

Name :

Roll No. :

Invigilator's Signature :

CS / B.TECH(AUE / ME / PE)NEW / SEM-4 / ME-403 / 2012

2012

PRIMARY MANUFACTURING PROCESS

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 × 1 = 10

(i) Sand moulding is generally practised for making

- a) Pipes
- b) Turbine blades
- c) Micro motor body
- d) Machine bed.

(ii) Filling time with top gating system is

- a) greater than that with bottom gating system
- b) equal to that with bottom gating system
- c) less than that with bottom gating system
- d) any one of these.



- (iii) Spot welding is essentially joining of two sheets by
- a) MMA
 - b) MIG
 - c) Friction welding
 - d) Resistant welding.
- (iv) Mild steel wire of 6 mm diameter is made by
- a) Rolling
 - b) Forging
 - c) Extrusion
 - d) Drawing.
- (v) Chills are used in casting moulds to
- a) achieve directional solidification
 - b) reduce blow hole
 - c) reduce freezing time
 - d) increase the smoothness of the casting surface.
- (vi) 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.
- (vii) Which one of the following materials has the negative solidification shrinkage
- a) Steel
 - b) Aluminium
 - c) Copper
 - d) Gray Cast Iron.



- (viii) 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 .
- (ix) Heat affected zone (HAZ) becomes maximum during
- a) MMA welding
 - b) TIG Welding
 - c) MIG Welding
 - d) Gas Welding.
- (x) A solid cylinder of diameter 100 mm and height 50 mm is forged between two frictionless flat dies to a height of 25 mm. The percentage change in diameter
- a) 0
 - b) 2.07
 - c) 20.7
 - d) 41.4 .
- (xi) For piercing a circular hole of diameter 30 mm in 2 mm thick mild steel sheet in a press tool, the diameter of the punch should be
- a) 29.50 mm
 - b) 30.00 mm
 - c) 30.50 mm
 - d) 30.60 mm.
- (xii) If the cooling rate of riser is more than that of casting there will be formation of
- a) Blow hole
 - b) cracks in casting
 - c) Blister
 - d) cold shut.



GROUP – B

(Short Answer Type Questions)

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

2. Distinguish between investment casting and centrifugal casting.
3. Why allowances are kept in pattern making ? Name and explain briefly various pattern makers allowances.
4. What is the significance of recrystallisation temperature in metal working ? What is the difference between drop forging and press forging ?
5. Differentiate between TIG welding and MIG welding processes.
6. Explain submerged arc welding process and its advantages over other arc welding process.

GROUP – C

(Long Answer Type Questions)

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

7. a) Why close tolerances cannot be maintained in hot working of metals ?
b) Explain the influences of lubrication of dies during forging operation.



c) What is 'Flash' ? Explain with a neat sketch.

d) What are the advantages and limitations of Cogging ?

2 + 5 + 3 + 5

8. a) List out the factors on which the selection of welding process depends.

b) Explain the Electron Beam Welding with a sketch.

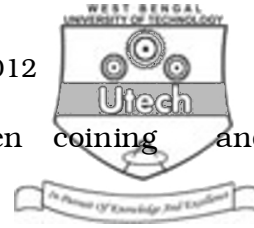
5 + 10

9. a) What will be the solidification time for a 1100 mm diameter and 33 mm thick casting of Aluminum if the mold constant is 2.2 sec/mm^2 ?

b) What is the differences in between a temporary mold and permanent mold ?

c) Explain with neat sketches the step by step operation of upsetting a bar.

5 + 5 + 5



10. a) Enumerate the differences between coining and Embossing.

b) What do you mean by deep draw ability and limiting ratio for this operation ?

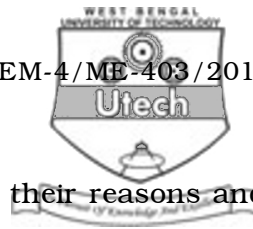
c) A symmetrical cup of circular cross-section with 40 mm diameter and height of 60 mm with a corner radius of 2 mm is to be obtained in C-20 steel of 0.6 mm thick. Make the necessary calculation for finding out the blank diameter. Take trim allowance as 3 mm for the first 25 mm diameter and 3mm for every additional 25mm diameter of cup. 5 + 5 + 5

11. a) A solid carbon steel block of final dimension of 100mm × 75 mm × 60 mm is to be prepared by green sand casting. Find the dimensions of the wooden pattern considering the shrinkage allowance as 3% and machining allowance as 5%.

b) Explain the process of hydrostatic extrusion with a sketch.

c) Differentiate between press forging and drop forging ?

5 + 5 + 5



12. a) List out any five welding defects with their reasons and remedies.
- b) What is Braze welding ? Give at least five applications of braze welding.
- c) Differentiate between Electro slag welding and Electro gas welding. 5 + 5 + 5

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