

B.E./B.TECH. Degree Examination, December 2020
Third Semester
ME16302 – MANUFACTURING TECHNOLOGY - I
(Regulation 2016)

Time: Three hours

Maximum : 80 Marks

Answer **ALL** questions

PART A - (8 X 2 = 16 marks)

1. Chills used in casting process are
 1. Made of the same material as mould
 2. Made of the metallic piece
 3. Placed inside the moulding sand
 4. Placed inside the moulding cavityWhich of these statements are correct?
 - a. 1 and 3
 - b. 1 and 4
 - c. 2 and 4
 - d. 2 and 3
2. For joining of the thick plates, preferred polarity used in DC welding is
 - a. Direct current straight polarity
 - b. Direct current reverse polarity
 - c. Direct current electrode positive
 - d. All the above
3. Brittle materials can be extruded through the
 - a. Forward extrusion
 - b. Backward extrusion
 - c. Impact extrusion
 - d. Hydrostatic extrusion
4. Significant thinning and lengthening of the wall of a cup can be achieved by the process called as
 - a. Coining
 - b. Embossing
 - c. Nibbling
 - d. Ironing
5. Why draft allowance is to be provided to the pattern?
6. What type of gas flame is used for welding steels? Why?
7. Name and explain the forging related operation meant for making bolt heads?

8. Select a suitable manufacturing process for manufacturing Cooker handles and switches?



PART B - (4 X16 = 64 marks)

09. (a) You are assigned a job of manufacturing a hollow stepped cone pulley by casting (16) process which has three steps and the dimensions of each steps are as follows

1st step – Φ 40 X 40 mm, 2nd step - Φ 35 X 40 mm , 3rd step - Φ 20 X 40 mm. The number of components required is 10. Select a suitable mould, pattern material and also the step involved in preparing the mould for the above component. Also justify your selection.

(OR)

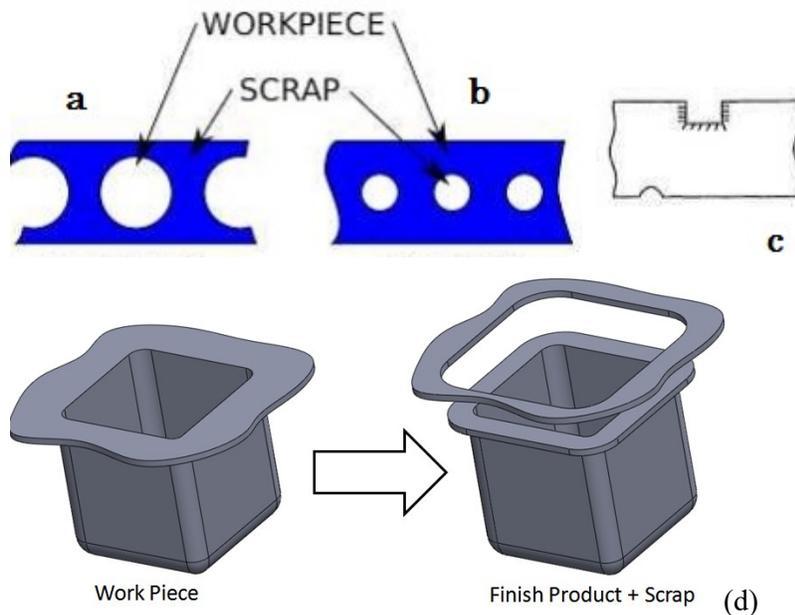
- (b) (i) An engine block from aluminium alloy for small passenger cars has to be manufactured in large quantity. Select a suitable mould, pattern material and explain the process in detail. Also justify your selection. (8)
- (ii) Products for dental applications need to be manufactured. Suggest a suitable casting process and explain in detail with a neat sketch. (8)
10. (a) (i) Name and explain the arc welding process that uses a non consumable electrode and also inert gases for providing shielding atmosphere. (8)
- (ii) Name and explain the arc welding process suitable welding thicker plates in vertical direction in a single pass. (8)

(OR)

- (b) (i) Name and explain the fusion welding process suitable for repairing the rails. (8)
- (ii) Name the welding process that is suitable for welding the drill tool made of High carbon steel to the shank material made of low carbon steel. Also explain their process parameters. (8)
11. (a) (i) Refer the following diagram and express your view with respect to the importance of the grain flow in each process and comment which process possesses superior mechanical properties. (8)



- (ii) Draw a suitable roll pass design to manufacture Slabs. (8)
- (OR)**
- (b) (i) How the hollow pipes or tubes are manufactured in direct extrusion? Explain with a simple sketch. (8)
- (ii) What are the process available to manufacture Pipes or tubes without joints? Explain any one with simple sketch? (8)
12. (a) (i) The following figure shows the various sheet metal operations. Name them and write a short note on those operations. (8)



- (ii) Name and explain a sheet metal forming process in which the sheet metal is intentionally stretched and simultaneously bent to have the shape change. (8)
- (OR)**
- (b) (i) Plastic PET bottles are to be manufactured in mass production? Select a suitable manufacturing process and explain with a neat sketch. (8)
- (ii) In which process a flat thermoplastic sheet is heated and deformed into the desired shape. Explain with a simple sketch. (8)