

2012 SPM Exams Tips and Predictions – Physics

Paper 2

Section A:

Question 1: Form 4 (Chapter 1)

- Measuring Instrument - **Vernier calliper/micrometer screw gauge / stop watch** (reading, accuracy, zero error, decimal places)

Question 2: Form 5 (Chapter 2)

- **Heating element of immersion heater** (design of immersion heater: coiled, thin)(Calculation of power produced)

Question 3: Form 4 (Chapter 2)

- **Impulsive force**

Question 4: Form 4 (Chapter 3)

- **Bernoulli Principle** (function of aerofoil to produce lifting force/downward force)

Question 5: Form 5 (Chapter 5)

- Properties of alpha particle, beta particle and gamma ray
- Equation for alpha, beta and gamma decay
- Calculation for the nuclear energy
- **Half life** calculation from the graph
- **Background radiation**

Question 6: Form 5 (Chapter 4)

- **Transistor as automatic switch** [explanation the operation, calculation (potential divider) and function of all components(relay, LDR, thermistor)]
- **Diode (4 diodes: full wave rectification and capacitor: to smoothen the voltage)**
- Logic gate system (NOT, AND, NAND, OR, NOR gate) (draw the symbol and truth table)

Question 7: Form 5 (Chapter 1)

- **Plane mirror**
- **Concave mirror** (as solar cooker, make-up mirror) (draw rays diagram)
- **Convex mirror** (as security mirror in the shop / sharp bend of road)

Question 8: Form 4 (Chapter 3)

- **Hot air balloon / hydrometer / submarine**

Section B: (Modify and explain)

Question 9-Essay: Form 4 (Chapter 4)

- Explain **sea breeze / land breeze**
- Explain and compare the S.H.C for two objects
- Design a **food container/cooking pot/cooling fins/pressure cooker/heater.**

Question 10-Essay: Form 5 (Chapter 3)

- Electromagnetic induction (Lenz Law and Faraday law)
- Explain the production of induce current and direction of induce current.
- Explain the operation of **transformer**
- Explain the operation of **D.C motor**
- Design a **transformer to run a DC motor.**
- Covert **A.C power to D.C power and produce higher voltage**

Section C: (Choose suitability)

Question 11-Essay: Form 4 (Chapter 5)

- **Refractive index and Refraction of light**
- Explain the formation of **road mirage**
- Prism periscope and optical fibre
- Choose power of lens, position of object, normal adjustment of **microscope @ telescope** and explain the reason. (draw the light ray diagrams)

Question 12-Essay: Form 5 (Chapter 1)

- **Ultrasound/SONAR** to detect depth of sea bed
- Choose the **characteristic of ultrasound** and **design of boat**

Paper 3

Section A: (Q1 and Q2)

[The MV,RV,CV, precaution, pattern and relationship of graph, decimal places, table with label of units, calculation of gradient with units]

Form 4 – Chapter 2

- (1) Force or mass with acceleration (Graph a against m)
- (2) Spring: Extension of spring with mass of load (Graph of x against m)

Form 4 – Chapter 5

- (3) Snell law experiment (Graph of $\sin i$ against $\sin r$)
- (4) Lens law experiment (Graph of $1/v$ against $1/u$)
- (5) Object distance and linear magnification of a convex lens (Graph of m against $1/u$)

Form 5 – Chapter 1

- (6) Interference of light/sound (Graph of x against a)

Form 5 – Chapter 2

- (7) Internal resistance of a dry cell (Graph of V against I)

Form 5 – Chapter 4

- (8) Transistor (Graph Base current, I_B against collector current I_C)

Section B: (Practical)

1. Form 4 (Chapter 3)

- (1) To investigate the relationship between the depth of liquid and pressure in liquid
- (2) To investigate the relationship between the depth of immersion and buoyant force

2. Form 4 (Chapter 4)

- (3) To investigate the relationship between the mass of water and increase in temperature.
- (4) To investigate the relationship between the pressure and volume of air (Boyle's Law)
- (5) To investigate the relationship between the temperature and volume of air (Charles' Law)
- (6) To investigate the relationship between the temperature and pressure of air (Pressure's Law)

3. Form 5 (Chapter 2)

- (7) To investigate the relationship between the current and potential difference (Ohm's Law)
- (8) To investigate the relationship between the length of the wire and the resistance of the wire
- (9) To investigate the relationship between the cross-sectional area of the wire and the resistance of the wire
- (10) To investigate the relationship between the temperature of the wire and the resistance of the wire

4. Form 5 (Chapter 3)

- (11) To investigate the relationship between the number of turns of coil and the induced current
- (12) To investigate the relationship between the speed of magnet and the induced current.