

RAJA KISHORE CHANDRA ACADEMY OF TECHNOLOGY**NILGIRI,BALASORE****DEPARTMENT OF MECHANICAL ENGINEERING****LESSON PLAN****SUBJECT-HM & IFP****BRANCH-MECHANICAL****NAME OF THE FACULTY- ER.NIMAIN PRASAD DHAMUDIA****SEMESTER-5TH**

LECTURE NO	DATE	MODULE	TOPICS TO BE COVERED
1		Unit 1	HYDRAULIC TURBINES : Definition of hydraulic turbine, difference between turbine and pump, and classification of turbines
2			General layout of a hydroelectric power plant , significance of specific speeds of turbine, definition of types heads
3			Construction and working principle of impulse turbinewith schematic diagram, advantages of Impulse turbine
4			Disadvantages of Impulse turbine and area of applications of Impulse turbine
5			Construction and working principle of Reaction turbine with schematic diagram, advantages of reaction turbine
6			Disadvantages of Reaction turbine and area of applications of Reaction turbine
7			Difference between impulse turbine and reaction turbine
8			Description on Pelton turbine, Velocity triangle forPelton turbine and work-done
9			Derivation of various efficiencies of Pelton turbine and Numerical
10			Description on Francis turbine, Velocity triangle for Francis turbine and work-done
11			Derivation of various efficiencies of Francis turbine and Numerical
12			Description on kaplan turbine, Velocity triangle for Kaplan turbine, work-done and derivation of various efficiencies of Kaplan turbine
13			Derivation of various efficiencies of Kaplan turbine and Numerical
14			CENTRIFUGAL PUMP: Introduction to Pumps, Classification of pump, Description of a Centrifugal pump
15			Constuction and working principle of Centrifugal pump

			along with diagram
16			Working of Centrifugal pump, Description on Multistage Centrifugal pump
17		Unit 2	Comparison between Centrifugal pump and Reciprocating pump
18			Priming of Centrifugal pump, Cavitation of Centrifugal pump, Work done by Centrifugal Pump
19			Head and Efficiency of Centrifugal Pump, Characteristic curves of Centrifugal pump
20			Net Positive suction head, Water hammer, Problems on Centrifugal pump
21			RECIPROCATING PUMP: Description of Reciprocating pump, Classification of Reciprocating pump
22			Description of Single Acting Reciprocating pump & Description of Double Acting Reciprocating pump
23			Advantages & Disadvantages of Reciprocating pump
24		UNIT-3	Definitions for Slip, Positive slip, Negative slip & Establishment of relation between Slip & Co-efficient of discharge
25			Expressions for discharge, work done, & power required for single acting reciprocating pump
26			Expressions for discharge, work done, & power required for double acting reciprocating pump
27			All numerical related to reciprocating pump
28			PNEUMATIC CONTROL SYSTEM- Major components/elements in a pneumatic control- Description of filter, function of filter, its construction & operation
29			Air compressor, Classification of compressor, description of Reciprocating piston compressor
30			Description of Diaphragm compressor, Rotary piston compressor, Screw compressor, Flow compressor
31		UNIT-4	Detailed description and functions of Inlet filters, Inter coolers, After coolers, Water-cooled after coolers
32			Detailed description and function of Air dryers, Description of Regulator
33			Function of Regulator, working operation of regulator, Types of pressure regulator,
34			Relieving or Venting type of pressure regulator, its working procedure, Non-relieving or Non-venting pressure regulator
35			Description of Air lubricator and Muffler, its function and working operation with a schematic diagram

36		UNIT-4	Detailed representation of FRL unit, its unit symbol, its function, Description of Pneumatic Actuator
37			Classification of Pneumatic actuator, a) Linear motion-single and double acting cylinder, b) Rotary motion- air motor and rotary actuator
38			Description of Single acting cylinder, Double acting cylinder and Reservoir/Air receiver with diagrams
39			Detailed description of Pressure Control Valves, Pressure Relief Valves.
40			Protection of Pneumatic system against low pressure, against over load, Description and principle of Pressure Regulation Valves
41			Description of Direction control valves, 3/2DCV, 5/2DCV, 5/3DCV Valve types, Common valve types
42			Description of Flow Control valve and Throttle valve Symbols of various elements in pneumatic control, Symbols of Pneumatic components
43			Direct control of single acting cylinder, Operation of Double acting cylinder,
44			Operation of double acting cylinder with metering-in and metering-out control & Meter-out circuit.
45		UNIT-5	HYDRAULIC CONTROL SYSTEM- Introduction to Hydraulic control system, Description of Fluid power system, Difference between Hydraulic systems and Mechanical systems
46			Advantages and disadvantages of Fluid power system, Area of applications of Fluid power.
47			Detailed description of Hydraulic accumulator, its effects in Dead weight loaded accumulator, Spring loaded accumulators and Air/gas accumulator
48			Functions of Accumulators, Introduction to pumps, Classifications of pumps, positive displacement pumps & rotodynamic pump.
49			Comparison between Positive displacement pumps and Centrifugal pumps, Description of External spur gear pump
50			Construction of External spur gear pump, Working operation and diagram of External spur gear pump
51			Construction of Internal Gear Crescent pump, Working operation and diagram of Internal Gear Crescent pump
52			Detailed description of Actuators and Cylinders, Classification of Hydraulic Actuator, Description of Single-acting cylinder along with a diagram of cross-sectional view of it
53			Description of Double-acting cylinder along with a diagram of cross-sectional view of it, Description of Telescopic cylinder, cross-sectional view diagram of it.

54		UNIT-5	Description of Single Acting Telescopic cylinder and Double Acting Telescopic cylinder, Description of Tandem Cylinder along with a diagram of cross-sectional view of it
55			Description of Pressure operated valves, Description of Pressure relief valves (PRV) along with both Direct acting relief valves and Balanced operated relief valves. Including all the diagram
56			Description of Pressure reducing valves, Direction control valves, Flow control valves and Throttle valves along with its diagrams.
57			Essential components of Hydraulic Circuit, Functions of each of the elements of Hydraulic circuit
58			Working principle of Hydraulic system, Description of Direct control of single-acting cylinder. Including its diagrams.
59			Operation of Double-acting cylinder with metering-in and metering-out control, its applications, drawbacks and schematic diagrams
60			Comparison between Hydraulic system and Pneumatic system
61			DOUBT CLEARING, QUESTION AND ANSWER DISCUSSION
62			DOUBT CLEARING, QUESTION AND ANSWER DISCUSSION
63			DOUBT CLEARING, QUESTION AND ANSWER DISCUSSION
64			DISCUSSION OF PREVIOUS SEMESTER QUESTIONS
65			CLASS TEST QUESTION DISCUSSION & DISTRIBUTION OF EVALUATED ANSWER SHEET TO THE STUDENT FOR THEIR REFERENCES
66			PREVIOUS SEMESTER QUESTION DISCUSSION

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SIGNATURE OF H.O.D

