

4E1234

Roll No.

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B. Tech. IV - Sem. (Main) Exam., May - 2019

PCC Mechanical Engineering

4ME4 - 06 Manufacturing Processes

AE, ME

Time: 3 Hours

Maximum Marks: 120

*Instructions to Candidates:*

*Attempt all ten questions from Part A, five questions out of seven questions from Part B and four questions out of five from Part C.*

*Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

*Use of following supporting material is permitted during examination. (Mentioned in form No. 205)*

1. NIL

2. NIL

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**PART - A**

**(Answer should be given up to 25 words only)**

**[10×2=20]**

**All questions are compulsory**

Q.1 Why is it necessary for all engineers to be familiar with manufacturing processes?

Q.2 Explain the function of pattern.

Q.3 Define Draft allowance.

Q.4 Differentiate pressurized and unpressurized gating systems.

Q.5 List the various additives used in molding sand.

Q.6 What are the specific merits of cold working over hot working?

Q.7 Why is glass a good lubricant in hot extrusion?

Q.8 Write two differences between Soldering and Brazing.

Q.9 Why is the neutral flame extensively used in oxy-acetylene welding?

Q.10 What is the need of pre-sintering over sintering operations?

## **PART - B**

**(Analytical/Problem solving questions)**

**[5×8=40]**

**Attempt any five questions**

Q.1 What are the advantages and disadvantage of casting processes over other manufacturing processes?

Q.2 With neat sketch, describe the shell molding casting process. List the advantages of this process.

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Q.3 Differentiate hot working and cold working of metals. Mention their advantages, disadvantages and applications.

Q.4 How extrusion operations are classified? Explain each extrusion operation with neat sketch.

Q.5 Assume that you are reducing the diameter of two rods, one by simple tension and the other by frictionless indirect extrusion. Which will require more force? Why?

Q.6 Explain the working principle and equipments of ultrasonic welding with neat sketch.

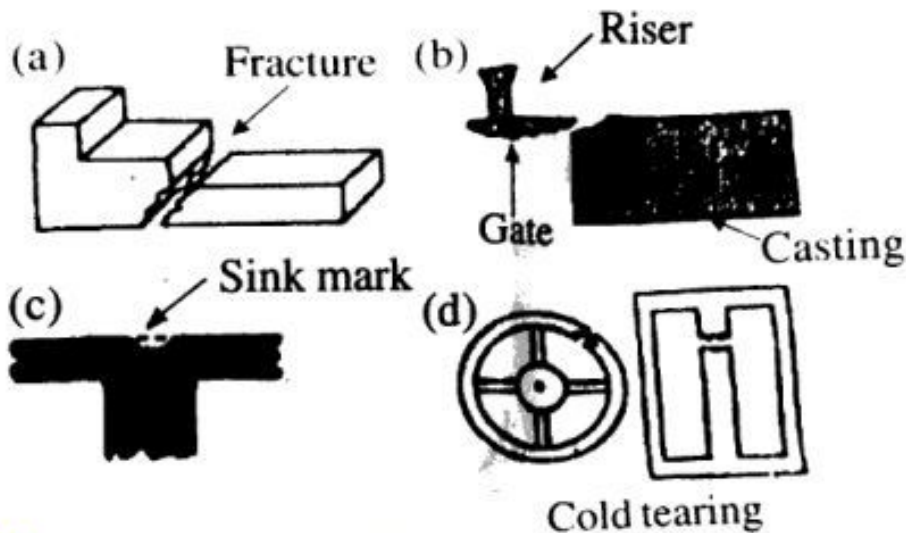
Q.7 Explain any one of the atomization process used for preparing the metallic powder.

## PART - C

(Descriptive/Analytical/Problem Solving/Design Questions) [4×15=60]

Attempt any four questions

Q.1 The figures below indicate various defects and discontinuities in cast products. Review each one and offer solution to avoid them?



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- Q.2 Review the technical literature, and make a detailed list of manufacturing steps involved in the manufacturing of long, metallic hypodermic needles.
- Q.3 Discuss the various defects observed in deep drawing process. What are the main causes of these defects and how can these be eliminated?
- Q.4 Find the best welding speed to be used for the welding of 6 mm steel plates with an ambient temperature of  $30^{\circ}$  with the welding transformer set at 25V and current passing is 300A. The arc efficiency is 0.9 and the possible travel speeds are 6 to 9 mm/sec. The limiting cooling rate for satisfactory performance is  $6^{\circ}\text{C}/\text{sec}$  at a temperature of  $550^{\circ}\text{C}$ .
- Q.5 How will you compare powder metallurgy with other manufacturing processes? Discuss various stages of this process.