GOVERNMENT POLYTECHNIC JAJPUR

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DEPARTMENT OF METALLURGICAL ENGINEERING

LESSON PLAN

Discipline Metallurgy	Semester 4th	Name of teaching faculty: Biren Kumar Samal P.T.G.F in metallurgy
Subject P.E.M	No day/ week class: 4	No of week: 16 Session: summer 2022
Week	Class Day	Topic
1st	1st	Introduction class of metallurgical terms
	2nd	Ore, mineral with examples
	3rd	Define gangue, flux & slag
	4th	Matte and speciss
2nd	1st	Define metal and alloys
	2nd	Use of different metal and alloys
	3rd	Introduction principles of pre-treatment of ores
	4th	Short description different agglomeration process
3rd	1st	Introduction of sintering
	2nd	Principles and process variables of sintering with sketch
	3rd	Advantages and limitation of sintering
	4th	Introduction of Pelletizing
4th	1st	Theory of bonding in pellets
	2nd	Mechanisim of ball formation
	3rd	Disc pelletizer
	4th	Drum pelletizer, Flowsheet of pelletizing
5th	1st	Short notes on Briquetting, nodulising
	2nd	Introduction of general method of extraction
	3rd	Inroduction of Pyrometallurgy
	4th	Roasting and differnent roasting methods
6th	1st	Description of calcination with chemical reaction
	2nd	Smelting and types of smelting
	3rd	Matte smelting, reverberatory furnace sketch
	4th	Method of distillation and sublimation

7th	1st	Coverting process of matte and pig iron
	2nd	Hydrometallurgy and different steps
	3rd	Flow diagram of hydrometallurgical extraction
	4th	Leaching and different leaching method
8th	1st	Bacteria leaching
	2nd	Pressure leaching
	3rd	Electrometallugical process
	4th	Define electrolysis, ionic conductivity
9th	1st	Electromotive series
	2nd	Introduction of Faradays law of electrolysis
	3rd	First and second law of electrolysis
	4th	Difference between electro-wining and electro- refining
10th	1st	Zone refining
	2nd	Fire refining
	3rd	Principles of metallugical thermodynamics
	4th	Zeroth law of thermodynamics
11th	1st	First and second law of thermodynamics
	2nd	Third law of thermodynamics
	3rd	Concept of intrnal energy, Enthalpy
	4th	Concept of entopy change and free energy of a chemical reaction
12th	1st	Henry's law
	2nd	Sivert's law
	3rd	Explain order of reaction
	4th	Application of first order of reaction
13th	1st	Introduction of ellingham diagram
	2nd	Contruction of ellingham diagram
	3rd	Use of ellingham diagram
	4th	Objective question discussion
14th	1st	Introduction Predominance area diagram
	2nd	Method of contruction
	3rd	Utility of predominance area diagram (PAD)
	4th	Objective question discussion
15th	1st	Revision class of E.M.F series
	2nd	Application of E.M.F series
	3rd	Electrolysis with illustration of diagram

	4th	Reaction of electrolysis process
16th	1st	Hearth Smelting
	2nd	Electro-refining of Cu
	3rd	Objective question discussion
	4th	Assignment