GANDHI ACADEMY OF TECHNOLOGY AND ENGINEERING

Department of Mechanical Engineering

**LESSON PLAN**

**SESSION- 2023-24**

|  |  |  |  |
| --- | --- | --- | --- |
| **Subject** | **Power Station Engineering** | | |
| **Branch** | **Mechanical Engineering** | **Name of the Faculty** | **Mr. Sovan Kumar Behera** |
| **Course Code** | **Th-3** | **Semester** | **6th Semester** |
| **Total Periods** | **60** | **Examination** | **2023-24** |
| **Theory Period** | **4P/ W** | **Class Test** | **20** Marks |
| **Maximum Marks** | **100 Marks** | **End Semester Examination** | **80** Marks |

|  |  |  |
| --- | --- | --- |
| **Week** | **Class Day** | **Theory/Practical Topics** |
| 1st | 1st | Different sources of energy. Introduction to Power Plants. Classification of power plants. |
| 2nd | Concept of Central and Captive power station. Importance of electrical power in day today life. |
| 3rd | Variousmethodsofelectricalpowergeneration |
| 4th | Layoutofsteampowerstation |
| 2nd | 1st | ExplanationsofCarnotvapourpowercyclewithP-V,T-sdiagramand determination of thermal efficiency. |
| 2nd | NumericalonCarnotvapourpower cycle |
| 3rd | ExplanationsofRankinecyclewithP-V,T-sandH-sdiagramandstudy of performance of steam power plant |
| 4th | Determinationofthermalefficiency,workdone,workratio,andspecific steam Consumption for Rankine cycle |
| 3rd | 1st | NumericalonRankinecycle |
| 2nd | Boiler–itsfunction,typesandoperation |
| 3rd | Boilermountings–need,typesandtheirfunctions |
| 4th | BoilerAccessories:OperationofAirpreheater,Economiser,superheater, Electrostatic precipitator |
| 4th | 1st | Steamprimemovers:Advantages&disadvantagesofsteamturbine, Elements of steam turbine, Classification |
| 2nd | Workingofsteamturbines.Performanceofsteamturbine–Explain Thermal efficiency, Stage efficiency and Gross efficiency. |
| 3rd | Governingofsteamturbine. |
| 4th | Steamcondenser:Functionofcondenser,Classificationofcondenser. |
| 5th | 1st | Functionofcondenserauxiliariessuchashotwell,condenserextraction pump, air extraction pump, and circulating pump. |

|  |  |  |
| --- | --- | --- |
|  | 2nd | CoolingTower:Functionandtypesofcoolingtower,andsprayponds |
| 3rd | Draughtsystems(Naturaldraught,Forceddraught&balanceddraught) with their advantages & disadvantages |
| 4th | Selectionofsiteforthermalpowerstations.Listofthermalpowerstations in the state with their capacities |
| 6th | 1st | *ClassTest,Assignment-1* |
| 2nd | *DoubtClearingClass* |
| 3rd | *DoubtClearingClass* |
| 4th | *QUIZTest-1* |
| 7th | 1st | Introduction to Nuclear Power plant. Classification of nuclear fuels  (Fissile&fertilematerial).FusionandFissionreactions.Nuclearenergy. |
| 2nd | Elementsofnuclearpowerplants&Block diagram,Working |
| 3rd | Workingandconstructionofnuclearreactor |
| 4th | Listofnuclearpowerstations.Comparethenuclearandthermal plants. |
| 8th | 1st | Explainthedisposalofnuclearwaste.Selectionofsitefornuclearpower stations |
| 2nd | Introductiontodieselelectricpowerstations.Advantagesand disadvantages  of diesel electric power stations. |
| 3rd | Componentsofdieselelectricpowerstations. |
| 4th | Fuelstorageandfuelsupplysystem,Fuelinjectionsystem |
| 9th | 1st | Airsupplysystem,ExhaustsystemandStartingsystem |
| 2nd | Coolingandlubricationsystem |
| 3rd | Governingsystem.Selectionofsitefordieselelectricpower stations |
| 4th | Performanceandthermalefficiencyofdieselelectricpowerstations |
| 10th | 1st | Numerical |
| 2nd | *DoubtClearingClass* |
| 3rd | Introductiontohydroelectricpowerplantanditsadvantagesand disadvantages. |
| 4th | Generalarrangementofstoragetypehydroelectricprojectandits operation. |
| 11th | 1st | Selectionofsiteofhydelpowerplant |
| 2nd | Listofhydropowerstationswiththeircapacitiesandnumberofunitsin the state |
| 3rd | Typesofhydro-turbinesandgenerator used |
| 4th | Introductiontogasturbinepowerstation.Merits,demeritsandapplication of gas  turbine power plants |
| 12th | 1st | Fuelsforgasturbine.Selectionofsiteforgasturbinestations |
| 2nd | Elementsofsimplegasturbinepowerplants,Working |
| 3rd | *ClassTest,Assignment-2* |
| 4th | *DoubtClearingClass* |
| 13th | 1st | *DoubtClearingClass* |
| 2nd | *QuizTest-2* |
| 3rd | Revision–Chapter-1 |
| 4th | Revision–Chapter-2 |

|  |  |  |
| --- | --- | --- |
| 14th | 1st | Revision–Chapter-3 |
| 2nd | Revision–Chapter-4 |
| 3rd | Revision–Chapter-5 |
| 4th | Revision–Chapter-6 |