

KIIT POLYTECHNIC, BHUBANESWAR

LESSON PLAN

Session: 2022-23

Discipline : Metallurgical Engineering	Semester:3rd, Winter/2022	Name of the Faculty:Manas Ranjan Behera Lecturer E-mail Id:mrbeherafmt@kp.kiit.ac.in
Subject:Fuels&Refractories(Th.3)	No. Of Days/Week:4	Start date:14/09/2022 End date :21/01/2023
Week	Class Day	Theory Topics
1st	1st	Definition of fuel and classification of fuel.
	2nd	Importance of solid and liquid fuels.
	3rd	Importance of gaseous fuels.
	4th	Description of different fuels and resources in India.
2nd	1st	Discussion on possible questionnaire.
	2nd	Explanation about origin of coal.
	3rd	Composition of coal and constituents of coal.
	4th	Characteristics and significance of constituents.
3rd	1st	Discussion about proximate analysis.
	2nd	Discussion about ultimate analysis.
	3rd	Distinguish between proximate and ultimate analysis.
	4th	Discussion about calorific value of coal.
4th	1st	Description about coking properties of coal.
	2nd	Description about swelling index of coal.
	3rd	Discussion about criteria of selection of metallurgical Coal.
	4th	Scope and objectives of carbonization of coal.
5th	1st	Explanation of carbonization of coal.
	2nd	Difference between high temperature carbonization and low temperature carbonization.
	3rd	Merits and demerits of H.T.C and L.T.C
	4th	Discussion about different test carried out for coke.
6th	1st	Discussion about Shatter and Micum index.
	2nd	Quiz test
	3rd	Discussion about origin of petroleum.

	4th	Discussion about constitution of petroleum.
7th	1st	Discussion about properties of petroleum products.
	2nd	Discussion about distillation process of crude petroleum.
	3rd	Description about production of coal tar.
	4th	Discussion about uses of coal tar.
8th	1st	Discussion on possible questionnaire.
	2nd	Definition of specific gravity, viscosity and cloud point.
	3rd	Definition of pour point and aniline point.
	4th	Definition of octane number and cetane number.
9th	1st	Discussion about method of testing of specific gravity and viscosity.
	2nd	Discussion about method of testing of flash point, cloud point and pour point.
	3rd	Discussion on possible questionnaire.
	4th	Explanation about gaseous fuels.
10th	1st	Production and utilization of methane gas and water gas.
	2nd	Production and utilization of producer gas and carburetted gas.
	3rd	Production and utilization of coke oven gas and blast furnace gas.
	4th	Production and utilization of natural gas and mixed gas.
11th	1st	Discussion on possible questionnaire.
	2nd	Discussion about elementary principle of combustion.
	3rd	Discussion about Hess's law of constant.
	4th	Discussion about Kirchhoff's law.
12th	1st	Simple combustion calculation.
	2nd	Quiz test
	3rd	Definition and classification of Refractories.
	4th	Explanation of desirable properties of Refractories.
13th	1st	Discussion about raw materials, methods of manufacturing and properties of silica and fire clay refractories.
	2nd	Discussion about raw materials, methods of manufacturing and properties of magnesia and dolomite

		refractories.
	3rd	Discussion about raw materials, methods of manufacturing and properties of chrome magnesite, graphite and carbon bricks.
	4th	Discussion on possible questionnaire.
14th	1st	Discussion about special refractories like high alumina, mullite, SIC and Zirconia.
	2nd	Criteria for selection and types of refractories selected for blast furnace.
	3rd	Criteria for selection and types of refractories selected for L.D, open hearth, arc furnace, ladle and soaking pit.
	4th	Criteria for selection and types of refractories selected for coke oven, reheating furnace, copper smelting flash
15th	1st	Discussion on previous year's question.
	2nd	Discussion on possible questionnaire.
	3rd	Practice test
	4th	Practice test

Recommended books: 1.Elements of Fuels, Furnaces and Refractories by R.C.Gupta

2. Refractories by M.L.Mishra

