

Name :

Roll No. :

Invigilator's Signature :

CS/B.Tech/(ME/PE/AUE-NEW)/SEM-4/ME-403/2013

2013

PRIMARY MANUFACTURING PROCESSES

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 for any *ten* of the following :

$10 \times 1 = 10$

i) Lower part of the moulding flask is called

- a) cope
- b) drag
- c) pouring basin
- d) cavity.



- ii) Shrinkage of cast iron on solidification is nearly
- a) 1%
 - b) 5%
 - c) 6.5%
 - d) 13%.
- iii) Core prints are provided to
- a) form trade mark of company on castings
 - b) produce casting with specific surface design
 - c) form seat to support and hold the core
 - d) direct the flow of molten material during pouring.
- iv) In electric resistance welding, voltage required for heating is
- a) 1 to 5 volts
 - b) 6 to 10 volts
 - c) 11 to 20 volts
 - d) 50 to 100 volts.
- v) Carburizing flame is used to weld
- a) steel, cast iron, copper, aluminium etc.
 - b) brass and bronze
 - c) hard surfacing materials such as stellite
 - d) all of these.



- vi) The amount of heat generation in arc welding is
- a) directly proportional to the resistance
 - b) inversely proportional to the resistance
 - c) directly proportional to current
 - d) inversely proportional to time.
- vii) A non-consumable electrode is
- a) tungsten
 - b) carbon
 - c) graphite
 - d) carbon or graphite.
- viii) Preheating during welding (steel being the base material) is desirable when carbon equivalent is
- a) less than 0.4
 - b) equal to 0.4
 - c) less than 0.5
 - d) more than 0.5.
- ix) Cold rolling is preferred to hot rolling due to
- a) less rolling force
 - b) less operating cost
 - c) higher production rate
 - d) higher surface finish.



- x) Hot working operation is carried out at
- a) above recrystallisation temperature
 - b) below recrystallisation temperature
 - c) near plastic stage temperature
 - d) above room temperature.
- xi) In investment casting patterns are made of
- a) plaster
 - b) plastics
 - c) wax
 - d) none of these.
- xii) The function of welding electrode coating is to
- a) stabilize the arc
 - b) reduce the spatter
 - c) perform metallurgical refining operations
 - d) all of these.
- xiii) Fuller, punch, swages, sledge, flatter are the tools used in
- a) Rolling
 - b) Forging
 - c) Welding
 - d) None of these.



- xiv) Metallic chaplets are used in a mold to
- enhance directional solidification
 - increase the velocity of liquid metal
 - support the core
 - all of these.
- xv) The type of sand sprinkled on the pattern & at the midway between the two mold boxes to prevent the adherence of the molding sand, is called
- parting sand
 - facing sand
 - backing sand
 - all of these.

GROUP - B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

- Discuss the concept of straight and reverse polarity in arc welding with neat sketches.
- Describe with the help of sketches the three types of oxy-acetylene flames.
- What is Grain Fineness Number (GFN) and how is it experimentally determined ?



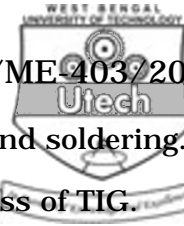
5. Name the different pattern allowances and discuss their need.
6. Compare the relative advantages and disadvantages of hot and cold working.
7. In a single flat rolling operation a 400 mm wide steel strip having thickness of 10 mm is reduced to 8 mm by using rolls of diameter 600 mm. Find the contact length of the roll strip with the work piece.

GROUP - C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

8. a) Define green strength and dry strength of molding sand.
b) Draw and describe a cupola.
c) What are different casting defects ? Describe any two of them. $5 + 5 + 2 + 3$
9. a) Explain pressure die casting and their application.
b) Explain different types of centrifugal casting process.
c) Explain plasma arc welding and ultrasonic welding in brief. $4 + 4 + 7$



10. a) Differentiate between welding, brazing and soldering.
b) With the aid of sketch explain the process of TIG.
c) Explain with neat sketches the process of sub-merged arc welding process and its applications. 4 + 5 + 6
11. Write short notes on any *three* of the following : 3 × 5
- a) Centrifugal casting
b) Hot and cold rolling
c) Effect of DCSP, DCRP and AC current on arc welding
d) Smith forging and drop forging.
12. a) Differentiate between Punching and Blanking with neat sketch.
b) Write down the principle of rolling showing sketches of roll arrangement.
c) In a rolling process, sheet of 25 mm thick is rolled to 20 mm thickness. roll is of diameter 600 mm and it rotates at 1000 rpm. What will be roll strip contact length ?
d) What is camber ? 4 + 6 + 4 + 1
13. a) Write down the principles of wire drawing with a neat sketch.
b) What are the common forging defects and the remedial measures to be taken ?
c) Why are clearance and shear angles provided in press tool punch ? 6 + 5 + 4