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 : $10 \times 1 = 10$

(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 × 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 are welding process and its advantages over other arc welding process.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 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 100m × 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