

Registration No. :

--	--	--	--	--	--	--	--	--	--

Total number of printed pages – 2

B. Tech
PEMT 5407

Eighth Semester Regular / Back Examination – 2015

FERROALLOYS TECHNOLOGY

BRANCH : MME

QUESTION CODE : J 248

Full Marks – 70

Time : 3 Hours

*Answer Question No. 1 which is compulsory and any **five** from the rest.
The figures in the right-hand margin indicate marks.*



1. Answer any **ten** of the following questions : 2×10
- (a) What do you mean by aluminothermic reduction ?
 - (b) What is the difference between Charge-Chrome and Ferro-Chrome ?
 - (c) Mention the starting materials used in the production of FeNb and FeMo.
 - (d) Name three ferroalloys which are used as deoxidizer in steel making.
 - (e) Why electric arc furnaces having sealed cover are preferred for ferroalloys production ?
 - (f) How addition of sinter helps in the production of Ferromanganese ?
 - (g) Why Titanomagnetite cannot be converted to pig iron by direct reduction ?
 - (h) What is spacing of electrode ?
 - (i) Why high silicon alloys are usually of low in carbon ?
 - (j) Name the states (of India) where manganese ore is present.
 - (k) Why in general Ferrochrome is not produced in a blast furnace ?
 - (l) In a refining type of furnace what type of usual reductants are used ?
 - (m) What are the materials present in gangue of chrome ore ?
2. (a) Discuss the recovery of vanadium from ore. 4
- (b) Explain with a neat sketch the process steps involved in ferromolybdenum production by thermit process. 6

P.T.O.

3. Why Ferrosilicon and Ferromanganese are manufactured in a submerged arc furnace ? Discuss the usual controls required for the smooth operation of the furnace ? Explain the use of calcium carbide in hot metal desulphurization. 10

Or

Discuss with a schematic arrangement production of ferroalloys by plasma arc furnace. Mention the advantages of chromium ore smelting in plasma furnace.

4. (a) What are the different type of furnaces are used for the production of ferroalloys ? Discuss the lining of a Ferro-alloy Furnace. 6
(b) Discuss charging of closed-top furnace. 4
5. (a) What are the raw materials required for the production of ferro-silicon ? Explain Physico-chemical Condition of the Process. 7
(b) What are the operational problems in FeSi smelting ? How they are tackled ? 3
6. (a) Discuss the principle of metallothermic reduction. Mention the advantages and limitations of metallothermic over carbothermic reduction. 5
(b) What is tap to tap time of a ferroalloy furnace ? Electrode specific consumption is proportional to tap to tap time justify. 5
7. (a) What are the important ores of chromium ? Discuss the decisive factors for chrome ore selection. 5
(b) Discuss the physic-chemical conditions of reduction smelting process for the production of high carbon ferrochrome. 5
8. Write short notes on any **two** of the following : 5×2
(a) Graphitised electrode.
(b) Thermit process for ferromolybdenum production.
(c) Prospects of Ferroalloys industries in India.
(d) Extra low carbon ferrochrome.
(e) Manufacture of Ferro-boron.