2022 Sec 4 Physics End-of-Year Examination

Topics & Guidelines for Revision

Name: …… **( ) Class: 4/** …… **Date:** ……

	2021 Sec 3	Practicals/ Hands-On activities/ *Textbook*	Assignments	T3 week			Break	T4 week		
	Topical Notes			8	9	10		1	2	3
1	**Physical Quantities & Measurements** (including graphical skills)	P01: Measurement	A1: Physical quantities & measurements							
2	**Reflection** • Laws of reflection • Image in plane mirror • Reflection ray diagrams for a light ray, cone of light	P02: Reflection *Read Chapter 13 in textbook (p.250-281)*	A2: Reflection							
3	**Refraction** • Laws of refraction • Refractive index • Refraction ray diagrams • Total internal reflection	P03: Refraction *Read Chapter 13.2*	A3.1: Refraction							
			A3.2: Total internal reflection							
4	**Lenses** • Thin lens, magnification of images, ray diagrams • Lens formula	P04: Convex lens *Read Chapter 13.3*	A4.1: Lenses							
			A4.2: Lens formulae							
5	**Kinematics** • Speed, velocity, acceleration • Graphical analysis • Free-fall • Equations of motion	P05: Pendulum P06: Rolling Marble *Read Chapter 2 (textbook)*	A5.1: Speed, velocity & acceleration							
			A5.2: s-t & v-t graphs							
			A5.3: Equations of motion							
6	**Dynamics** • Types of forces, free-body diagram, balanced & unbalanced forces • Newton's 1st, 2nd & 3rd laws of motion • Vector addition • Vector resolution	P07: Forces in equilibrium *Read Chapters 3 & 4*	A6.1: Types of forces & free-body diagrams							
			A6.2: Newton's 1st law							
			A6.3: Newton's 2nd & 3rd laws							
			A6.4: Vector addition of forces							
7	**Turning effect of forces** • Moment of a force • Principle of moments • Centre of gravity & stability	P08: Balancing masses P09: CG of triangular card HO1: Turning Effects of Forces *Read Chapter 5 in textbook*	A7.1: Moments							
			A7.2: CG & Stability							
8	**Work, energy, power** • Energy & energy conversion • Principle of conservation of energy • Work done • Power, Efficiency	*Read Chapter 7 in textbook*	A8: Work, energy, power & efficiency							

Note:

- ***Track your progress using "✓" (planned) and "X" (revised) against each item.***
- *Also read up on **Glossary of Terms** & **Mathematical Skills** in Building a Strong Foundation in Physics notes (given in Jan 2021).*

	2022 Sec 4	Practicals/ Hands-On activities/ *Textbook*	Assignments	T3 week			Break	T4 week		
	Topical Notes			**8**	**9**	**10**		**1**	**2**	**3**
9	**Pressure** • Pressure • Pressure differences • Pressure measurement	HO1: Pressure all around us HO2: Hydrostatic pressure *Read Chapter 6 in textbook*	A9: Pressure							
10	**Electromagnetic spectrum** • Properties, applications, effects on cells & tissue	*Read Chapter 14*								
11	**General wave properties** • Wave motion, wave terms • Longitudinal & transverse waves • Reflection & refraction of plane waves	*Read Chapter 12*	A11: General wave properties							
12	**Sound** • Sound waves, speed of sound & echo • Ultrasound • Use of C.R.O.	E01: Sound *Read Chapter 15*	A12: Sound							
13	**Static electricity** • Electrostatics • Electric fields • Applications	E02: Static electricity *Read Chapter 16*	A13: Static electricity							
14	**Current of electricity** • Charge & electric current • E.m.f. & p.d. • Resistance	*Read Chapter 17*	A14: Current of electricity							
15	**D.C. circuits** • Series & parallel circuits • Potential divider circuit • Diode, thermistor, LDR	P03: p.d. & current in a resistor, lamp P04: resistance wire *Read Chapter 18*	A15.1: D.C. circuits							
			A15.2: Thermistor & LDR							
16	**Practical electricity** • Sources of electrical energy • Electric power & energy • Dangers & safe use of electricity in the home	*Read Chapter 19*	A16: Practical electricity							
17	**Magnetism** • Laws of magnetism • Magnetic properties of matter • Magnetic field	E04: Magnetism & Electromagnetism	A17: Magnetism							
18	**Electromagnetism** • Magnetic effect of a current • Applications • Force on current-carrying conductor • The d.c. motor	E05: d.c. motors	A18: Electromagnetism							
19	**Electromagnetic Induction (EMI)** • Principles of EMI • a.c. generator • Transformer and power transmission	E06: Electromagnetic Induction	A19A: Electromagnetic Induction							
			A19B: Transformers							
20	**Thermal physics** • Temperature • Kinetic model of matter • Transfer of thermal energy • Thermal properties of matter	P05: Rate of cooling of water P06: Temperature of a Bunsen flame	A20: Thermal physics							

	WA	MYE	Practical Exam (15%)	EOY Exam (50%)
Weighting	15 %	20 %	65 %	

Schedule & Format for Physics Papers

Date	Time (duration)	Paper (marks)	Structure & marks	Remarks
Term 4 week 5 **11 Oct Thursday** (in class rooms)	**0845** **-0930h** (45 min)	**Paper 1 (30 marks)**	• 30 MCQ • **Shade** all answers on Optical Answer Sheet (OAS) using 2B pencil.	Shade the answers along the way. **Do NOT wait till end of paper to start shading!**
	1100 **-1245h** (1 hour 45 min)	**Paper 2 (70 marks)**	**Section A** (40 marks) • short structured questions	Answer all questions in the spaces provided. *Spend about **1 hour.***
			Section B (30 marks) • 3 long questions • 2 compulsory questions • For 3rd question, **choose to answer Either / Or**	Answer all questions in the spaces provided. *Spend about **45 min.***

Advice for Exam Preparation

- Plan (by date/week) and start your revision **before** end of Term 3 so that you have sufficient time to
  - cover all topics thoroughly (notes & assignments),
  - have a quick review of past assessments (quizzes, exams, etc.) and
  - **do summary notes for key/difficult topics**
  - practise questions from previous years' EOY papers and physics workbook/past-year series.
- Be prepared to handle questions for all **Specific Instructional Objectives** (on first page of topical notes). Also refer to **textbook** "All about Physics" for detailed explanations, worked examples and additional practice **questions** (at the end of each topic).

General Advice for Exam Day

- Get ready your scientific **calculator** (in good working order), a mathematical set (including **protractor**, & **set square**) and a **30 cm semi-transparent ruler**.
- Have sufficient sleep/rest the day before the paper.
- Ensure you have a spare pen, **2B** pencil and eraser.
- **You are NOT allowed** to use any correction fluid/tape in the exam venue.
- **Manage your time carefully during the papers!** (Every 1 mark is about 1.5 minutes of work.)

Problem Solving Approach in Physics: I SEE*

**Adapted from University Physics (with Modern Physics) by Young and Freedman, 2008 (12th Edn).*

IDENTIFY the relevant concepts Try to **understand** the physics of the problem first	1. identify the required variable(s) 2. recall related physical laws/principles, formulae and equations 3. recall similar systems in related topics
SET UP the problem	1. Sketch a **diagram** (this is usually helpful). 2. Choose & **state** the **equations** or **formulae** you'll use to solve the problem. 3. Try to keep expressions algebraic (using **suitable symbols**) rather than numerical.
EXECUTE the solution	1. List known and unknown **quantities**. 2. Solve the equations for the unknowns. 3. Show your **working** neatly and clearly on the page, and explain what you are doing and why you are doing it.
EVALUATE the answer	1. Check the **units** of your answer. 2. Generally, **use 2 or 3 significant figures** in your **final** numerical ans (keep more s.f.s for intermediate steps). 3. Check the **magnitude** of your answer against common sense or other knowledge.