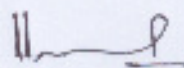


Discipline : <b>MECHANICAL ENGG</b>	Semester : <b>5th</b>	Name of the Teaching Faculty: <b>SUBHRANSU SEKHAR BARIK</b>
Subject: <b>HYDRAULIC MACHINES &amp; INDUSTRIAL FLUID POWER(Tb-3)</b>	No. of days/per week class allotted: <b>04</b>	Semester From date : <b>01.08.2023</b> To Date: <b>30.11.2023</b>  No. of Weeks: <b>15</b>
Week	Class Day	Theory / Practical Topics
1 <sup>ST</sup>	1 <sup>ST</sup>	<b>HYDRAULIC TURBINES.</b> Definition and classification of hydraulic turbines
	2 <sup>ND</sup>	Construction and working principle of impulse turbine
	3 <sup>RD</sup>	Construction and working principle of impulse turbine
	4 <sup>TH</sup>	Velocity diagram of moving blades, work done and derivation of various efficiencies of impulse turbine.
2 <sup>ND</sup>	1 <sup>ST</sup>	Velocity diagram of moving blades, work done and derivation of Various efficiencies of impulse turbine.
	2 <sup>ND</sup>	Velocity diagram of moving blades, work done and derivation of various efficiencies of Francis turbine.
	3 <sup>RD</sup>	Velocity diagram of moving blades, work done and derivation of various efficiencies of Francis turbine.
	4 <sup>TH</sup>	Velocity diagram of moving blades, work done and derivation of various efficiencies of Kaplan turbine
3 <sup>RD</sup>	1 <sup>ST</sup>	Velocity diagram of moving blades, work done and derivation of various efficiencies of Kaplan turbine
	2 <sup>ND</sup>	Numerical on above
	3 <sup>RD</sup>	Numerical on above
	4 <sup>TH</sup>	<b>CLASSTEST</b>
4 <sup>TH</sup>	1 <sup>ST</sup>	Numerical on above
	2 <sup>ND</sup>	Numerical on above
	3 <sup>RD</sup>	Distinguish between impulse turbine and reaction turbine
	4 <sup>TH</sup>	<b>CENTRIFUGAL PUMPS</b> Construction and working principle of centrifugal pumps.
5 <sup>TH</sup>	1 <sup>ST</sup>	work done and derivation of various efficiencies of centrifugal pumps
	2 <sup>ND</sup>	work done and derivation of various efficiencies of centrifugal pumps
	3 <sup>RD</sup>	Numerical on above
	4 <sup>TH</sup>	Numerical on above
6 <sup>TH</sup>	1 <sup>ST</sup>	<b>RECIPROCATING PUMPS</b> Describe construction & working of single acting reciprocating pump.
	2 <sup>ND</sup>	Describe construction & working of double acting reciprocating pump.
	3 <sup>RD</sup>	Derive the formula foe power required to drive the pump (Single acting & double acting).
	4 <sup>TH</sup>	Derive the formula foc power required to drive the pump (Single acting & double acting).
7 <sup>TH</sup>	1 <sup>ST</sup>	Define slip.
	2 <sup>ND</sup>	State positive & negative slip & establish relation between slip & coefficient of discharge.
	3 <sup>RD</sup>	State positive & negative slip & establish relation between Slip & coefficient of discharge.
	4 <sup>TH</sup>	Solve numerical on above

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8 <sup>TH</sup>	1 <sup>ST</sup>	Solve numerical on above
	2 <sup>ND</sup>	CLASS TEST
	3 <sup>RD</sup>	<b>PNEUMATIC CONTROL SYSTEM</b> Elements –filter-regulator-lubrication unit
	4 <sup>TH</sup>	Pressure control valves
9 <sup>TH</sup>	1 <sup>ST</sup>	Pressure relief valves
	2 <sup>ND</sup>	Pressure regulation valves
	3 <sup>RD</sup>	Direction control valves 3/2DCV,5/2 DCV,5/3DCV
	4 <sup>TH</sup>	Direction control valves 3/2DCV,5/2 DCV,5/3DCV
10 <sup>TH</sup>	1 <sup>ST</sup>	Direction control valves 3/2DCV,5/2 DCV,5/3DCV
	2 <sup>ND</sup>	Flow control valves
	3 <sup>RD</sup>	Throttle valves
	4 <sup>TH</sup>	ISO Symbols of pneumatic components
11 <sup>TH</sup>	1 <sup>ST</sup>	Pneumatic circuit Direct control of single acting cylinder
	2 <sup>ND</sup>	Operation of double acting cylinder
	3 <sup>RD</sup>	Operation of double acting cylinder with metering in and metering out control
	4 <sup>TH</sup>	Operation of double acting cylinder with metering in and metering out control
12 <sup>TH</sup>	1 <sup>ST</sup>	Operation of double acting cylinder with metering in and metering out control
	2 <sup>ND</sup>	<b>HYDRAULIC CONTROL SYSTEM</b> Hydraulic system, its merit and demerits.
	3 <sup>RD</sup>	Hydraulic accumulators
	4 <sup>TH</sup>	Pressure relief valves
13 <sup>TH</sup>	1 <sup>ST</sup>	Pressure control valves.
	2 <sup>ND</sup>	Pressure regulation valves.
	3 <sup>RD</sup>	Direction control valves 3/2 DCV,5/2 DCV,5/3DCV.
	4 <sup>TH</sup>	Direction control valves 3/2 DCV,5/2 DCV,5/3DCV..
14 <sup>TH</sup>	1 <sup>ST</sup>	Fluid power pumps, External and internal gear pumps Vane pump Radial piston pumps.
	2 <sup>ND</sup>	ISO Symbols for hydraulic components.
	3 <sup>RD</sup>	Actuators
	4 <sup>TH</sup>	Hydraulic circuits. Direct control of single acting cylinder.
15 <sup>TH</sup>	1 <sup>ST</sup>	Operation of double acting cylinder.
	2 <sup>ND</sup>	Operation of double acting cylinder with metering in and metering Out control.
	3 <sup>RD</sup>	Operation of double acting cylinder with metering in and metering Out control. Comparison of hydraulic and pneumatic system
	4 <sup>TH</sup>	CLASS TEST

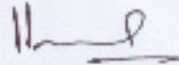
  
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**Learning Resources:**

01. Hydraulic Machines By Dr.Jagdish Lal , Metropolitan book Co
02. Hydraulics By Andrew
03. Hydraulic &Pneumatic Control By K Shanmuga,Sundaram, S.Chand
04. Hydraulic &Pneumatic Control By Majumdar , Tmh
05. Fluid Power Control By J.F. Blackburn,G.Reethof&J.Lshearer

  
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