

BHAKTA KAVI NARSINH MEHTA

UNIVERSIT JUNAGADH



Syllabus for the Subject of

PHYSICS

Under the Faculty of SCIENCE

B.Sc.-Sem: 2 (Physics)

In force from June - 2018.

B.Sc. Semester -2
P-201 : Physics Theory

(In force from June-2018)

(Wave, Optics & Semiconductor Devices)

60 hour 70 marks

UNIT -1: (12 hour: 14 Mark)

Wave Motion and Waves in a String: Wave motion, Transverse Wave Travelling in String, Velocity of a Wave in a String, Interference and the principle of Superposition, Standing waves on a String, Normal Modes of a String, Laws of Transverse Vibrations of a String.

Sound: Speed of Sound Wave in a material medium, Speed of Sound in Gas-Newton's Formula and Laplace's Correction, Intensity and loudness of Sound Wave - Decibels, Beats, Musical Scale, Acoustics of Buildings, Application of Acoustic phenomena, Doppler Effect.

Reference books:

1. Concept of physics By H C Verma part 1 Publisher: Bharati Bhawan
2. Sears and Zemansky's University Physics with modern physics
By H D Young Publisher: PEARSON

UNIT -2: (12 hour: 14 Mark)

Semiconductor Diode: Use of Diode in Rectifiers, Half-Wave Rectifier, Full-Wave Rectifier, Centre-tap Rectifier, Bridge Rectifier, Performance of Half-Wave & Full-Wave Rectifier (Rms value of current, Ripple factor, Rectification Efficiency), Comparison of Rectifiers, Filter Circuit, Capacitor Filter, Inductor

Filter, LC filter, π Filter, Review of Zener diode, Zener Diode as Voltage Regulator.

Transistor: Structure of Transistor, Types of BJT, Action of a Transistor, Working of a Transistor, Relation Between Different Current in Transistor, Three Configurations of Transistor, Transistor Characteristics (CB and CE Configuration), Comparison between the three configurations, Why CE Configuration is preferred in Circuit.

Reference books:

1. Basic electronics and linear circuits By N NBhargava, D C Kushreshtha & S C Gupta , Publisher: Technical Teachers Training Institute Chandigarh.
2. Elements of Electronics By Bagde & Singh Publisher :S.chand
3. Principles of electronics By V.K.Mehta Publisher: S.Chand 4.
4. Electronic Device And Circuits By Allen Mottershead Pub: PHI

UNIT -3: (12 hour: 14 Mark)

Wave Optics: Interference: Electromagnetic nature of Light, Wave Front, Huygens Principle. Superposition of Waves, Conditions for Interference, Techniques of Obtaining Interference: Division of Amplitude and Division of Wave front, Young's Double Slit Experiment, Lloyd's Single Mirror-Determination of Wavelength of Light, Fresnel Biprism – Experiment Arrangement & Determination of Wavelength of Light, Interference in Thin Films, Types of thin film –Parallel and wedge-shaped films, Newton's Rings: Determination of Wavelength of Light & refractive index.

UNIT -4: (12 hour: 14 Mark)

Wave Optics: Diffraction: Types of Diffraction-Fraunhofer and Fresnel Diffraction, Fraunhofer Diffraction at single slit, Fraunhofer Diffraction at Double Slit, Plane Diffraction Grating, Fraunhofer Diffraction at Plane Diffraction Grating. Rectilinear Propagation of Light and Half-Period Zones, Zone Plate, Action of Zone Plate, Comparison Between Zone Plate and Convex Lens, Diffraction Pattern of a straight edge.

UNIT -5: (12 hour: 14 Mark)

Electrostatics: Electrostatic Field, Electric Flux, Gauss's theorem of Electrostatics, Application of Gauss Theorem-Electric field due to point charge, Infinite Line of Charge, Uniformly Charged Spherical Shell and Solid Sphere, Plane Charged Sheet, Charged Conductor.

Electromagnetic Induction: Faraday's Laws of Electromagnetic Induction, Lenz's Law, Self and Mutual Inductance, L of Single Coil, M of Two Coils, Energy Stored in Magnetic Field.

Reference Books for unit 3,4,5 :

1. A Text Book Of OPTICS By N.Subrahmanyam, Brijlal, M.N. Avadhanulu
Publisher: S.chand.
2. Principle of OPTICS By B.K.Mathur Publisher: Gopal Printing
3. Fundamentals of OPTICS By Jenkins and White Publisher: McGraw-Hill
4. Fundamentals of OPTICS By Gulati and Khanna Publisher: R.Chand
5. Introduction to Electrodynamics By D. J. Griffiths
6. Electricity and Magnetism By D.C. Tayal

LIST OF EXPERIMENTS

B.Sc. Semester-II

1. To determine the unknown frequency of Tuning Fork By Melde' s Experiment
2. To Verify the Laws of vibrating strings by Melde's Experiment.
3. To Study the Resonator and to determine unknown frequency of tuning fork.
4. To Calibrate a Spectrometer.
5. To Study Dispersive curve, and to determine the dispersive power of the material of a prism for different colours.
6. To determine wavelength of light using Newton's Ring.
7. To study the CB Characteristic of Transistor.
8. To study the CE Characteristic of Transistor.
9. To study Half-Wave Rectifier.
10. To study Full-Wave Rectifier (Centre tap).
11. To study Bridge Rectifier.
12. To Study of a Transformer.
13. To study Characteristics of Photo diode.
14. To study Deflection magneto meter (one magnet and two magnets).

Reference Books:

1. B.Sc. Practical physics By C.L.Arora Pub: S.chand
2. A text book of Practical Physics ByInduPrakash&Ramkrishna Pub: KitabMahal, New Delhi.
3. Practical Physics ByS.L.Gupta and V. Kumar Pub: PragatiPrakashan, Meerut.
4. B.SarafetaI-Physics through experiments Vol. I & II

B.Sc. (Physics)
Semester -I to VI
Paper: Physics-401

Course duration: Theory: 60 hours, 6 hours a week, Credit: 4
Practical: 60 hours, 6 hours a week, Credit: 3
Theory: External Marks: 70, Internal Marks: 30, Total: 100
Practical: External Marks: 35, Internal Marks: 15, Total: 50

PAPER STYLE ALL SEMESTERS

1. B. Sc. Physics Syllabus for Semester 4 consists of 5 units:
2. All units carry 14 marks
3. Total 5 questions one question from each unit.
4. Each question of 14 mark
5. Time duration: 2.30 Hours

Question:1 from Unit 1 : Mark 14
Question:2 from Unit 2 : Mark 14
Question:3 from Unit 3 : Mark 14
Question:4 from Unit 4 : Mark 14
Question:5 from Unit 5: Mark 14

Each question should be divided in a and b sub questions as shown below.

(a) Answer the following questions (any two out of three) [10 Marks]

(b) Answer the following questions (any one out of two) [04 Marks]
(Application / Example / Problem / Theory)
