B. E. Part III (6th Semester) Examination, April-May, 2013

Metal Casting Technology (MT 606)

Full marks 70 Time: 3h

1. Answer any Five: 5 x 2

a) Define pattern layout drawing

b) Distinguish between silica sand and zircon sand

c) Why is a core longer than the cavity it is designed to create?

d) Name i) an air-setting organic binder system ii) sand additives for Shell moulding

e) In which process heavier castings can be made- pressure die casting or Permanent mould casting ?

f) In which moulding process, the pattern removal from mould is not necessary? What is the pattern material?

g) Write the formula expressing permeability of standard specimen.

2. Present the complete method for casting a hollow cylinder having internal diameter of 200 mm and cross section of 40mm×40mm 15

3. Write any five 7×5

(a) Prepare a table showing the suitable furnaces for melting the following metals : copper alloy, gray cast iron, alloy cast iron, alloy steel, aluminium alloy in small batches

(b) Name the shortcomings of conventional cupola. What elements are gained or lost during cupola melting?

(c) Discuss briefly the bond formation in i) clay-water system and ii0 in CO2 – sodium silicate system

(d) Discuss the Inoculation treatment of gray cast iron and ductile iron, indicating the role of trace elements in modifying the structure

(e) Write briefly on the 'Modification; of Al-Si alloys and grain refiners for aluminium

(f) State the allowances and additional features to be incorporated in preparing the pattern drawing from the customers drawing

(g) Enumerate the physical principles/laws governing the supply and distribution of liquid metal within the ingate system

(h) Mention the measures necessary to ensure the supply of clean metal within the mould

(i) State Chvorinov's rule. Explain the use of the rule in establishment of the directional solidification with suitable example.

(j) Mention the necessity of using 'Chill'. Determine the weight of external chill in terms of reduced volume considering the heat balance.

12. Write short notes on (any two) 5×2

a) Internal chill

b) Feeding distance

c) Hot tear

d) Washburn core