



UNIVERSITY OF RUHUNA

Faculty of Engineering

End-Semester 4 Examination in Engineering: November 2022

Module Number: ME4304

Module Name: Manufacturing Engineering

[Three Hours]

[Answer all questions]

Question paper consists of two parts. Part I: Essay and Part II: MCQ.

Part I: Essay Questions

Answer all questions. Each question carries 12.0 marks.

- Q1. a) Can you use a blanking punch for a piercing operation? Explain your answer with neat sketches. [3.0 Marks]
- b) In which aspects hot rolling would differ from cold rolling? Explain your answer with practical advantages over. [3.0 Marks]
- c) What is deep drawing? Explain with neat sketches. [3.0 Marks]
- d) Illustrate and explain the differences between wire and tube drawing processes. [3.0 Marks]
- Q2. a) Compare the relative merits and demerits of welding over adhesive bonding. [3.0 Marks]
- b) Discuss three (03) process selection parameters for welded joints. [3.0 Marks]
- c) Why edge preparation is needed in welding? Explain with neat sketches. [3.0 Marks]
- d) Explain the process of submerged arc welding and list the advantages over other welding processes. [3.0 Marks]
- Q3. a) Give six (06) applications of powder metallurgy. [3.0 Marks]
- b) Briefly explain three (03) methods of producing metal powders. [3.0 Marks]
- c) What are the steps involved in the powder metallurgy process? Discuss the importance of each step. Use neat sketches where applicable. [3.0 Marks]
- d) What is the role of sintering in powder metallurgy? [3.0 Marks]

Part II: Multiple Choice Questions (MCQ)

Instructions for candidates

- This Part II contains 40 multiple choice questions.
- Answer all questions. Each question has only one answer.
- Mark your answer on the **answer-sheet** provided in **page number 8**.
- **For each question, put an X mark on the letter a), b), c), or d) which corresponds to the correct answer, by using a black or blue pen.**
- Each correct answer carries **0.6 marks**.

-
- 1) In which of the following casting process, the sand is mixed with a thermosetting resin to form a mould?
 - a) Shell moulding
 - b) Squeeze casting
 - c) Centrifugal casting
 - d) Die casting

 - 2) Solidification of casting does not depend upon which factor?
 - a) Type of metal
 - b) Thermal properties of metal
 - c) Geometric relationship between volume and surface area
 - d) Surface tension

 - 3) Select which of the following characteristic/s of molten metal influence the fluidity.
 - i) Mushy zone
 - ii) Viscosity
 - iii) Surface tension
 - iv) Inclusion

Which one of the following is correct?

- a) i and ii
 - b) i only
 - c) i, ii and iii
 - d) i, ii, iii and iv
-
- 4) What is the function of cores used in casting?
 - a) To remove dissolved gases
 - b) To avoid defects
 - c) To form hollow region
 - d) To reduce shrinkage porosity

- 5) Which one of the statements is not correct in metal casting?
- | | |
|--|---|
| a) Rapid cooling produces a solidified skin or shell | c) Cast iron has wide mushy zones |
| b) Those grain that have favourable orientation will grow preferentially | d) Lack of uniformity in grains size and distribution will cause anisotropic properties |
- 6) The allowance provided to take care of the contraction of casting is known as?
- | | |
|------------------------|------------------------|
| a) Draft allowance | c) Machining allowance |
| b) Shrinkage allowance | d) Shake allowance |
- 7) While calculating the linear dimension of a material, shrinkage allowance is always__
- | | |
|---------------|---------------|
| a) added | c) multiplied |
| b) subtracted | d) divided |
- 8) Which one of the following is not used to make patterns?
- | | |
|-------------|-------------|
| a) Wood | c) Metals |
| b) Plastics | d) Ceramics |
- 9) Which one of the following will not give good dimensional accuracy in the presence of moisture?
- | | |
|-------------|-------------|
| a) Wood | c) Metals |
| b) Plastics | d) Ceramics |
- 10) To have good surface finish and accuracy which of the allowance is given?
- | | |
|------------------------|------------------------|
| a) Draft allowance | c) Shake allowance |
| b) Shrinkage allowance | d) Machining allowance |
- 11) Green sand mould indicates that _____.
- | | |
|-----------------------------------|-----------------------------|
| a) polymeric mould has been cured | c) mould is green in colour |
| b) mould has been totally dried | d) mould contains moisture |

- 12) In a gating system, the ratio 1: 2: 4 represents _____
- a) sprue base area: runner area: ingate area.
 b) pouring basin area: ingate area: runner area.
 c) sprue base area: ingate area: casting area.
 d) runner area: ingate area: casting area.
- 13) The primary purpose of a sprue in a casting mould is to _____
- a) feed the casting at a rate consistent with the rate of solidification.
 b) act as a reservoir for molten metal.
 c) feed molten metal from the pouring basin to the gate.
 d) help feed the casting until all solidification takes place.
- 14) Which of the following is used to form complex shapes effectively?
- a) Metal casting
 b) Sand casting
 c) Powder metallurgy
 d) Turning
- 15) Pinch effect in welding is the result of _____
- a) electromagnetic forces.
 b) electrostatic forces.
 c) magnetic forces.
 d) electric forces.
- 16) Small weld used to temporarily hold the two pieces is called as _____
- a) crater.
 b) base metal.
 c) tack weld.
 d) Penetration.
- 17) What is the function of a torch?
- a) It controls fuel rate
 b) It mixes fuel and oxygen and controls delivery
 c) It controls oxygen rate
 d) It mixes fuel and hydrogen
- 18) The depth up to which the filler material is mixed up with base metal is called as _____?
- a) deposition
 b) reinforcement
 c) penetration
 d) fusion depth

- 26) Due to which of the following reasons, distortion in welding occurs?
- a) Oxidation of weld pool
 - b) Use of high voltage
 - c) Improper clamping
 - d) Use of high current
- 27) Where does maximum flame temperature occur?
- a) Next to inner zone
 - b) At the inner zone
 - c) At the tip of the flame
 - d) At the outer zone
- 28) In which of the following welding processes, electrode gets consumed?
- a) TIG welding
 - b) Resistance welding
 - c) Thermit welding
 - d) Arc welding
- 29) Which of the following statements about arc welding is incorrect?
- a) Increased corrosion resistance
 - b) Even materials like stainless steel and aluminium can be welded
 - c) No flux required
 - d) High welding speed
- 30) Which of the following percentage of carbon in steel is most weldable?
- a) 0.15
 - b) 0.25
 - c) 0.35
 - d) 0.8
- 31) The coating material used for the electrode is termed as?
- a) Flux
 - b) Slag
 - c) Protective layer
 - d) Deoxidiser
- 32) Which of the following welding process in which two pieces to be joined are overlapped and placed between two pointed electrodes?
- a) Seam welding
 - b) Resistance welding
 - c) Projection welding
 - d) Spot welding
- 33) Which of the following defects occur due to flux employed and electrode coating?
- a) Inclusion of slag
 - b) Inadequate penetration
 - c) Incomplete fusion
 - d) Porosity

Answer-sheet for the MCQs (Part II)

Index Number:

Question	Answer			
	a)	b)	c)	d)
1)	a)	b)	c)	d)
2)	a)	b)	c)	d)
3)	a)	b)	c)	d)
4)	a)	b)	c)	d)
5)	a)	b)	c)	d)
6)	a)	b)	c)	d)
7)	a)	b)	c)	d)
8)	a)	b)	c)	d)
9)	a)	b)	c)	d)
10)	a)	b)	c)	d)
11)	a)	b)	c)	d)
12)	a)	b)	c)	d)
13)	a)	b)	c)	d)
14)	a)	b)	c)	d)
15)	a)	b)	c)	d)
16)	a)	b)	c)	d)
17)	a)	b)	c)	d)
18)	a)	b)	c)	d)
19)	a)	b)	c)	d)
20)	a)	b)	c)	d)

Question	Answer			
	a)	b)	c)	d)
21)	a)	b)	c)	d)
22)	a)	b)	c)	d)
23)	a)	b)	c)	d)
24)	a)	b)	c)	d)
25)	a)	b)	c)	d)
26)	a)	b)	c)	d)
27)	a)	b)	c)	d)
28)	a)	b)	c)	d)
29)	a)	b)	c)	d)
30)	a)	b)	c)	d)
31)	a)	b)	c)	d)
32)	a)	b)	c)	d)
33)	a)	b)	c)	d)
34)	a)	b)	c)	d)
35)	a)	b)	c)	d)
36)	a)	b)	c)	d)
37)	a)	b)	c)	d)
38)	a)	b)	c)	d)
39)	a)	b)	c)	d)
40)	a)	b)	c)	d)