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| **BIT POLYTECHNIC BALASORE** | | |
| **DEPARTMENT OF MECHANICAL ENGINEERING** | | |
| **LESSON PLAN** | | |
| **Discipline:**  **Mechanical** | **Semester: 4th** | **Name of the Teaching faculty: ER BIBATSA KUMAR PANDA** |
| **Subject: Thermal Engineering- II** | **No of Days/Week class alloted: 4** | **Semester: 4TH from Date: 16.01.2024 To Date: 26.04.2024 No of weeks: 13** |
| **Week** | **Class Day** | **Topics** |
| 1st | 1st | **CHAPTER-1 (Performance of I.C engine)**  1.1 Define mechanical efficiency, Indicated thermal efficiency, Relative Efficiency, brake thermal efficiency overall efficiency Mean effective pressure &specific fuel consumption. |
| 2nd | 1.1 Define mechanical efficiency, Indicated thermal efficiency, Relative Efficiency, brake thermal efficiency overall efficiency Mean effective pressure &specific fuel consumption. |
| 3rd | 1.2 Define air-fuel ratio & calorific value of fuel. |
| 4th | 1.3 Work out problems to determine efficiencies & specific fuel consumption. |
| 2nd | 1st | 1.3 Work out problems to determine efficiencies & specific fuel consumption. |
| 2nd | **CHAPTER-2(Air Compressor)**  2.1 Explain functions of compressor & industrial use of compressor air |
| 3rd | 2.2 Classify air compressor & principle of operation. |
| 4th | 2.3 Describe the parts and working principle of reciprocating Air compressor. |
| 3rd | 1st | 2.4 Explain the terminology of reciprocating compressor such as bore, stroke,  pressure ratio free air delivered &Volumetric efficiency. |
| 2nd | 2.5 Derive the work done of single stage & two stage compressor with and without clearance. |
| 3rd | 2.5 Derive the work done of single stage & two stage compressor with and without clearance. |
| 4th | 2.6 Solve simple problems (without clearance only) |
| 4th | 1st | 2.6 Solve simple problems (without clearance only) |
| 2nd | Revison and Doubt session of chapter-1,2 |
| 3rd | Revison and Doubt session of chapter-1,2 |
| 4th | **CHAPTER-3 (Properties of Steam)**  3.1 Difference between gas & vapours. |
| 5th | 1st | 3.2 Formation of steam. |
| 2nd | 3.3 Representation on P-V, T-S, H-S, & T-H diagram. |

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|  | 3rd | 3.4 Definition & Properties of Steam. |
| 4th | 3.5 Use of steam table & mollier chart for finding unknown properties. |
| 6th | 1st | 3.6 Non flow & flow process of vapour. |
| 2nd | 3.7 P-V, T-S & H-S, diagram. |
| 3rd | 3.8 Determine the changes in properties & solve simple numerical. |
| 4th | 3.8 Determine the changes in properties & solve simple numerical. |
| 7th | 1st | **CHAPTER-4 (Steam Generator)** |
| 2nd | 4.1 Classification & types of Boiler. |
| 3rd | 4.2 Important terms for Boiler. |
| 4th | 4.3 Comparison between fire tube & Water tube Boiler |
| 8th | 1st | 4.4 Description & working of common boilers (Cochran, Lancashire, Babcock & Wilcox Boiler) |
| 2nd | 4.5 Boiler Draught (Forced, induced & balanced) |
| 3rd | 4.6 Boiler mountings & accessories. |
| 4th | Revision and Doubt clearing session of chapter-3,4 |
| 9th | 1st | **CHAPTER-5 (Steam Power Cycles)**  5.1 Carnot cycle with vapour. |
| 2nd | 5.2 Derive work & efficiency of the cycle. |
| 3rd | 5.3 Rankine cycle |
| 4th | 5.3.1 Representation in P-V, T-S & h-s diagram. |
| 10th | 1st | 5.3.2 Derive Work & Efficiency. |
| 2nd | 5.3.3 Effect of Various end conditions in Rankine cycle |
| 3rd | 5.3.4 Reheat cycle & regenerative Cycle. |
| 4th | 5.4 Solve simple numerical on Carnot vapour Cycle & Rankine Cycle. |
| 11th | 1st | **CHAPTER-6 (Heat Transfer)**  6.1 Modes of Heat Transfer (Conduction, Convection, Radiation). |
| 2nd | 6.2 Fourier law of heat conduction and thermal conductivity (k). |
| 3rd | 6.3 Newton’s laws of cooling. |
| 4th | 6.4 Radiation heat transfer (Stefan, Boltzmann & Kirchhoff’s law) only  statement, no derivation & no numerical problem. |

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| 12th | 1st | 6.5 Black body Radiation, Definition of Emissivity, absorptivity, &  transmissibility. |
| 2nd | Revision and Doubt clearing session of chapter-5,6 |
| 3rd | Revision and Doubt clearing session of chapter-1,2,3 |
| 4th | Revision and Doubt clearing session of chapter-4,5,6 |
| 13th | 1st | Previous year question discussion |
| 2nd | Previous year question discussion |
| 3rd | Previous year question discussion |
| 4th | Previous year question discussion |