[Total No. of Questions - 9] [Total No. of Printed Pages - 3]

May-24-0398

ME-401 (Manufacturing Technology-I)

B.Tech. 4th (CBCS)

Time : 3 Hours **Max. Marks : 60**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt one question each from section A, B, C, D. Section E is compulsory.

SECTION - A

1. (a) How does the solidification of pure metals differ from solidification of alloys? What do you understand by directional solidification? (5)

   (b) Explain the basic function of riser used in sand casting. How shape and size of riser is decided? Find the appropriate size of cylindrical riser when it is placed at (i) side of the cavity and (ii) top of the cavity. (5)

2. A mould of size 65 cm × 30 cm × 16 cm is to be filled up by molten metal in a sand mould casting process. Find the time taken to fill up the mould using (i) top gating system, (ii) bottom gating system. The total height of molten metal in sprue and basin is maintained at 16 cm. Take cross-sectional area of gate as 4 cm^2. (10)

SECTION - B

3. Discuss the different types of rolling mills. Drive the expression for maximum possible reduction in case of strip rolling. (10)

4. A 7 mm diameter rod is drawn into 5 mm rod using a conical die with semi die angle 10°. The coefficient of friction at the

interface is equal to 0.1. Yield strength of the material in tension is equal to 52 N/mm^2. Find (i) drawing power if drawing speed is 3 m/s (ii) maximum possible reduction. (10)

SECTION - C

5. (a) What is solid state welding? Discuss about the friction welding and explosive welding with neat sketch. (5)

   (b) What are the non-consumable electrode arc welding processes? Discuss about the tungsten-inert gas (TIG) welding process with neat sketch. (5)

6. (a) Discuss about the different welding defect. What are different inspection and testing methods to check the quality of welded joint? (5)

   (b) Discuss in brief about resistance (i) spot welding, (ii) projection welding and (iii) seam welding. (5)

SECTION - D

7. List the different materials used in the production of plastic sheet and film. Discuss about the different sheet and film production processes. (10)

8. (a) What is injection moulding? Discuss about the process and equipment of injection moulding with neat sketch. (5)

   (b) Discuss the compression moulding and blow moulding processes. (5)

SECTION - E (Compulsory)

9. (a) What is shell molding?

   (b) Describe the centrifugal casting.

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(c) Describe the functions of core and chaplets.

(d) Explain the drop forging.

(e) Differentiate between blanking and punching operations.

(f) Describe stretch forming.

(g) Differentiate between soldering and brazing.

(h) What is submerged arc welding?

(i) What is forge welding?

(j) What is extrusion in case of plastics? (10×2=20)