GOVT. POLYTECHNIC, NAYAGARH

3rd SEMESTER MECHANICAL ENGINEERING (2022-23)

SUBJECT- THERMAL ENGINEERING-I **TOTAL PERIOD-60**

NAME OF FACULTY: Prafulla Kumar Mallick,PTGF(Mech) **THEORY-4P/WEEK**

Sl No.	week	Day	Topics to be covered
1	1st	1st day	Thermodynamic Systems (closed, open, isolated)
		2nd day	Thermodynamic properties of a system (pressure, volume, temperature, entropy, enthalpy, Internal energy and units of measurement).
		3rd day	Intensive and extensive properties
		4th day	Define thermodynamic processes, path, cycle , state, path function, point function &Thermodynamic Equilibrium.
Sl No.	**week**	**Day**	**Topics to be covered**
2	2nd	1st day	Work , heat and comparison between the two
		2nd day	Mechanical Equivalent of Heat.
		3rd day	Work transfer, Displacement work
		4th day	State & explain Zeroth law of thermodynamics
Sl No.	**week**	**Day**	**Topics to be covered**
3	3rd	1st day	State & explain First law of thermodynamics
		2nd day	Limitations of First law of thermodynamics
		3rd day	Application of First law of Thermodynamics (steady flow energy equation and its application to turbine and compressor)
		4th day	Second law of thermodynamics (Claucius & Kelvin Plank statements)
Sl No.	**week**	**Day**	**Topics to be covered**
4	4th	1st day	Application of second law in heat engine, heat pump, refrigerator & determination of efficiencies & C.O.P
		2nd day	solve simple numerical)
		3rd day	solve simple numerical)
		4th day	Numerical on above
Sl No.	**week**	**Day**	**Topics to be covered**
5	5th	1st day	Laws of perfect gas:
		2nd day	Boyle's law, Charle's law, Avogadro's law, Dalton's law of partial pressure, Guy lussac law, General gas equation, characteristic gas constant, Universal gas constant
		3rd day	Explain specific heat of gas (Cp and Cv)
		4th day	Relation between Cp & Cv.
Sl No.	**week**	**Day**	**Topics to be covered**

6	6th	1st day	Work done during a non- flow process
		2nd day	Application of first law of thermodynamics to various non flow process (Isothermal, Isobaric, Isentropic and polytrophic process
		3rd day	Solve simple problems on above.
		4th day	Free expansion & throttling process.
Sl No.	**week**	**Day**	**Topics to be covered**
7	7th	1st day	Explain & classify I.C engine
		2nd day	Terminology of I.C Engine such as bore, dead centers, stroke volume, piston speed &RPM.
		3rd day	Explain the working principle of 2-stroke & 4- stroke engine C.I & S.I engine.
		4th day	Differentiate between 2-stroke & 4- stroke engine C.I & S.I engine.
Sl No.	**week**	**Day**	**Topics to be covered**
8	8th	1st day	Gas Power Cycle
		2nd day	Carnot cycle
		3rd day	Otto cycle.
		4th day	Diesel cycle
Sl No.	**week**	**Day**	**Topics to be covered**
9	9th	1st day	Dual cycle
		2nd day	Solve simple numerical.
		3rd day	Solve simple numerical.
		4th day	Solve simple numerical.
Sl No.	**week**	**Day**	**Topics to be covered**
10	10th	1st day	Fuels and Combustion
		2nd day	Define Fuel
		3rd day	Types of fuel.
		4th day	Application of different types of fuel
Sl No.	**week**	**Day**	**Topics to be covered**
11	11th	1st day	Heating values of fuel.
		2nd day	Quality of I.C engine fuels Octane number
		3rd day	Quality of I.C engine fuels Octane number
		4th day	Numerical problems on above
Sl No.	**week**	**Day**	**Topics to be covered**

12	12th	1st day	Numerical problems on above
		2nd day	Numerical problems on above
		3rd day	Numerical problems on above
		4th day	
Sl No.	**week**	**Day**	**Topics to be covered**
13	13th	1st day	Numerical problems on above
		2nd day	Numerical problems on above
		3rd day	Numerical problems on above
		4th day	Numerical problems on above
Sl No.	**week**	**Day**	**Topics to be covered**
14	14th	1st day	Numerical problems on above
		2nd day	Numerical problems on above
		3rd day	Numerical problems on above
		4th day	Numerical problems on above
Sl No.	**week**	**Day**	**Topics to be covered**
15	15th	1st day	Numericals problem solving
		2nd day	Numericals problem solving
		3rd day	Doubt clearance and Revision
		4th day	Doubt clearance and Revision