

G.P JAJPUR

MECHANICAL DEPARTMENT

QUESTION BANK

PRODUCTION TECHNOLOGY, 3RD SEMESTER

MODULE 1

METAL FORMING PROCESSES

SHORT ANSWER TYPE QUESTIONS (2 MARKS AND 5 MARKS)

1. Define extrusion.
2. List various types of metal forming processes.
3. Classify extrusion process.
4. How are collapsible tubes of aluminum (tooth paste tubes) manufactured? Explain.
5. What is impact extrusion?
6. What are the differences between impact extrusion and cold extrusion forging?
7. How is lubrication done in hot extrusion?
8. What are the lubricating methods employed for extrusion of steel?
9. What are the advantages of hot working over cold working?
10. What are the specific merits of cold working over hot working?
11. What is the significance of recrystallisation temperature in metal working?
12. Define rolling.
13. Classify rolling processes.
14. Differentiate between cold rolling and hot rolling processes.
15. List the different types of rolling mills used in Rolling process.

LONG ANSWER TYPE QUESTIONS (8 MARKS)

1. Explain with sketches the differences between direct and indirect extrusion.

2. Show by schematic sketches the process of forward and backward extrusion. Discuss their relative merits and demerits. Give two examples of components produced by extrusion.
3. How many types of rolling mills are there in commercial use? Describe their arrangement of rolls, specific uses and other details.
4. Sketch and describe the different types of rolls used in rolling mills.

MODULE 2

WELDING

SHORT ANSWER TYPE QUESTIONS (2 MARKS AND 5 MARKS)

1. Define welding.
2. Classify welding processes.
3. What are the functions of flux used in welding?
4. What are the required properties of a flux?
5. What is Welding and why is it done?
6. What is Resistance Welding? Give its classification.
7. Describe with the help of a neat sketch the principle of Spot Welding.
8. Briefly explain Butt welding and Seam welding.
9. Explain with the help of a neat diagram the principle of Flash welding.
10. What is seam welding?
11. What do you understand by Gas welding?
12. Describe in brief the equipment required for Oxy-acetylene Welding and Cutting.
13. What is the main difference between the Blow-pipes used for High pressure and Low pressure gas welding? Explain with the help of suitable sketches.
14. Briefly describe various types of flames in gas welding.
15. Describe with the help of suitable sketches the various types of joints made in welding.
16. What procedure you will follow and what care will you take in operating: (i) A low pressure plant (ii) A high pressure plant.
17. (a) What is an Electric Arc method of Welding?

- (b) How many methods of Arc welding do you know?
18. Give a list of equipments required in general for Electric Arc Welding.
 19. Compare the merits and demerits of using A.C. and D.C. for arc welding.
 20. What is Forge or smithy welding?
 21. What are the electrodes used in Arc Welding made of?
 22. What are Electrode Coverings and why are they provided?
 23. How is an Electrode specified? Explain with example.
 24. What factors govern the selection of an Electrode?
 25. Differentiate between TIG and MIG.
 26. What are 'Acceptable' and 'Unacceptable' welding defects? What factors govern them?
 27. (a) What are common sources of Welding Defects? (b) List the common Welding Defects.
 28. What is Porosity? Why and in how many forms does it occur?

LONG ANSWER TYPE QUESTIONS (8 MARKS)

1. What different methods of welding you know? Describe them in brief.
2. Write short notes on:
(i) Welding rods (ii) Fluxes (iii) Gas flames.
3. Explain oxy acetylene welding process in detail.
4. Explain the principles of Arc-welding in detail.
5. (a) What do you understand by the term 'Polarity'?
(b) What is the advantage of having different polarities?
6. Describe briefly the methods of Carbon arc and Metallic arc welding.
7. Explain the processes of Soldering and Brazing. Write short notes on: (a) Leftward welding (b) Rightward welding (c) Vertical welding
8. Describe the following welding methods and their specific applications: (a) TiG welding (b) MIG welding (c) CO₂ MIG welding.
9. Write short notes on any two of the following Welding Defects and their remedies: (a) Inclusions (b) Cracks (c) Overlapping (d) Incomplete Penetration (e) Inadequate fusion.
10. Describe the following welding defects and their remedies: (a) Spatter (b) Distortion (c) Faulty profile and weld size (d) Poor Penetration

MODULE 3

CASTING

SHORT ANSWER TYPE QUESTIONS (2 MARKS AND 5 MARKS)

1. Define casting.
2. Classify casting process.
3. What is a pattern?
4. How patterns are classified?
5. What are the common materials used for pattern-making? Discuss their relative merits and demerits.
6. What are the factors which govern the selection of a proper material for pattern-making?
7. What are Master Patterns? How does their size differ from other patterns?
8. Explain the use of a solid pattern?
9. What are Split and Multi-piece patterns? What are the advantages of making them in two or more pieces? Give examples.
10. What is the specific advantage of Match plate patterns? Describe how they are used for making the moulds.
11. Sketch and describe the use and advantages of a Gated pattern.
12. How are Skeleton Patterns made? What is the advantage of using such patterns?
13. Describe, with the help of a neat sketch, the working of a Sweep pattern stating its advantages.
14. How are the different mould materials classified? What are the factors which influence their selection for a particular use?
15. How do natural moulding sands differ from synthetic sands? Enumerate a few sources of obtaining moulding sands in India.
16. What is meant by 'Green strength' and 'Dry strength' as applied to a moulding sand?
17. Explain, how the grain size and shape affect the performance of foundry sand.
18. What is the function of additives in moulding sands? Explain the effects of various additives used in moulding sands.
19. On what factors depends the selection of suitable core sand? What main characteristics a good core sand should possess?

20. Which are the main core binders?
21. What are 'mould and core facings'? Why are they used?
22. State the effects of clay and moisture on permeability of moulding sand.
23. Why are the following materials added to moulding sand?
(a) Dextrin (b) Silica flour (c) Sea coal (coal dust) (d) Wood flour.
24. What do you understand by the term 'mould' and 'core'?
25. What is a riser?
26. What is the function of a riser?
27. What is a core? What is its use?
28. Classify cores.
29. What are the characteristics of a good core.
30. What are chaplets?
31. What are crucible furnaces? Where are they preferred and why?
32. How is the thermal efficiency of a cupola determined?
33. Why care is necessary in operating the cupola?
34. What is the difference between gravity die casting and pressure die casting?
35. What is a vacuum die casting? What are its main advantages?
36. Write a short note on die casting dies.
37. What are the main advantages and disadvantages of die-casting ?
38. What do you understand from 'centrifugal casting' ? How are the centrifugal casting methods classified ?
39. What are the material commonly used for making the moulds for centrifugal casting ?
40. What are the main factors which are responsible for producing defects in the castings ?
41. List the defects you would expect from the following stating the precautions necessary to prevent them: (i) Improper pouring technique (ii) Poor or defective cores. (iii) Use of defective gating system. (iv) High moisture content in sand.

LONG ANSWER TYPE QUESTIONS (8 MARKS)

1. What are the common allowances provided on patterns? Explain each allowance in detail.

2. How are the patterns classified? Explain each pattern type in detail with sketches.
3. Write short notes on the following, giving suitable sketches wherever necessary: (i) cope and Drag patterns (ii) Follow Board patterns (iii) Segmental patterns. (iv) Core boxes.
4. What are the main characteristics which good moulding sand should possess? How do these characteristics influence the performance of moulding sand during moulding and casting?
5. What are the main constituents of a moulding sand? How are binders classified? Name a few binders of each type.
6. Explain the procedures of Sand mould casting.
7. Explain different types of molding sands with their composition.
8. How many types of cores are there? Explain them with the help of sketches.
9. Explain with the help of neat sketches, the construction and working of the following types of crucible furnaces (a) coal fired pit furnace (b) gas fired crucible furnace (c) oil fired tilting furnace.
10. Make a neat cross sectional sketch of a cupola, indicating its various zones and describe the following (i) its construction (ii) advantages (iii) methods of charging (iv) different zones and their functions (v) its operation
11. Sketch and explain the construction and operation of a hot chamber die casting machine.
12. How does a cold chamber die casting machine differ from a hot chamber die casting machine? Explain the working of a cold chamber machine with the help of a diagram.
13. Discuss the advantages, disadvantages and application of hot chamber and cold chamber die casting.
14. With the help of a neat diagram describe the process of true centrifugal casting. How can this method be used for production of pipes ? What are the advantages and disadvantages of true centrifugal casting ?
15. Illustrate and describe the process of semi-centrifugal casting.
16. What is centrifuging ? Describe the process, stating its differences with other centrifugal casting methods.

17. Name the various defects which occur in sand castings and state their probable causes and remedies.
18. Discuss briefly the causes and remedies of the following casting defects: (i) Blow holes (ii) Hot tears (iii) Shrinkage cavities (iv) Gas porosity (v) Scabs.
19. Write short notes on the following casting defects : (1) Misrun and cold shuts (ii) Cuts and washes. (iii) Sand inclusions (iv) Metal penetration (v) Drops (vi) Warpage.
20. Explain the causes and remedies of the following casting defects : (i) Fusion (ii) Shot metal (iii) Shifts (iv) Rat tails or buckles (v) Swells (vi) Hard spots (vii) Run out. (viii) Crushes.

MODULE 4

Powder Metallurgy

SHORT ANSWER TYPE QUESTIONS (2 MARKS AND 5 MARKS)

1. What is meant by 'Powder metallurgy' ?
2. What are the main stages of powder metallurgy process ?
3. Enumerate the main characteristics of metal powders.
4. What are the primary and secondary processes, used for processing of metal powders ?
5. Describe the 'Sintering' process in detail.
6. Explain the utility and applications of secondary processes in powder metallurgy.
7. What are 'cermets'? Give a few examples of useful applications of powder metallurgy.
8. What are cemented carbides ? How are they processed ?
9. What are the advantages of powder metallurgy processes ?
10. What are the disadvantages and limitations of powder metallurgy ?

LONG ANSWER TYPE QUESTIONS (8 MARKS)

1. What are the different methods of producing metal powders ? Describe the 'Atomisation' process in detail.
2. Explain the following powder metallurgy processes :

- (a) Blending or mixing (b) Briquetting or compacting (c) Pre sintering.
3. Describe the methods of producing components by powder

MODULE 5
PRESS WORK

SHORT ANSWER TYPE QUESTIONS (2 MARKS AND 5 MARKS)

1. What is blanking operation in press work?
2. What is piercing operation?
3. What is trimming operation?
4. List various types of dies used in press work. State their applications.
5. List various types of punch used in press work. State their applications.

LONG ANSWER TYPE QUESTIONS (8 MARKS)

1. With the help of schematic diagrams explain working of simple dies and compound dies. State their advantages and disadvantages.
2. With a neat sketch explain the working of progressive die. Write its advantages and disadvantages.

MODULE 6
JIGS AND FIXTURES

SHORT ANSWER TYPE QUESTIONS (2 MARKS AND 5 MARKS)

1. What is jig?
2. What are jigs and fixtures ? Why are they used ?
3. What essential factors will you consider while designing a jig or a fixture ?
4. Explain the aspect 'Degrees of freedom of movement of a free body' with special reference to jigs
5. What different types of 'locating pins' you know ? Illustrate and explain their uses.

LONG ANSWER TYPE QUESTIONS (8 MARKS)

1. What is the difference between a jig and a fixture ? What are the main advantages of using jigs and fixtures in mass production ?
2. What are the main elements of jigs and fixtures ? What is the principle of 'Six-point location' ? Explain.
3. What important considerations should be made in location of workpieces ? What are 'locating devices' or 'locators' ? Which factors govern the selection of a locator ?
4. State the principle of locations. Describe the methods of location with respect to 3-2-1 point location of rectangular jig.
5. How are jigs classified? Give a broad classification of jigs you know.
6. How are fixtures classified? Give a broad classification of fixtures you know.