

## Useful Constants and Equations

The following useful equation may be unfamiliar to some students:

$$\rho = \frac{m}{V} \quad \text{density} = \text{mass} \div \text{volume}$$

$$c = f \times \lambda \quad \text{wave speed} = \text{frequency} \times \text{wavelength}$$

$$n = \frac{c}{v} \quad \text{refractive index} = \text{speed of light in vacuum} / \text{speed of light in medium}$$

## The following constants should be used:

$$g = 10 \text{ N/kg} \quad \text{gravitational field strength on Earth}$$

$$c = 3.0 \times 10^8 \text{ m/s} \quad \text{speed of light in a vacuum}$$

## 2022 IPC Answer Booklet (online)

Name: \_\_\_\_\_ School: \_\_\_\_\_ Account Number: \_\_\_\_\_

### Section A: Multiple choice questions. (10 marks)

Please record your answers from 1 to 10 in the **online system**.

### Section B: Short answer questions ( 10 marks )

#### Question 11

**Question 12**

An empty rectangular box with a thin black border, intended for the answer to part (a).

**(a)**

An empty rectangular box with a thin black border, intended for the answer to part (b).

**(b)**

An empty rectangular box with a thin black border, intended for the answer to part (c).

**(c)**

An empty rectangular box with a thin black border, intended for the answer to part (d).

**Section C: Longer answer questions (30 marks)**

**Question 13**

(a)

(b)

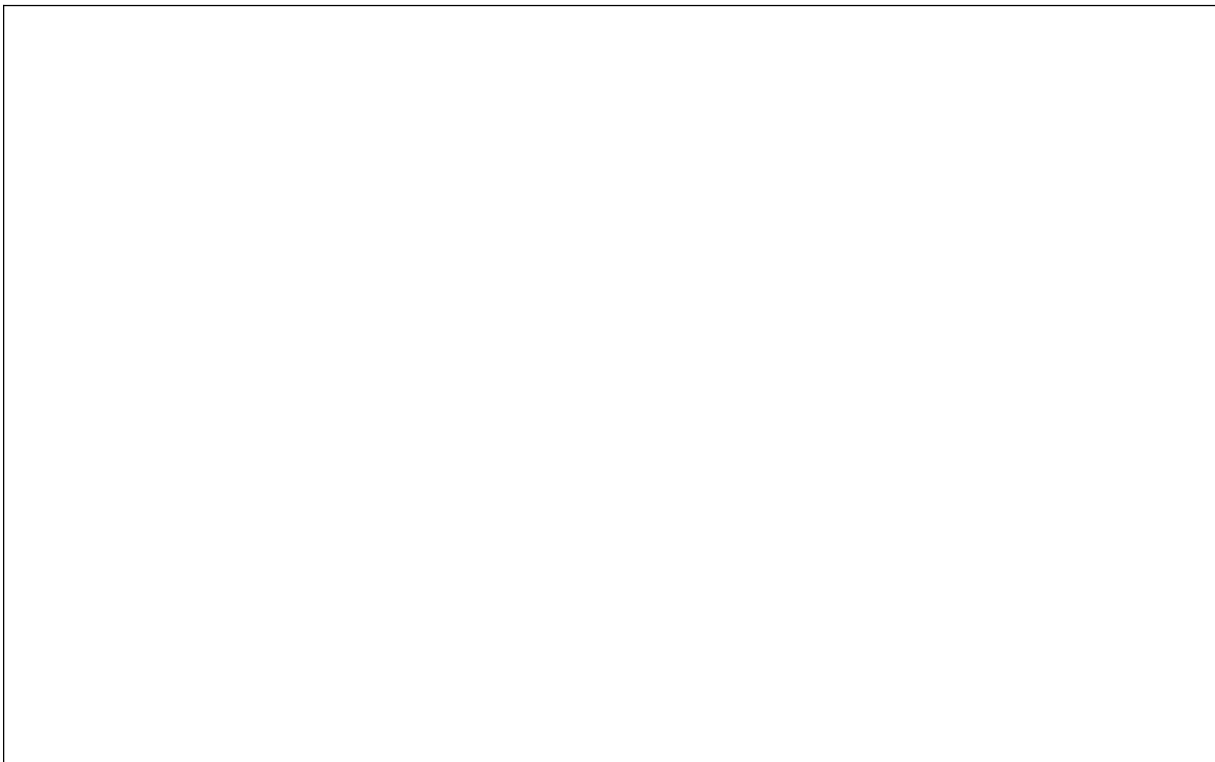
(c)

(d)

(e)



(f)



## Question 14

(a)

(b)

(c)

(d)

(e)

(f)

A large, empty rectangular box with a thin black border, intended for the answer to question (f).

(g)

A large, empty rectangular box with a thin black border, intended for the answer to question (g).

(h)

A large, empty rectangular box with a thin black border, intended for the answer to question (h).

(i)

A large, empty rectangular box with a thin black border, intended for the answer to question (i).

(j)

A large, empty rectangular box with a thin black border, intended for the answer to question (j).

(k)

