BHAKTA KAVI NARSINH MEHTA UNIVERSIT, JUNAGADH

Syllabus for the Subject of PHYSICS

under the Faculty of SCIENCE

B.Sc.-Sem: 1

(Physics)

Effective from June - 2018.

B.Sc. Semester -1
P-101 : Physics Theory
(In force from June-2018)
(Mechanics & Semiconductor Electronics)

60 hour   **70 Marks**

UNIT 1: (12 hour : 14 Mark)

Vectors algebra : Vectors and Scalars, Scalar and Vector Products (for 2 & 3 vectors), derivative of a vector with respect to parameter

Special theory of relativity: Constancy of speed of light, postulates of special theory of relativity, length contraction, time dilation, relativistic addition of velocities

UNIT 2: (12 hour : 14 Mark

Semiconductors Physics: Semiconductor materials, Energy Bands in solidsmetals

Insulators and semiconductor, Intrinsic Semiconductor, Crystal Structure

of Intrinsic semiconductor, Charge Carriers in Intrinsic semiconductor,

Conduction in Intrinsic semiconductor, Extrinsic semiconductors, N-type

Semiconductor, P-type Semiconductor, Effect of temperature on conductivity of

Intrinsic and Extrinsic Semiconductor, PN junction, Formation of PN junction, PN

junction with Forward and Reverse biasing, Reverse Breakdown, V-I

Characteristic of a PN junction diode, The ideal diode, Static and Dynamics

Resistance of a diode.Zener Diode, Zener Breakdown, V-I Characteristic of a

Zener diode, Numerical Examples.

Reference books for unit 1,2 :

1. Concept of physics By H C Verma part 1 Publisher: BharatiBhawan

2. Sears and Zemansky's University Physics with modern physics

By H D Young Publisher: PEARSON

3. Basic electronics and linear circuits By N NBhargavA, D C Kushreshtha,

S C Gupta Publisher: Technical Teachers Training Institute Chandigarh.

4. Elements of Electronics ByBagde& Singh Pub: S.chand

UNIT 3: (12 hour : 14 Mark)

Laws of Motion & Dynamics of System of Particles: Frames of reference, Newton's Laws of motion, Kinetic Energy, Work and Work-Energy theorem, Calculation of Work Done, Conservative and Non-Conservative force (only definition), Potential Energy and Conservation of Energy, Definition of Center of Mass, Center of Mass of Two Particles and several group of Particles, Linear Momentum and its Conservation Principle,

Rotational Motion: Angular velocity and Angular Acceleration, Torque of a Force about the Axis of Rotation, Moment of Inertia and $\tau = I\alpha$, Moment of Inertia of rectangular Bar, Moment of Inertia of Solid Cylinder, Angular Momentum, Conservation of angular momentum

UNIT 4: (12 hour : 14 Mark)

Gravitation: Newton's Law of Gravitation, Gravitation Potential Energy, Gravitation potential, Gravitational field, Calculation of Gravitational Potential and Field due to a Point Mass, Kepler's Laws, Motion of Planets and Satellite in circular orbit. Geosynchronous orbits, Weightlessness, Escape velocity, Basic idea of GPS

UNIT 5: (12 hour : 14 Mark)

Elasticity: Elasticity, Stress and Strain, Hooke's law, Relation between Longitudinal Stress and Strain(stress-strain diagram), Modulus of Rigidity, Poission's Ratio, Determination of Young modulus by Searles method.

Oscillations: Simple Harmonic Motion, Equation for SHM and its Solutions, Terms associated with SHM like (Time Period, Frequency, Amplitude, and Phase), SHM as a Projection of Circular Motion, Energy conservation in simple harmonic motion, Kinetic and Potential Energy, Damped Oscillations, Forced Oscillation and Resonance.Numerical Examples.

Reference books for unit 3,4,5:

1. Concept of physics By H C Verma part 1 Publisher: BharatiBhawan

2. Sears and Zemansky's University Physics with modern physics By H D Young Publisher: PEARSON

Other Reference books:

1. Mechanics Berkeley Physics course Vol 1

2. Lectures on physics, R.P.Feynman, Vol-1

3. Physics – Resnick and Halliday

4. Principles of electronics By V.K.Mehta Publisher: S.Chand

5. Electronic Device And Circuits By Allen Mottershead Pub: PHI

LIST OF EXPERIMENTS

B.Sc. Semester-I

1. To Study of errors in observation Using Vernier Caliper, Micrometer Screw.

2. To determine 'g' and radius of gyration using Bar Pendulum,

3. To determine the Moment of Inertia of rectangular body & prove law of perpendicular axis by Bifilar Suspension.

4. To determine the Moment of Inertia & Modulus of rigidity by Torsional pendulum.

5. To determine the Young's Modulus of long wire by Searl's method.

6. To determine the Poisson's ratio of rubber tube.

7. To study of Charging and Discharging of Capacitor and RC time constant.

8. To determine Low resistance by Projection method.

9. To study of Tangent galvanometer (Constant of T.G. & Verification of Ohm's law, to find reduction factor of TG)

10. To determine Low resistance by Potentiometer.

11. To study Semiconductor Diode Characteristics.

12. To study Zener diode Characteristics

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)