



Name :

Roll No. :

Invigilator's Signature :

CS/B.Tech(AUE-OLD)/SEM-3/AUE-304/2012-13

2012

MANUFACTURING METHODS

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

GROUP - A

(Multiple Choice Type Questions)

1. Choose the correct alternatives of the following : $10 \times 1 = 10$
 - i) The main criterion for selection of electrode diameter in arc welding is
 - a) material to be welded
 - b) type of welding process
 - c) thickness of material
 - d) voltage used.
 - ii) Projection welding is
 - a) multi-spot welding process
 - b) continuous spot welding process
 - c) used to form mesh
 - d) none of these.
 - iii) In thermit welding, the iron oxide and aluminium oxide are mixed in the proportion of
 - a) 1 : 1
 - b) 3 : 1
 - c) 1 : 3
 - d) mixture of different oxides.



- iv) Sands are graded according to their
 - a) source of origin
 - b) strength
 - c) permeability
 - d) clay content and grain size.
- v) Loams are comprises
 - a) 50% sand and 10% moisture
 - b) 40% sand and 10% moisture
 - c) 50% sand and 18% moisture
 - d) 50% sand and 20% moisture.
- vi) Which of the following is not a part of shaper ?
 - a) Clapper box
 - b) Ram
 - c) Table
 - d) Cross slide.
- vii) Lathe bed is usually made of
 - a) Cast iron
 - b) Stainless steel
 - c) Mild steel
 - d) Structural steel.
- viii) The helix angle of a HSS twist drill for drilling cast iron is of the order of
 - a) $14^\circ - 22^\circ$
 - b) $24^\circ - 32^\circ$
 - c) $35^\circ - 40^\circ$
 - d) $40^\circ - 50^\circ$.
- ix) Hot tears refer to
 - a) casting defect
 - b) process of fabrication
 - c) process of heat treatment
 - d) strengthening of alloys.
- x) In sand moulding, the middle part of the flask is called
 - a) Cope
 - b) Drag
 - c) Cheek
 - d) Flask-middle.



GROUP - B
(Short Answer Type Questions)

Answer any *three* of the following.

3 × 5 = 15

2. What are the common allowances provided on pattern and why ?
3. Define cutting tool signature of a single point cutting tool.
4. Describe spot welding in brief.
5. Calculate the change gears for indexing to give 83 divisions.

GROUP - C
(Long Answer Type Questions)

Answer any *three* of the following.

3 × 15 = 45

6.
 - a) What are the requirements of gating system ? Draw neat sketch of a gating system showing its all components and discuss on their functions in brief.
 - b) Explain in detail 'Investment casting method' with its advantages and applications.
 - c) Mention any two common defects in casting. State their causes and remedies.
7.
 - a) State the principle of arc welding. Describe in detail the formation of arc in arc welding.
 - b) What are the functions of coating on shielded electrode ?
 - c) Write short notes on (i) soldering and (ii) brazing.
 - d) What are the principles of operation of resistance welding ?

(2 + 5) + 4 + 4

(2 + 3) + 3 + 5 + 2



8. a) How can a lathe be specified ?
b) What are the basic parts of a lathe ? Explain briefly with a neat sketch.
c) How can speed variations be obtained in an all geared headstock of a centre lathe ? Explain with figure.
- $3 + (2 + 6) + 4$
9. a) Name and describe the principal parts of a column and knee type milling machine with neat sketch.
b) Distinguish between Up milling and Down milling.
c) What is indexing ? Explain with neat sketch the working of universal dividing head during indexing. Determine the crank movement and gear ratio required to index 83 divisions.
- $5 + 3 + (1 + 3 + 3)$
10. a) What is the fundamental difference between a shaper and planer ?
b) How is the grinding wheel specified ? Explain with an example.
c) Describe twist drill nomenclature using sketches.
d) Find the time required for taking a complete cut on a MS plate of $600 \times 900 \text{ mm}^2$ by a shaper if the cutting speed is 9 m/min. The return time to cutting time ratio is 1 : 4 and the feed is 3 mm. The clearance at each end is 75 mm.
- $2 + 4 + 4 + 5$