TAMIL NADU OPEN UNIVERSITY

Chennai - 15

School of Science

ASSIGNMENT -I

Programme Code No	: 181
Programme Name	: B.Sc., Physics
Course Code & Name	: BPHY-11: Mechanics, Properties of Matter and Sound
Batch	: AY 2018-19
No.of Assignment	: One Assignment for Each 2 Credits
Maximum Marks	100
Weightage	: 25%

PART A (4 x 10 = 40)

Answer all the Questions

1. Exolain Newton's Second law of motion
2. Explain Newton's law of impact
3. Explain the term Centre of mass with example
4. Explain law of conservation of momentum

Part – B (2 x 30 = 60 Marks)

Answer **any two** of the questions.

1. To derive an expression for loss of Kinetic energy due to direct impact of two smooth spheres
2. What is mean by collision? Explain its types and derive an expression for the same
3. (i)Explain the term Projectile motion
   (ii) Defne the term Friction. Explain limiting and static friction

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ASSIGNMENT -II

Programme Code No	: 181
Programme Name	: B.Sc., Physics
Course Code & Name	: BPHY-11: Mechanics, Properties of Matter and Sound
Batch	: AY 2018-19
No.of Assignment	: One Assignment for Each 2 Credits
Maximum Marks	100
Weightage	: 25%

PART A (4 x 10 = 40)

Answer all the Questions

1. Exolain Kepler's laws of planetary motion
2. Explain Newton's law of gravitation
3. Explain the term Geostationary Satellite and polar satellite
4. Derive an expression for orbital velocity

Part – B (2 x 30 = 60 Marks)

Answer **any two** of the questions.

1. To derive an expression for gravitational potential and field at a point due to a spherical shell
2. Explain how to calculate the Universal constant value by using Boy‟ s Method.
3. To derive an expression for variation of "g" with latitude altitude and depth.

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ASSIGNMENT -III

Programme Code No	: 181
Programme Name	: B.Sc., Physics
Course Code & Name	: BPHY-11: Mechanics, Properties of Matter and Sound
Batch	: AY 2018-19
No.of Assignment	: One Assignment for Each 2 Credits
Maximum Marks	100
Weightage	: 25%

PART A (4 x 10 = 40)

Answer all the Questions

1. Define the term elasticity and Explain three types of Modulus of Elasticity
2. Derive an expression for couple per twist of a wire
3. Derive an expression for bending of moment
4. Deriven an expression for excess of pressure inside a soap bubble.

Part – B (2 x 30 = 60 Marks)

Answer **any two** of the questions.

1. Explain with necessary theory for young's uniform and non-uniform bending.
2. Explain the principle, construction and working of Torsion pendulum
3. (i) Explain the term cantilever
   (ii) Explain static torsion and its types

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ASSIGNMENT -IV

Programme Code No	: 181
Programme Name	: B.Sc., Physics
Course Code & Name	: BPHY-11: Mechanics, Properties of Matter and Sound
Batch	: AY 2018-19
No.of Assignment	: One Assignment for Each 2 Credits
Maximum Marks	100
Weightage	: 25%

PART A (4 x 10 = 40)

Answer all the Questions

1. Exolain Molecular theory of surface tension and derive the relationship between surface energy and surface tension
2. What are stationary waves? List out the properties of stationary waves
3. Explain the construction and working of piezoelectric oscillator
4. Derive an expression for co efficient of viscosity and explain the term streamline and turbulent flow

Part – B (2 x 30 = 60 Marks)

Answer **any two** of the questions.

1. What is Doppler effect? Explain it.
2. State and prove Bernoulli's theorem
3. To derive an expression for surface tension of liquid using capilarity.

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ASSIGNMENT -I

Programme Code No	: 181
Programme Name	: B.Sc., Physics
Course Code & Name	: BPHY-12: Optics and Spectroscopy
Batch	: AY 2018-19
No.of Assignment	: One Assignment for Each 2 Credits
Maximum Marks	100
Weightage	: 25%

PART A (4 x 10 = 40)

Answer all the Questions

1. Explain Dispersion and Refraction through a prism
2. Explain the term aberration of lenses
3. How to minimise sperical aberration in lenses?
4. Explain the construction and working of Huygen's eyepiece

Part – B (2 x 30 = 60 Marks)

Answer **any two** of the questions.

1. Derive an expression for combination of to produce deviation with out dispersion
2. Deduce the condition for minimum spherical aberration of two thin lenses- separated by a distance
3. Explain achromatic combination of lenses and derive the condition for achromatism of two thin lenses separated by a finite distance.

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ASSIGNMENT -II

Programme Code No	: 181
Programme Name	: B.Sc., Physics
Course Code & Name	: BPHY-12: Optics and Spectroscopy
Batch	: AY 2018-19
No.of Assignment	: One Assignment for Each 2 Credits
Maximum Marks	100
Weightage	: 25%

PART A (4 x 10 = 40)

Answer all the Questions

1. Explain Young's Double slit experiment
2. Explain Fresnel's Biprism
3. What is Airwedge method?. To derive an expression for thickness of thin wire using airwedge.
4. What is half period zone? Explain

Part – B (2 x 30 = 60 Marks)

Answer **any two** of the questions.

1. To derive an expression for thickness of thin flim due to interference of light.
2. Explain the construction and working of Michelson's Interferometer
3. Explain Fresnel and Fraunhofer diffraction in detail

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ASSIGNMENT -III

Programme Code No	: 181
Programme Name	: B.Sc., Physics
Course Code & Name	: BPHY-12: Optics and Spectroscopy
Batch	: AY 2018-19
No.of Assignment	: One Assignment for Each 2 Credits
Maximum Marks	100
Weightage	: 25%

PART A (4 x 10 = 40)

Answer all the Questions

1. What is meany by zonal plate? Explain
2. Explain resolving power of optical instruments
3. Explain the constrution and working of Nicol prism.
4. What is meant by Half wave plate?

Part – B (2 x 30 = 60 Marks)

Answer **any two** of the questions.

1. What is meant by Plane Transmission grating? Give the necessory theory and derive an expression for wavelength of unknown sourcs.
2. Explain the following terms
   (i) Brewster's law
   (ii) Double refraction
   (iii)Pile of plates
3. Explain the construction and working of astronomical telescope

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ASSIGNMENT -IV

Programme Code No	: 181
Programme Name	: B.Sc., Physics
Course Code & Name	: BPHY-12: Optics and Spectroscopy
Batch	: AY 2018-19
No.of Assignment	: One Assignment for Each 2 Credits
Maximum Marks	100
Weightage	: 25%

PART A (4 x 10 = 40)

Answer all the Questions

1. Explain the constrution and working of Nicol prism.
2. What is meant by Half wave plate?
3. Explain the constrution and working of Laurentz half shade polarimeter
4. Explain the term IR rays and its applications

Part – B (2 x 30 = 60 Marks)

Answer **any two** of the questions.

1. What is Raman effect? Derive an expression for Raman shift with necessary theory
2. Derive an expression for Einstien’s Coefficent for laser action
3. Explain UV rays and its types and applications

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ASSIGNMENT

Programme Code No	: 181
Programme Name	: B.Sc., Mathematics
Course Code & Name	: BPHYA-01, Differential Equations
Batch	: AY 2018-19
No.of Assignment	: One Assignment for Each 2 Credits
Maximum Marks	: 100
Weightage	: 25%

Assignment – I

Part – A (4 x 10 = 40 Marks)

Answer all questions. Each question carries 10 marks.

1. Solve : $2xy + (y^2 - x^2)\frac{dy}{dx} = 0$
2. Solve : $x(x^2 + y^2 - a^2)dx + y(x^2 - y^2 - b^2)dy = 0$.
3. Solve : $\frac{dx}{yz} = \frac{dy}{zx} = \frac{dz}{xy}$
4. Solve : $\sqrt{p} + \sqrt{q} = \sqrt{y}$

Part – B (2 x 30 = 60 Marks)

Answer any two of the questions. Each question carries 30 marks.

1. (a) Solve : $(D^2 - 8D + 9)Y = 8\cos 5x$.

   (b) Solve : $(D^2 - 5D + 6)\ Y = x^2 - x + 2$

2. Solve: $x^2\frac{d^2y}{dx^2} + 3x\frac{dy}{dx} + y = \frac{1}{(1-x)^2}$
3. Solve by the method of variation of parameters.

   $\frac{d^2y}{dx^2} + 4y = \text{cosec } 2x$

Assignment – II

Part – A (4 x 10 = 40 Marks)

Answer all questions. Each question carries 10 marks.

1. Solve : $x^2 ydx - (x^3 + y^3)$ dy = 0
2. Solve : $(x^2 + y^2 + 2x)$ dx + 2*ydy* = 0.
3. Solve : $\frac{dx}{x(y-z)} = \frac{dy}{y(z-x)} = \frac{dz}{z(x-y)}$
4. Solve : Find L [t e^{-t}sint].

Part – B (2 x 30 = 60 Marks)

Answer any two of the questions. Each question carries 30 marks.

1 (a). Solve : $(D^2 - 4D + 3)Y = \sin 3x \cos 2x$.

(b). Solve : $(D^2 - 2D + 4)$ Y = e^x cosx.

2. Solve: $x^2 \frac{d^2y}{dx^2} - x \frac{dy}{dx} + y = \frac{\log x.sin(log\ x)+1}{X}$
3. Solve by the method of variation of parameters.

$$x^2 \frac{d^2y}{dx^2} + x \frac{dy}{dx} - y = x^2 e^x$$