Pre-University Remedial Program for 2014 E.C. ESSLCE Examinees

Physics Module

Credits-4hrs/week

Duration: Six months (96 hours)

Prepared by:-

Dr Deresse Terfa

Dr Tamne Hailu

Dr Tsegaye Kassa

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Contents

Chapter one: Vectors (5hrs) 4

1.1 Vector and Scalar quantities 4

1.2 Vector addition and subtraction 4

1.3 Multiplication of vectors 4

Chapter Two: Kinematics (12hrs) 4

2.1 Motion in one dimension 4

2.2 Motion in two dimensions 4

Chapter Three: Angular motion (5hrs) 4

3.1 Angular Position 4

3.2 Angular velocity 4

3.3 Angular Acceleration 4

3.4 Relation between linear and angular motion 4

Chapter Four: Dynamics (13hrs) 4

4.1 Types of forces (contact force, Normal force friction force, applied force, gravitational force, restoring force…) 4

4.2 Newtonian's laws of motion 4

4.3 Applications of Newton's Laws. 4

4.4 Linear momentum (elastic and non-elastic collision) 4

4.5 Center of mass and moment of inertia 4

4.6 Torque and angular momentum 4

4.7 Conditions of Equilibrium (First and second) 4

Chapter Five: Work, energy and power (9hrs) 4

5.1 Work done by constant and variable forces 4

5.2 Conservation of energy 4

5.3 Work energy theorem 4

5.4 Conservative forces 4

5.5 Power 5

Chapter Six: Oscillation and Waves (12hrs) 5

6.1 Oscillatory motion 5

6.2 Properties of wave (frequency, wave length, period) 5

6.3 Types of Waves 5

6.4 Wave behavior (reflection, refraction, interference, diffraction) 5

6.5 Wave equation 5
Chapter Seven: Heat and thermodynamics (10hrs) 5
7.1 Temperature and Heat 5
7.2 The effect of heat on materials (change of Temperature, expansion, change of phase, heat capacity) 5
7.3Laws of thermodynamics (zeros, first and second Laws) 5
Chapter Eight: Electrostatics and Magnetism (12hrs) 5
8.1 Coulomb Law 5
8.2 Electric field due to point charges 5
8.3 Electric field lines 5
8.4Electric Potential due to point charges 5
8.5 Capacitors (capacitance and Capacitor networks) 5
Chapter Nine: Electric current and Magnetism (13hrs) 6
9.1 Electric current (ohm's law, resistance & Resistivity, measuring instruments) 6
9.2 Electric Circuit (series, parallel) 6
9.3 Sources of magnetic field (Bar magnet, Earth magnetic field, moving charge, electric current) 6
9.4 Magnetic forces (on charged particles and current carrying conductor, two current carrying wires) 6
Chapter Ten: Electromagnetic Induction and AC current (5hrs) 6
10.1 Magnetic flux and Gauss law 6
10.2 Faradays Law 6
10.3 AC current 6
10.4 Transformer 6

Chapter one: Vectors (5hrs)

1.1 Vector and Scalar quantities

1.2 Vector addition and subtraction

1.3 Multiplication of vectors

Chapter Two: Kinematics (12hrs)

2.1 Motion in one dimension

2.1.1 Position and reference frame

2.1.2 Distance and displacement

2.1.3 Speed and velocity

2.1.4 Uniform motion

2.1.5 Uniformly accelerated motion

2.2 Motion in two dimensions

2.2.1 Projectile motion

2.2.2 Circular motion

Chapter Three: Angular motion (5hrs)

3.1 Angular Position

3.2 Angular velocity

3.3 Angular Acceleration

3.4 Relation between linear and angular motion

Chapter Four: Dynamics (13hrs)

4.1 Types of forces (contact force, Normal force friction force, applied force, gravitational force, restoring force…)

4.2 Newtonian's laws of motion

4.3 Applications of Newton's Laws.

4.4 Linear momentum (elastic and non-elastic collision)

4.5 Center of mass and moment of inertia

4.6 Torque and angular momentum

4.7 Conditions of Equilibrium (First and second)

Chapter Five: Work, energy and power (9hrs)

5.1 Work done by constant and variable forces

5.2 Conservation of energy

5.3 Work energy theorem

5.4 Conservative forces

5.5 Power

Chapter Six: Oscillation and Waves (12hrs)

6.1 Oscillatory motion

6.1.1 Harmonic Motion

6.1.2 Damped and Forced Oscillation

6.2 Properties of wave (frequency, wave length, period)

6.3 Types of Waves

6.3.1 Transverse and longitudinal

6.3.2 Mechanical and Electromagnetic wave

6.4 Wave behavior (reflection, refraction, interference, diffraction)

6.5 Wave equation

Chapter Seven: Heat and thermodynamics (10hrs)

7.1 Temperature and Heat

7.2 The effect of heat on materials (change of Temperature, expansion, change of phase, heat capacity)

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Chapter Ten: Electromagnetic Induction and AC current (5hrs)

10.1 Magnetic flux and Gauss law

10.2 Faradays Law

10.3 AC current

10.4 Transformer

References

1. High school textbooks
2. Raymond A. Serway, John W. Jewett - *Physics for scientists and engineers* (2004, Thomson-Brooks_Cole)
3. Robert Resnick and David Halliday, *Fundamentals of Physics Extended*, HRW 8th ed., 2008
4. Douglas C. Giancoli, *Physics for scientists and engineers*, Printice Hall, 4th, 2005

Mode of delivery

Activity based interactive teaching approach will be applied.