GOVERNMENT POLYTECHNIC JAJPUR

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DEPARTMENT OF METALLURGICAL ENGINEERING

LESSON PLAN

Discipline: Metallurgy	Semester: 3rd	Name of teaching faculty: Smruti Sangita Sahu P.T.G.F in metallurgy
Subject: F&R	No day/ week class: 4	No of week: 16 Session: Winter 2024 Semester starts from Date :- 1/7/24 to Date :- 8/11/24
Week	**Class Day**	**Topic**
1st	1st	Fundamental concept of fuel with examples
	2nd	Show image of different fuel through slide presentation
	3rd	Classify the fuel with proper definition
	4th	Compare between Solid, Liquid and Gaseous fuels with examples day to day life importance of different fuel.
2nd	1st	Discuss fuels resources of india through image of india map
	2nd	Introduction of solid fuel with proper definition
	3rd	Expalin detail about coal formation with proper exmaples
	4th	Discuss small concept about origin of coal
3rd	1st	Coal composition with relation to the rank of coal
	2nd	Discuss the characteristics and significance constituents of coal Differentiate between proximate and ultimate analysis of coal
	3rd	Proximate anlysis i.e Volatile matter, Moisture content and Fixed carbon.
	4th	Calorific value of coal definition and its type.
4th	1st	Discuss the different coking properties of coal and swelling index
	2nd	Discuss the criteria of metallurgical coal and availability in india
	3rd	Detail explain Carbonization of coal, Physico-chemical changes during coal carbonisation.
	4th	Short description about different section of Coke oven with flow diagram.
5th	1st	Detail discussion of high temp carbonization(metallurgical coke production)
	2nd	Differentiate between H.T.C and L.T.C
	3rd	Merits and demerits of H.T.C and L.T.C
	4th	Elaborate taste carried out for coke(Shatter and Micum index)
6th	1st	Discussion of previous years semester question
	2nd	Oral test Assignment checking
	3rd	Class test-1

	4th	Introduction of liquid fuel with example
7th	1st	How to formation petroleum with example, Identify the location through indian map available of petroleum
	2nd	Origin of petroleum
	3rd	Discuss the properties of petroleum products
	4th	Sketch diagram of fractional distillation and describe process
8th	1st	Product of crude distillation and uses.
	2nd	Explain the production of coal tar and use
	3rd	Elaborate objective of liquid Fuels testing
	4th	Discuss the viscosity testing of liquid fuel
9th	1st	Compare between flash and fire point, Pensky-marten's method
	2nd	Dicuss the cloud and pour point with pouring apparatus
	3rd	Short describe about octane and cetane number
	4th	Benefit of different liquid fuel testing
10th	1st	Introduction Gaseous fuel and appropriate definition, natural gas
	2nd	Explain the water gas with diagram
	3rd	Explain the producer gas with diagram
	4th	Compare between water and producer gas
11th	1st	Coke oven gas, characteristics and uses
	2nd	B/F gas, characteristics and uses
	3rd	Compare between coke oven gas and blast furnace gas
	4th	Compare between solid, liquid and gaseous.
12th	1st	M.C.Q question test
	2nd	Oral test question liquid and gaseous fuel
	3rd	Revision and doubt clearing class
	4th	Class test-2
13th	1st	Discuss the elementary principle of combustion
	2nd	Hess's law of constant heat summation, Kirchoff's law.
	3rd	Basic concept of Refractories
	4th	Define and Classify Refractories
14th	1st	Explain the desirable properties of Refractories in details
	2nd	General method of refractory manufacture with flow diagram
	3rd	Discuss the raw material for refractory manufacture and properties of fire clay
	4th	Magnesia refractory and properties
15th	1st	Chrome magnesite refractory and properties
	2nd	Magnesia carbon bricks and properties
	3rd	Graphite refractory and properties

	3rd	
	4th	Dicuss the uses of different refractories
16th	1st	Special refractories like mullite, SIC,high alumina, zirconia
	2nd	Discuss refractory lining in different f/c
	3rd	Discussion previous years semester question
		Selection question given in exam point view
	4th	Internal Assessment

SSSahu 1/7/24

Signature of faculty