UNIVERSITI KUALA LUMPUR
KAMPUS CAWANGAN MALAYSIAN SPANISH INSTITUTE

FINAL EXAMINATION

OCTOBER 2025 SEMESTER

COURSE CODE	:	SFB35103 (V2)
COURSE TITLE	:	MANUFACTURING TECHNOLOGY
PROGRAMME NAME	:	BACHELOR OF ENGINEERING TECHNOLOGY (HONS) IN MANUFACTURING (AUTOMOTIVE)
DATE	:	29 JANUARY 2026
TIME	:	2:00PM - 4:30PM
DURATION	:	2 HOURS 30 MINUTES

INSTRUCTIONS TO CANDIDATES

1. Please read the instructions given in the question paper CAREFULLY.
2. This question paper is printed on both sides of the paper.
3. This question paper consist of TWO sections.
4. Answer ALL questions for Section A.
5. Section B consist of four questions. Answer THREE (3) questions only.
6. Please write your answer on the answer booklet provided.
7. Please answer all questions in English only.
8. Please answer MCQ/EMQ questions using OMR sheet. ☑ *Tick if applicable*
9. Refer to the attached Formula/ Appendies. ☑ *Tick if applicable*

THERE ARE 3 PAGES OF QUESTIONS INCLUDING THIS PAGE

SECTION A (Total: 40 marks)

Answer ALL questions.

Please use the answer booklet provided.

1. Which of the following is the main material in a sand mold?

   A. Iron oxide

   B. Graphite

   C. Silica sand (SiO_2)

   D. Aluminum oxide

2. What is the function of the riser in a mold?

   A. To vent gases

   B. To pour molten metal

   C. To support the core

   D. To supply molten metal during shrinkage

3. What causes porosity in welds?

   A. Excessive cleaning

   B. Too much filler metal

   C. Lack of pressure

   D. Gas trapped during solidification

4. Which type of crack occurs along the length of the weld?

   A. Longitudinal crack
   B. Crater crack
   C. Transverse crack
   D. Toe crack

5. What type of welding uses high-velocity impact for joining metals?

   A. Diffusion bonding
   B. Arc welding
   C. Cold welding
   D. Explosion welding

6. Which joining method is most suitable for electronic manufacturing?

   A. Brazing
   B. Adhesive bonding
   C. Welding
   D. Soldering

7. Which of the following materials is *not* used for expendable molds?

   A. Plaster
   B. Ceramic
   C. Steel
   D. Sand

8. What is the main advantage of using a permanent mold?

   A. It can be reused multiple times

   B. It is cheaper than sand molds

   C. It requires no cooling

   D. It has better permeability

9. Which rolling defect is caused by uneven elongation between the center and edges of a strip?

   A. Wavy edge

   B. Zipper crack

   C. Edge crack

   D. Alligatoring

10. Which term refers to the dividing line between two molding flasks?

    A. Core print

    B. Gate

    C. Runner

    D. Parting line

11. The draft allowance in pattern making is provided to _____.

    A. Compensate for shrinkage

    B. Facilitate easy removal from the mold

    C. Avoid hot tearing

    D. Improve surface finish

12. Which of the following patterns is used when a part cannot be withdrawn easily from the mold?

    A. Skeleton pattern

    B. Match plate pattern

    C. Loose piece pattern

    D. Sweep pattern

13. What is the function of the vent in a mold?

    A. To remove gases

    B. To supply molten metal

    C. To support the pattern

    D. To shape the cavity

14. What is the main function of a sprue in a mold?

    A. To eject the part

    B. To provide a path for molten plastic to enter the runner

    C. To remove air from the mold

    D. To cool the molded part

15. Which material is MOST commonly used for sand casting molds?

    A. Graphite

    B. Alumina

    C. Silica sand

    D. Cement

16. What is the main characteristic of thermoplastics?

A. Are always brittle

B. Must be cured chemically

C. Can be remelted and reformed multiple times

D. Cannot be remelted after formation

17. Why do people use statistics in their daily lives?

A. To make random guesses

B. To avoid using any data

C. To decorate reports with numbers

D. To make informed decisions based on data

18. What is the purpose of draft angles in part design?

A. Facilitate easy ejection of the molded part

B. Improve surface finish

C. Reduce mold temperature

D. Prevent shrinkage

19. The reduction in size of a molded part as it cools is known as _____.

A. Creep

B. Shrinkage

C. Compression

D. Warping

20. Why are radius corners important in injection molded parts?

A. Add decorative effects

B. Improve material flow and reduce stress concentration

C. Increase cooling rate

D. Reduce tooling cost

21. One of the key part design principles is to maintain _____.

A. Sharp corners

B. Extremely thick walls

C. Constant wall thickness

D. Variable wall thickness

22. What is welding?

A. A temporary joining method

B. A process that uses adhesives to bond metals

C. A cold mechanical fastening process

D. A process of joining metals using heat and or pressure

23. Which welding process uses a consumable electrode and shielding gas?

A. Plasma arc welding

B. TIG welding

C. Ultrasonic welding

D. MIG welding (GMAW)

24. Which of the following is not a welding defect?

A. Slag inclusion

B. Cracks

C. Porosity

D. Surface hardening

25. Permanent molds are made of _____.

A. Sand

B. Plaster

C. Clay

D. Metal

26. Which of the following is a *fusion welding* process?

A. Friction welding

B. Ultrasonic welding

C. Cold welding

D. Oxyacetylene gas welding (OAW)

27. Which of the following processes is *not* suitable for thermoplastic materials?

A. Blow molding

B. Resin transfer molding (RTM)

C. Injection molding

D. Vacuum forming

28. Which of the following occurs inside the barrel during the injection molding process?

A. Melting and mixing of the plastic material

B. Opening of the mold

C. Ejection of the molded part

D. Cooling and solidification of the plastic

29. Which casting process is MOST suitable for producing components with excellent surface finish and dimensional accuracy?

A. Die casting

B. Investment casting

C. Sand casting

D. Shell molding

30. Which type of pattern is used for large axisymmetric castings such as pipes?

A. Skeleton pattern

B. Loose piece pattern

C. Sweep pattern

D. Follow board pattern

31. Thermosetting plastics differ from thermoplastics because they _____.

A. Cannot be remelted after formation

B. Can be remelted and reshaped

C. Soften when heated

D. Are used only in extrusion

32. What problem can occur if the wall thickness is not uniform?

A. Improved strength

B. Warpage, voids, and sink marks

C. Better cooling

D. High production rate

33. Which type of welding uses a non-consumable electrode?

A. Gas metal arc welding (GMAW)

B. Shielded metal arc welding (SMAW)

C. Flux-cored arc welding (FCAW)

D. Gas tungsten arc welding (GTAW/TIG)

34. Which welding process joins materials by bringing atoms close together without melting the base metals?

A. Oxy-Fuel Gas Welding

B. Resistance Spot Welding

C. Solid-state welding

D. Gas Metal Arc Welding (GMAW)

35. Which defect may occur if gases are not properly vented from the mold?

A. Cold shut

B. Flash

C. Hot tearing

D. Gas porosity

36. Which type of mold is destroyed after each casting?

A. Composite mold

B. Permanent mold

C. Metal mold

D. Expendable mold

37. The shiny side of aluminium foil produced by pack rolling is due to:

A. Oxidation

B. Acid pickling

C. High rolling speed

D. Contact with polished rolls

38. Pack rolling is commonly used in the production of:

A. Aluminium foil

B. Steel plates

C. Wire rods

D. Railroad rails

39. Which mold component compensates for metal shrinkage during solidification?

A. Sprue

B. Riser

C. Gate

D. Runner

40. Which rolling process uses profiled rolls to form tapered shafts?

A. Continuous rolling

B. Thread rolling

C. Skew rolling

D. Roll forging

SECTION B (Total: 60 marks)

Answer THREE (3) questions only.

Please use the answer booklet provided.

Question 1

The rolling process is a fundamental metal forming operation in which the thickness or cross-section of a workpiece is reduced by compressive forces applied through rotating rolls.
Based on the rolling process described above, answer the following questions:

i. Define the rolling process and explain its basic working principle.

(5 marks)

ii. Explain the purpose of hot rolling in breaking down cast structures.

(5 marks)

iii. Describe FOUR common defects in rolled plates and sheets and state ONE cause for each.

(5 marks)

iv. Explain FOUR different rolling processes and state ONE typical product for each.

(5 marks)

Question 2

This question is based on Thermoplastic Injection Molding.

i. Explain the fundamental difference between thermoplastic and thermosetting polymers in terms of molecular structure and reprocess ability.

(5 marks)

ii. Critically discuss five advantages of injection molding that make it suitable for high-volume industrial production.

(5 marks)

iii. Analyze the impact of part design parameters on the quality of injection-molded components. Discuss THREE parameters.

(5 marks)

iv. Evaluate the role of tooling components in controlling material flow and part quality. Explain THREE components.

(5 marks)

Question 3

This question is based on CNC Punching / Turret Punch Machine.

i. Define CNC punching and state its main function in sheet metal fabrication.

(5 marks)

ii. State FIVE main parts of a CNC punching machine and explain the function of EACH part.

(5 marks)

iii. Describe the working principle of the punching (cutting) operation using punch and die.

(5 marks)

iv. Explain the three CNC punching programming features shown in the diagram.

(5 marks)

Question 4

Welding is an important joining process widely used in manufacturing industries to permanently join metallic materials.

i. Explain the difference between fusion welding and solid-state welding.

(5 marks)

ii. List and explain THREE common welding defects and their causes.

(5 marks)

iii. State the advantages and disadvantages of Oxyacetylene Gas Welding (OAW).

(5 marks)

iv. Explain the working principle of friction welding and list its advantages.

(5 marks)

END OF EXAMINATION PAPER