

M.E. Metallurgical and Material Engineering 1st Year 2nd Semester Exam-2024

STEEL TECHNOLOGY

Time : Three hours

Full Marks : 100

	Answer to the following questions.	Marks
1	<p>Diffentiate between the followings (any five)</p> <p>a) - Boudouard Reaction & Carbon Deposition Reaction b) - Diffusion Deoxidation & Precipitation Deoxidation c) - Carbothermic Reduction & Silicothermic Reduction for production of Ferroalloys d) - Acid Sinter & Fluxed Sinter e) - Tonnage-grade Ferroalloys & Speciality-grade Ferroalloys f) - DRI & HBI.</p>	5 X 4
2	<p>Write short notes on the followings (any five)</p> <p>a) - Scaffolding b) - Problems in Indian ferro-alloy sector c) - Desulphurisation in Blast Furnace d) - Finex Process e) - Role of AOD/VOD in conventional Stainless Steel Production. f) - Ladle Furnace</p>	5 X 5
3	<p>Answer the followings (any five)</p> <p>a) State the shipping & handling problems of DRI and the remedies. b) State the advantages & disadvantages of OBM process over LD process. c) Write the objectives of Secondary Steelmaking d) Describe the refining process of Electric Arc Furnace steelmaking (mild steel). e) Draw the total process flowchart of Corex process. f) Compare between Midrex and HyL (III) processes.</p>	5 X 5
4	<p>A 'Pig Iron' producing company sells its entire pig iron (600,000 tpy) in the market. The plant consists of 4 No. of mini blast furnace & one sinter plant to cater the blast furnaces.</p> <p>Calculate : The size of the blast furnaces (each). The size of the sinter plant The net sales realization per year (in Rs. Crores) of the company</p> <p>Given : The productivity of the blast furnaces & the sinter plant are 2.005 ton/cum/day 1.187 ton/sqm/hr respectively. Operating days per year of BF'ce & SP are 350 & 330 respectively.. The net selling price of pig iron is Rs. 20,000/ ton. Specific consumption of charge sinter in BF'ce is 1,300 kg/ton The yield of pig casting machine is 95% The ratio of charge sinter to product sinter is 90%.</p>	4+4+2
5	<p>Define reducibility of iron ore with expression . State how reducibility is influenced by different process parameters</p> <p style="text-align: center;">-or-</p> <p>a) Differentiate between Integrated Steel Plant and Mini Steel Plant Draw a process flowchart of mini steel plant via. Pellet-DR-EAF route producing billets</p> <p>b) What are the essential characteristics of iron ore for charging in the Blast Furnace (BF'ce) and how they influence the operation?</p>	4+16
		10