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

May-25-0335

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 five questions in all, selecting at least one question each from section A, B, C and D. Section E is compulsory.

SECTION - A

1. (a) What are the different types of pattern allowances? State the reasons for considering different pattern allowances. (5)

   (b) What is a cupola? Name the various zones and discuss their significances. (5)

2. (a) Discuss the defects in casting and their remedies. (5)

   (b) What is investment casting? What are the main material used for making the investment patterns. Write the advantages, disadvantages and application of investment casting. (5)

SECTION - B

3. (a) What is the difference between cold working and hot working processes? Which one is easier to employ and why? (5)

   (b) Discuss the drop forging and press forging process with reference to process and product obtained. (5)

4. (a) Explain the principle underlying the extrusion process. Discuss the various types of extrusion. (5)

   (b) Briefly explain the various sheet metal operations. (5)

SECTION - C

5. (a) Define electric arc welding. Discuss with the help of neat sketch, the principle of arc welding. What is straight polarity and reverse polarity? (5)

   (b) Explain submerged arc welding process with its advantages and application. (5)

6. (a) For welding heavy rail sections, thermit welding is often used. Explain how the heat necessary for the joining process is obtained. (5)

   (b) Differentiate between welding, brazing and soldering. What are the specific situations in which soldering and brazing is used? (5)

SECTION - D

7. Describe with neat sketches the following plastic processing methods stating their advantages and application (a) Injection moulding, (b) Blow moulding. (10)

8. (a) Describe the tools, equipment and challenges associated with power metallurgy. (5)

   (b) Discuss the processes involved in making a powder metallurgy product. What are the important characteristics of powder metallurgy products? (5)

SECTION - E (Compulsory)

9. (a) What are risers and what is their function?

(b) Write the colour coding for pattern and core boxes.

(c) What are the main elements of gating system?

(d) How are seamless tubes produced?

(e) List out the defects in extrusion.

(f) Differentiate between punching, blanking and piercing.

(g) Write two difference between TIG welding and MIG welding.

(h) Why is forge-welding process not commercially used?

(i) What is the difference between thermoplastics and thermo setting plastics?

(j) What do you understand by mixing and blending with reference to powder metallurgy? (10×2=20)