



PIE Tech

POLLACHI INSTITUTE OF ENGINEERING AND TECHNOLOGY
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Degree/ Branch : BE., Mechanical Engineering Semester/ Year : III/II

Subject code / Name : ME3391 Manufacturing Process

UNIT – I METAL CASTING PROCESSES

1. What is draft allowance? How is it provided for patterns?

If the vertical faces of pattern are perpendicular to parting line, the edges of mould may be damaged when the pattern is removed from the sand. Hence the vertical faces are made taper for easy removal of pattern. This slight taper given on the vertical sides of pattern is called draft allowance.

2. Enumerate the characteristics of following methods of sand ramming.

a) Hand b) Jolt c) Squeeze d) Slinger

<i>Characteristics</i>	<i>Hand</i>	<i>Jolt</i>	<i>Squeeze</i>	<i>Slinger</i>
Density	Not	Not	Not	Uniform
Ramming sand	uniform	uniform	uniform	
Strength	Not	less	moderate	high
Production rate	less	moderate	fast	Predicated
Accuracy	less	moderate	more	fast
				moderate

3. What are the common allowances provided on pattern?

The various types of pattern allowances normally given are;

1. Shrinkage allowance
2. Machining or finish allowance
3. Draft or taper allowance
4. Distortion or camber allowance
5. Rapping or shake allowance

4. What are the functions of riser?

The main function of the riser is to supply excess molten metal to the solidifying casting; it allows the escape of air.

5. How do patterns differ from castings?

A pattern is slightly larger in size as compared to the casting. A pattern may be in two or three pieces, whereas a casting is in one piece.

6. What are the tests carried out to determine the quality of casting?

Destructive test: Tensile, Impact, Hardness etc.

Non Destructive: Visual, sound, magnetic particles, dye penetration, ultrasonic etc.

7. Define foundry.

A plant where the castings are made is called a foundry.

8. Define casting.

The Process of producing metal parts by pouring molten metal in to the mould cavity of the required shape and allowing the metal to solidify. The solidified metal piece is called as casting.

9. Define mould.

Mould is the cavity of the required casting made in wood, metal or plastics.

10. Define pattern.

The Model of the required casting made in wood, metal or plastics.

11. Name the various pattern materials. Wood – Teak wood, white pine etc. Metal – cast iron, brass, aluminium etc. Plaster
Plastic Wax

12. What are the different types of patterns used in foundries?

Solid or single piece pattern, match plate pattern, split pattern, sweep pattern, skeleton Pattern, segmental pattern, loose piece pattern, shell pattern.

13. When do you make core (or) what is function of core in moulding sand?

To provide a hollow surface or recess on the casting, the core is made.

14. What is core print and what is its purpose?

A core print is an extra projection on the pattern. It supports the core.

15. What do you understand by core setting?

Curing or heating the cores to obtain enough hardness is called as core setting.

16. What are requirements of core sand?

Permeability, refractoriness, strength collapsibility, stability.

17. Mention the specific advantages of CO₂ process.

Give strength and hardness to core
Process cost is less

It saves time on heating

It can be stored for long use

18. What are the properties of good moulding sand?

Porosity or permeability, plasticity or flowability, strength or cohesiveness, adhesiveness, Refractoriness, collapsibility.

19. What are the different types of moulding sand?

Green sand, Dry sand, Synthetic sand, Loam sand, Special sand, parting sand.

20. Write the composition of good moulding sand.

Green sand:

It contains 5 to 8% water and 15 to 20% clay.

Loam Sand:

Loam sand is a mixture of fine sands, fine refractoriness, clay, graphite fiber and water. It contains more clay (50%)

21. List out any five moulding tools.

Shovel, Riddle, Rammer, Trowel, Slick, Strike off bar, lifter

22. What are the uses of runner and riser?

Runner:

It is used to make a sprue or hole in the cope.

It receives the molten metal from the pouring basin and passes to the cavity.

Riser:

It supplies excess molten metal to the solidifying casting. It allows the escape of air.

23. What are chaplets?

Some times it is not possible to provide sufficient support for a core in the mould being poured, if the cores are bigger in size. In such cases the core is supported with rigid metal pieces called chaplets.

24. Mention any 2 differences between green sand mould and dry sand mould.

Green Sand Mould	Dry Sand Mould
Less time for making mould	More time consuming
Less surface finish	Better surface finish
Low strength	Stronger than green sand
Less permeability	More permeability

25. What are the different types of furnaces used for casting?

Cupola furnace, open hearth furnace, crucible furnace, pot furnace, Electric furnace.

26. What is need for providing chills in casting?

The chills are used to provide directional solidification or to increase the rate of Solidification where the higher hardness required.

27. Name four different casting defects.

Shifts - Two halves mismatching or casting Hot tear - Internal or external cracks

Fins - Thin projection of parting line Inclusions - Foreign material present in casting

PART– B

1. What are the pattern making allowances and briefly explain them. (Au-May/June 2006,07)

2. How green sand mould is prepared?

3. Explain the properties of moulding sand.

4. Explain the properties of pattern .

5. Briefly explain the carbon dioxide CO₂ moulding process and state two important merits and demerits.

6. Explain the Centrifugal casting process

7. List any eight casting defects, their causes and remedies

8. Explain the Ceramic mould casting process.

9. Give the sequence of step in pressure die casting process.

10. Briefly explain the different methods for inspection of casting.

11. Describe the operation of a cupola furnace for melting cast iron.

12. How are the patterns classified? Describe any two types with sketches and state the uses of each of the.

13. Enumerate the casting defects and suggest suitable remedies.

14. Explain the properties required for moulding sand?

15. Explain the preparation of moulding sand process.

16. Explain any one type of centrifugal casting.

17. Name any five casting defects and explain the remedies.