

[Total No. of Questions - 9]
(2063)

[Total No. of Printed Pages - 4]

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B.Tech 4th Semester Examination

Manufacturing Technology - I

ME-4002

Time : 3 Hours

Max. Marks : 100

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 : (i) Attempt all the sections. Each section carries equal marks.

(ii) Attempt any one question from each section of A, B, C and D.

(iii) Section E is compulsory,

(iv) Assume, if there are any missing data.

SECTION - A

Attempt any one of the following questions:

(20)

1. What are the points which a designer should consider when going for a casting process? State the typical applications of casting process as used in automobile sector. Explain the procedure to be followed for making a sand mould.
2. What are the distinguishing features between a casting and a pattern? Distinguish between liquid shrinkage and solid shrinkage as related to castings. Explain how these are taken care of in designing sand casting.

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SECTION - B

Attempt any one of the following questions: **(20)**

3. Compare precision investment casting and shell moulding from the standpoint of process, product and applications. State the difference between centrifuging and true centrifugal casting.
4. Explain the principle of rolling with net sketch and derive the expression for rolling load.

SECTION - C

Attempt any one of the following questions: **(20)**

5. Distinguish between arc and gas welding processes from the point of view of heat concentration, temperature, ease of operation and running cost. Why is the tungsten inert gas welding preferred for welding aluminium plates? Give reasons.
6. What are the forging defects? Explain all such defects and their remedial methods. Determine the die and punch sizes for blanking and piercing of a circular disc of 20 mm diameter from a C20 steel sheet whose thickness is 1.5 mm. Also calculate the punching and stripping forces. Shear strength of annealed C20 steel is 294 MPa and stripping constant is 0.024.

SECTION - D

Attempt any one of the following questions: **(20)**

7. Explain the resistance welding process giving the equipment, parameters controlled and the applications. Distinguish giving reasons, between joining of sheets in resistance welding and arc welding, from the point of current required and duration of the welding.
8. Describe the electro slag welding process. Compare electro slag welding process with that of submerged arc welding from the stand-point of heat liberated, joint preparation and welding position.

SECTION - E

Attempt all the following questions: **(2×10)**

9. (i) What do you understand by core prints, chaplets and chills?
(ii) Distinguish clearly between the following casting terms:
Moulding sand, backing sand and facing sand.
(iii) What is colour coding?
(iv) Calculate the permeability number of sand if it takes 1 min 25 sec. to pass 2000 cm³ of air at a pressure of 5 g/cm² through the standard sample. Height and diameter of the sand specimen is 50.8 mm.

- (v) What do you understand by hot working and cold working?
- (vi) Give the examples of typical products manufactured by the following forging processes:
 - (a) Machine forging
 - (b) Drop forging
 - (c) Smith forging
 - (d) Press forging
- (vii) How is lubrication done in hot extrusion?
- (viii) How is an arc obtained in arc welding?
- (ix) Give names of products wherein the following processes are used:
 - (a) Spot welding
 - (b) Seam welding
 - (c) Flash welding
- (x) What applications would require for diffusion welding?