | 2 |
| 4 | a) With the help of a neat sketch, explain the distribution of roll pressure along the contact length in flat rolling.                                 | 4 |
|   | b) Is rolling process useful for making seamless thick-walled tubes? Explain with proper sketches.                                                     | 4 |
|   | c) How can you reduce the 'roll force' in a rolling process?                                                                                           | 2 |

**PART B**

*Answer any three questions. Each question carries 10 marks*

- |   |                                                                                                                                               |   |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------|---|
| 5 | a) What do you understand by the term 'flash' in a forging? Explain with the help of a sketch                                                 | 3 |
|   | b) With a neat diagram explain the process of direct extrusion.                                                                               | 4 |
|   | c) Explain with a neat sketch 'wire drawing' process                                                                                          | 3 |
| 6 | a) Make neat sketches and explain coining and heading                                                                                         | 4 |
|   | b) With the help of a schematic illustration, explain impact-extrusion process. What is the function of a stripper plate in impact extrusion? | 4 |

- c) Explain the difference between open and closed die forging techniques. 2
- 7 a) Explain the aspect 'Degree of freedom of movement of a free body' with special reference to location of workpieces 3
- b) What is the principle of 'Six-point location'? Explain with suitable sketches 7
- 8 a) Select a locating system to best locate the part shown in *Figure A*. 3

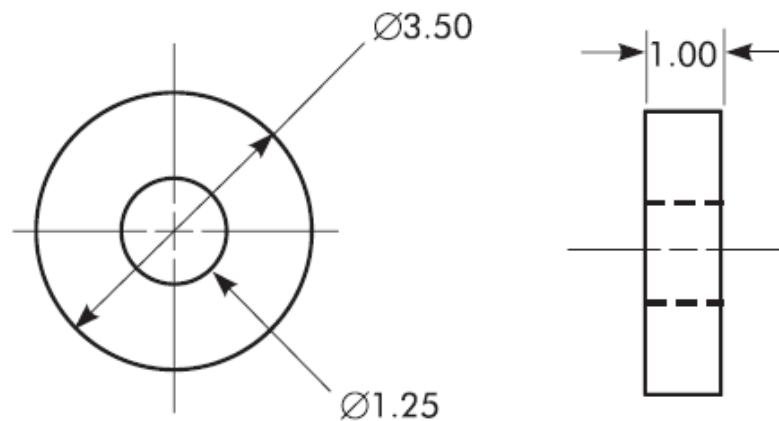


Figure A.

- b) What do you understand by foolproofing? Explain with an example 3
- c) What are the different types of strap clamp? Give sketches 4

### PART C

*Answer any four questions. Each question carries 10 marks.*

- 9 a) Describe with neat sketch the deep-drawing process. What defects can occur in an improperly deep drawn product? 5
- b) Discuss with neat sketch the working of metal spinning process 5
- 10 a) Why is it necessary to provide clearance between the punch and die in a shearing operation? Give reasons 2
- b) Write a note on "bending" of sheet metal. What is spring back and how is its effect eliminated? 5
- c) Bring out the differences between punching and blanking. 3
- 11 a) What is the Guerin process? How does the Guerin process reduce the cost of tooling in a drawing operation? 3
- b) Define heat affected zone? What is its importance in producing a crack free weld? 3
- c) What are the factors that affect weldability 4
- 12 a) Sketch the three types of gas welding flames and give differences between them. 3
- b) With a neat sketch explain the construction and working of Carbon Arc Welding 4

- c) Explain the term 'flux' or 'soldering fluid'. Enumerate the fluxes commonly used in soldering process. 3
- 13 a) What is the difference between a consumable electrode and nonconsumable electrode? For which processes does a filler metal have to be added by a separate mechanism? 3
- b) Explain the working of Resistance Spot Welding. State their advantages and limitations 7
- 14 a) Explain operation, equipment and applications of ultrasonic welding. 6
- b) Explain construction and working principle of submerged arc welding 4