

CS/B.Tech/PWE/SEM-8/PWE-803A/2013

2013

MANUFACTURING SCIENCE

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 the following : $10 \times 1 = 10$

i) The component used for increase in re-enforcement of
mould is

a) chill b) gagger

c) pin d) lug.

ii) Open Hearth is a furnace used to produce

a) steel b) grey cast iron

c) pig iron d) malleable cast iron.

iii) Billets are produced through

a) rolling b) casting

c) forging d) drawing.

iv) ERW pipe is manufactured by the process named as

a) welding b) forming

c) casting d) drawing.

v) The flame used for gas cutting of steel is

a) oxidising b) carburising

c) neutral d) none of these.

vi) Acetylene is stored in cylinders by absorbing in

a) oxygen b) nitrogen

c) acetone d) butane.

vii) The number of atoms present in a body centered crystal

lattice is

a) 9 b) 14

c) 17 d) none of these.

viii) Undercut is a defect in

a) welding b) casting

c) forging d) none of these.

ix) Shrinkage in casting is compensated by

a) riser b) runner

c) in-gates d) sprue.

x) Which of the following refractories has higher melting point ?

a) Silica b) Olivin

c) Zircon d) Chamotte.

GROUP – B

(Short Answer Type Questions)

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

2. Describe the steps involved in making mould.
3. Describe the characteristics of polarity in welding.
4. Differentiate between welding, brazing and soldering.
5. Discuss any *one* of the welding processes :
 - a) MIG b) TIG.
6. Explain the defects in rolling processes.

GROUP – C

(Long Answer Type Questions)

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

7. a) Draw a neat sketch of a gas welding set and mark each component.
 - b) State Chvorinov's rule and its importance in design of riser. $8 + 7$
8. a) Define melting ratio of a furnace.
 - b) Name the furnaces used for steel casting and describe

any one.

c) A cupola, 75 cm in diameter has a melting point ratio of

10 : 1. How much iron is melted per hour ? How much

coke is consumed per hour when a melting rate is

0.562 kg/hr/cm² ? 3 + 6 + 6

9. a) Discuss with relevant sketches, any one of nonconventional modern machining methods.

b) Explain the utility of wax pattern in casting.

c) Find the optimum pouring time of a casting product

with the specifications as follows :

i) Mass density of fluid metal = 6.90 gm/c.c.

ii) Fluidity = 22 inches

iii) Size of casting = 500 mm × 300 mm × 40 mm

(thickness). 6 + 3 + 6

10. a) Differentiate between hot working and cold working.

b) What do you understand by penetration in welding ?

c) Derive an expression for finding out rolling load to be

dealt with production of flat surfaces. 5 + 3 + 7

11. a) Discuss about welding defects and its remedies.

b) Find the choke area of a gating system to meet a casting specification as follows :

i) Size of casting = 400 mm × 250 mm × 50 mm

(thickness)

ii) Density of cast material = 7.85 gm/c.c.

iii) Pouring time = 9 sec

iv) Effective metal head = 100 mm

v) Efficiency factor = 0.9

vi) Density of molten metal = 6.91 gm/c.c. 6 + 9

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