

Teaching Report

2021-2022

DEPARTMENT OF PHYSICS

SEM II

F.Y.B.Sc.

Name: Mr. Barne N.D.

PHY-121 Heat and Thermodynamics

Months	Topic taken	Periods
18 Apr.2022- 26 Apr. 2022	1. Fundamentals of Thermodynamics Concept of thermodynamic state, Equation of state, Van der Waal's equation of state, Thermal equilibrium, Zeroth law of thermodynamics, Thermodynamic processes: Adiabatic, Isothermal, Isobaric and Isochoric changes, Indicator diagram, Work done during isothermal change, Adiabatic relations, Work done during adiabatic change, Internal energy, Internal energy as state function, First law of thermodynamics, Reversible and Irreversible changes, Problems.	10
27 Apr. 2022-09 May 2022	2. Applied Thermodynamics Conversion of heat into work and its converse, Second law of thermodynamics, Concept of entropy, Temperature - entropy diagram, T-dS equations, Clausius - Clapeyron latent heat equations, Problems.	09
	Unit Test	
10 May 2022- 23 May 2022	3. Heat Transfer Mechanisms Carnot's cycle and Carnot's heat engine and its efficiency, Heat Engines: Otto cycle & its efficiency, Diesel cycle & its efficiency, Refrigerators: General principle and coefficient of performance of refrigerator, Simple structure of Vapor compression refrigerator, Air Conditioning: Principle and its applications, Problems	09
17 May 2022	INTERNAL EXAM	

24 May 2022-26 May 2022	4. Thermometry Concept of heat & temperature, Principle of thermometry, Temperature scales & inter-conversions, Principle, Construction and Working: (Liquid thermometers, Liquid filled thermometers, Gas filled thermometers, Bimetallic thermometers, Platinum resistance thermometer, Thermocouple), Problems	08
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2021-2022

DEPARTMENT OF PHYSICS

SEM VI

T.Y.B.Sc.

Name: Mr. Barne N.D. PHY-365 (A): Electronics-II

Months	Topic taken	Periods
26 March2022- 11 Apr. 2022	1: Semiconductor Devices: a. LED and Photodiode, Optocoupler. (Working Principles) Problems. Ref. 1. b. BJT: Transistor amplifier classifications - Class A, B, C and AB (working only), Differential amplifier (transistorized), Problems. Ref. 1. c. Field Effect Transistor: JFET (Introduction, classification, principle, working and IV characteristics) MOSFETs (DE-MOSFET and E only MOSFET). Problems.	09
12Apr.2022- 15 Apr. 2022	2: Applications of Semiconductor Devices: a. Three Pin Regulators: Block diagram of 3-pin IC regulator, study of IC-78XX, 79XX. Dual Power Supply using IC-78XX, 79XX. Ref. 1 b. Switching Regulators (SMPS): Introduction, Block diagram, Advantages and Disadvantages. Ref. 4 c. Modulation and Demodulation : Concept of Carrier Wave, Need of Modulation and Demodulation, Methods of Modulation like AM, FM, PM (Concepts Only), d. Concept of Modulation Index, Upper and Lower Side Band Frequencies in AM. Problems	09
16 Apr. 2022- 21 Apr.2022	3: Integrated Circuits: a. Integrated Circuits: Introduction, Scale of Integration, Advantages and drawbacks of IC Ref.4 b. OP-AMP Applications as Integrator, Differentiator, Comparator. Ref. 1 c. Timer IC-555: Block diagram, Astable, monostable multivibrator (working and design). Problems	09

19 May 2022	INTERNAL EXAM	
22 Apr.2022-13 May 2022	<p>4: Combinational and Sequential Circuits:</p> <p>a. Combinational Circuits: Introduction to SOP and POS equation. Concept of Standard SOP and POS equation. Concept of K-map and their use in reduction of Boolean expressions, design of half adder, full adder, half subtract, Study of binary to gray and gray to binary code conversion. Problems. Ref. 2</p> <p>b. Sequential Circuits: RS flip flop using NAND/NOR, clocked RS, D, JK and T-flip flops. Application of flip flops in Sequential Circuits as Counters and Registers. Asynchronous and Synchronous Counters. (3-bit Counter), Shift Registers and their types of operation -SISO, SIPO, PISO, PIPO (Concepts only).</p>	09

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DEPARTMENT OF PHYSICS

SEM VI

T.Y.B.Sc.

Name: Mr. Barne N.D. PHY-3610 SEC (Z): Calibration Techniques

Months	Topic taken	Periods
26 March 2022-07 Apr. 2022	Unit-1: Principles of Calibration 1. Introduction and Importance of Calibration 2. Traceability in Calibration 3. Calibration Uncertainty 4. Various Calibration Methods 5. Factors Affect Calibration 6. Instrument Classification and Instrument Identification	04
08 Apr. 2022-13 Apr. 2022	Unit-2: Pressure Calibration 1. Introduction to pressure calibration 2. Pressure unit conversion standards 3. Types of Pressure Gauges 4. Calibration of Pressure Gauges a. Accuracy b. Pressure Media c. Contamination d. Height Difference e. Leak test of Piping f. Adiabatic Effect g. Torque Force h. Calibration Position i. Generating Pressure j. Pressurizing the Gauge k. Reading the Pressure Value l. Number of Calibration Points m. Hysteresis (deviation of calibration points) n. Number of Calibration cycles 5. Instruments required for calibration:	06

	<ul style="list-style-type: none"> a. Pressure comparator b. Master Gauge <p>6. Pressure Calibration with Example</p>	
<p>14 Apr.2022- 18 Apr. 2022</p>	<p>Unit-3: Calibration of Electronic Instruments</p> <ul style="list-style-type: none"> 1. Identification of Components 2. Equipment required for calibration 3. Procedure of Calibration <ul style="list-style-type: none"> a. Read operational Specifications b. Sequence of events c. Identification of common Faults 4. Electronic Calibration with Examples (Oscilloscopes, Multimeters, Function Generators, Signal Generators) 	04
<p>23 May 2022</p>	<p>INTERNAL EXAM</p>	
<p>19 Apr. 2022-23 Apr. 2022</p>	<p>Unit-4: Temperature Calibration</p> <ul style="list-style-type: none"> 1. Temperature units and Conversions 2. Temperature Sensors 3. Calibration of temperature sensors <ul style="list-style-type: none"> a. Handling temperature sensor b. Preparations c. Temperature sources d. Reference Temperature Sensor e. Immersion Depth f. Stabilization g. Temperature sensor handle h. Calibrated temperature range i. Calibration Points j. Adjusting/trimming a temperature sensor 4. Examples: 	04

19May 2022 –24 May 2022	Activity: <ol style="list-style-type: none">1. RTD calibration check2. Calibration of digital balance3. Calibration of PH/Conductivity meter4. Calibration of Volt meter5. Calibration of Current meter6. Calibration of Oscilloscopes	18
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