

Important Constants

Constant	Symbol	Value
Speed of light in free space	c	$3.00 \times 10^8 \text{ m s}^{-1}$
Elementary charge	e	$1.60 \times 10^{-19} \text{ C}$
Planck constant	h	$6.63 \times 10^{-34} \text{ J s}$
Mass of electron	m_e	$9.11 \times 10^{-31} \text{ kg}$
Mass of proton	m_p	$1.67 \times 10^{-27} \text{ kg}$
Acceleration of free fall at Earth's surface	g	9.81 m s^{-2}
Avogadro constant	N_A	$6.02 \times 10^{23} \text{ mol}^{-1}$
Radius of Earth	R_E	$6.37 \times 10^6 \text{ m}$
Radius of Earth's orbit	R_0	$1.496 \times 10^{11} \text{ m}$

$$T_{(\text{K})} = T_{(^{\circ}\text{C})} + 273$$

$$\text{Volume of a sphere} = \frac{4}{3}\pi r^3$$

$$\text{Surface area of a sphere} = 4\pi r^2$$

$$v^2 = u^2 + 2as$$

$$v = u + at$$

$$s = ut + \frac{1}{2}at^2$$

$$s = \frac{1}{2}(u + v)t$$

$$E = hf$$

$$R = \frac{\rho \ell}{A}$$

$$P = Fv$$

$$P = E/t$$

$$P = VI$$

$$V = IR$$

$$v = f\lambda$$

$$R = R_1 + R_2$$

$$\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2}$$

$$PV = \text{const.}$$

$$\frac{PV}{T} = \text{const.}$$

2022 SPC Answer Booklet (online)

Name: _____ School: _____ Account Number: _____

Question 1-5 Select the best answer

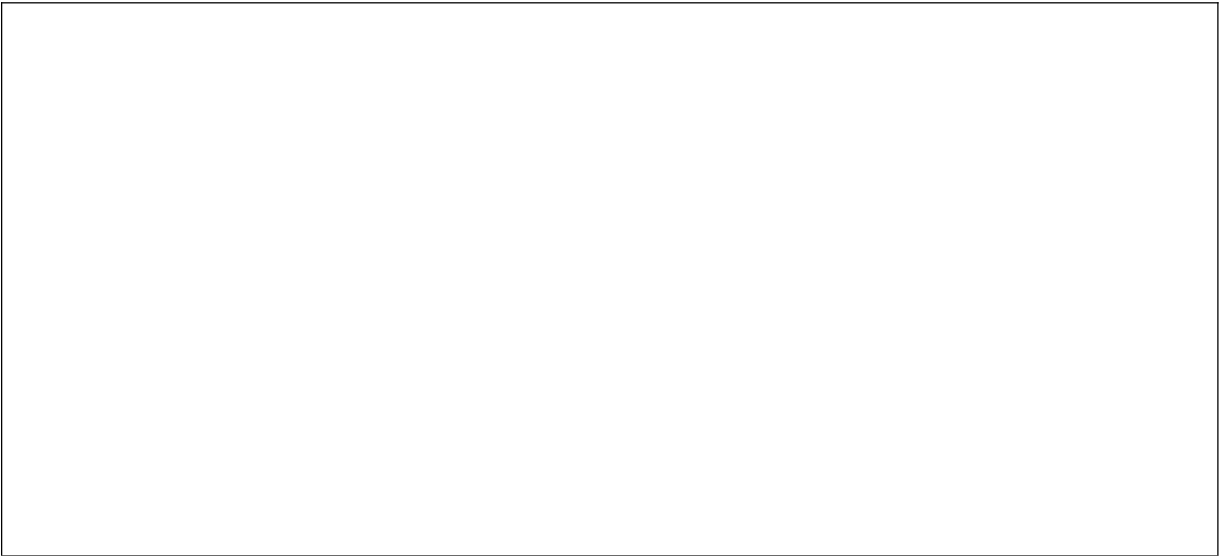
Please record your answers from 1 to 5 in the **online system**.

Question 6

(a) i

ii

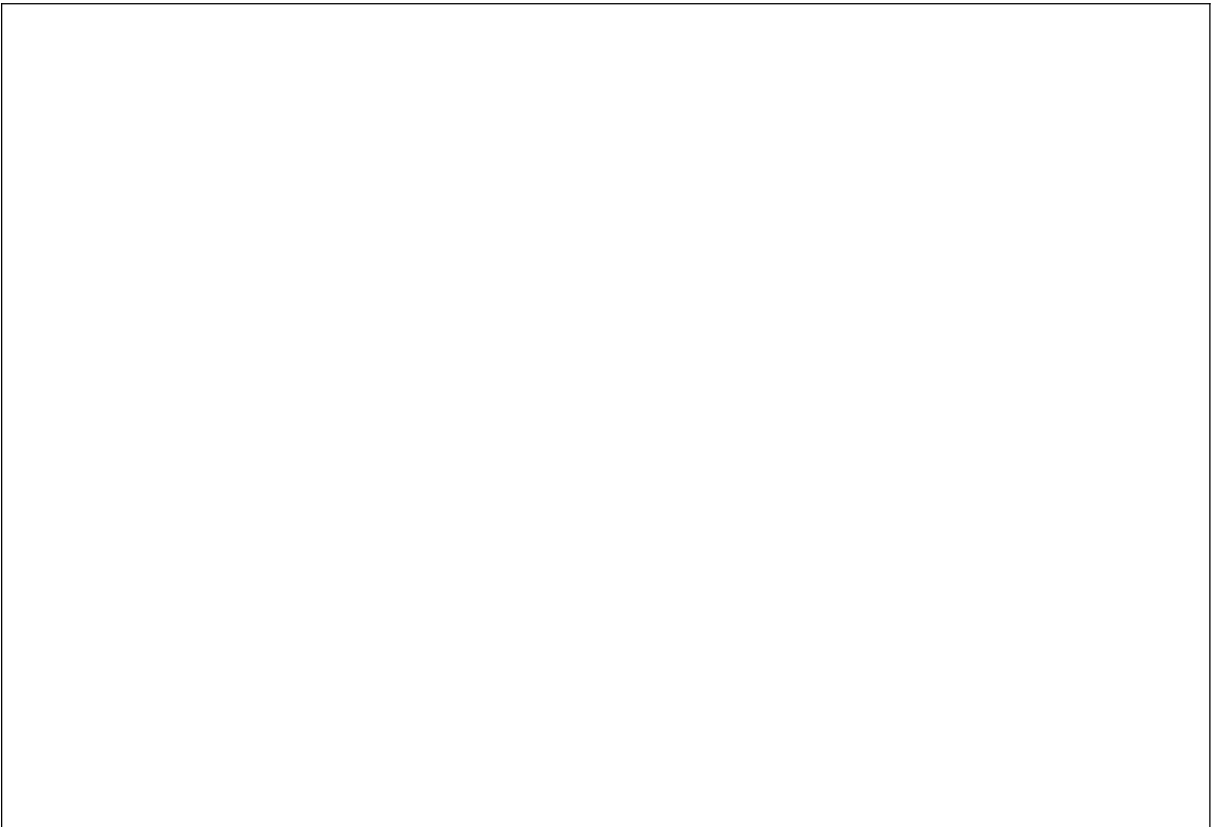
(b) i



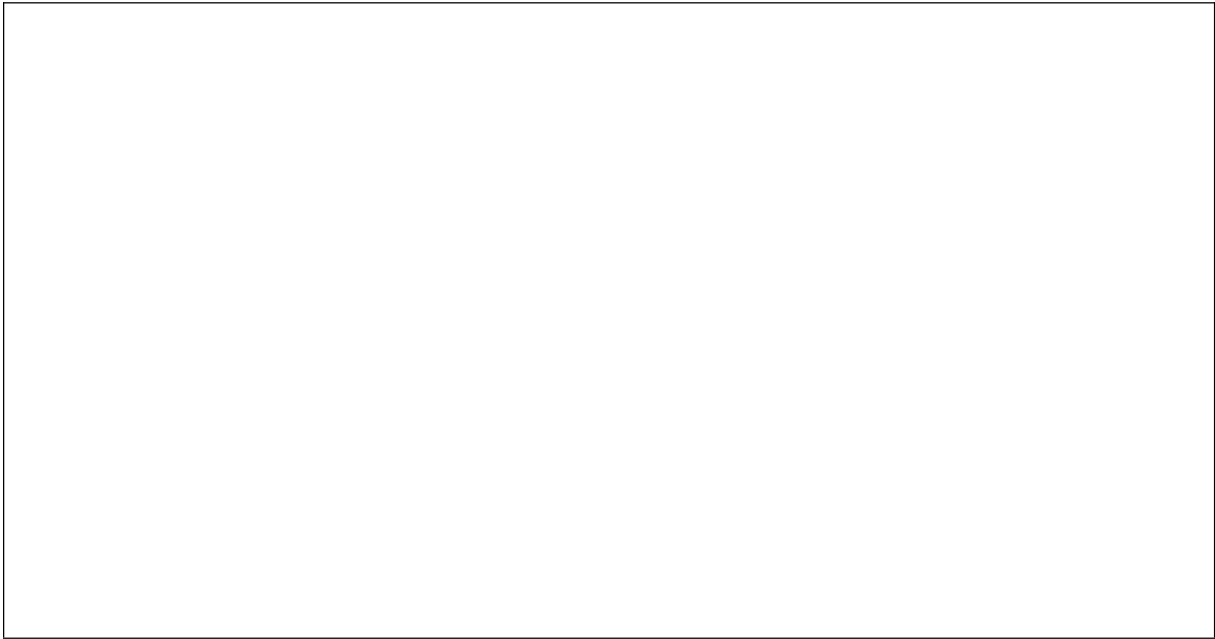
Question 7



Question 8

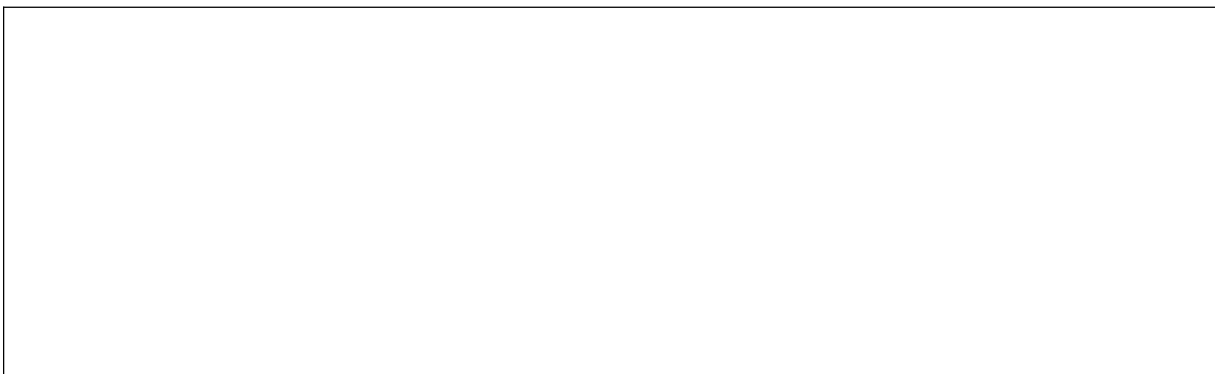


Question 9



Question 10

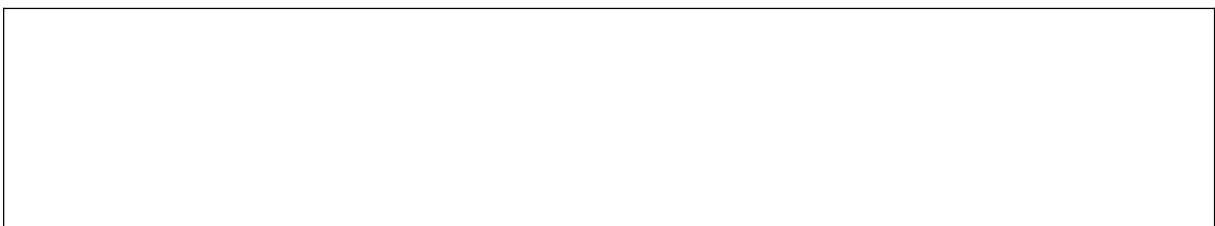
(a)



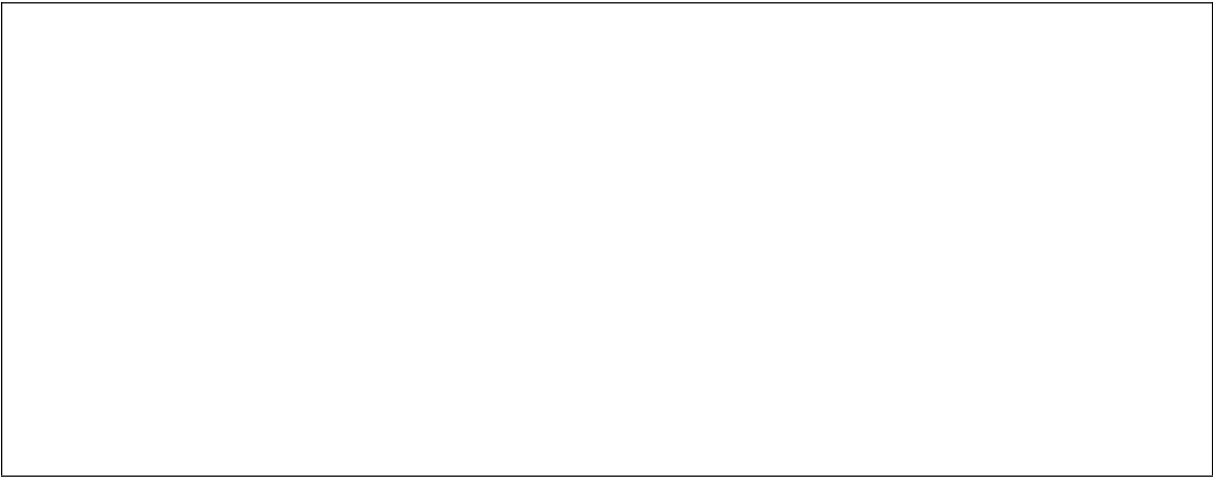
(b)



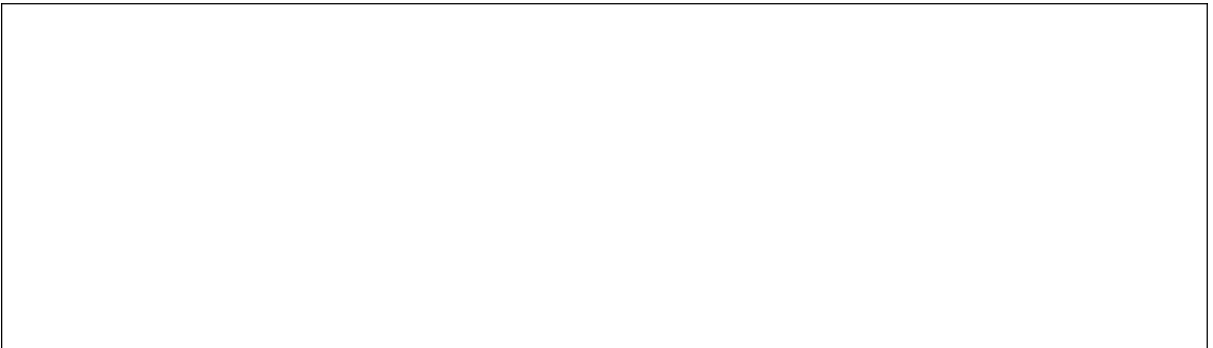
(c) i



ii



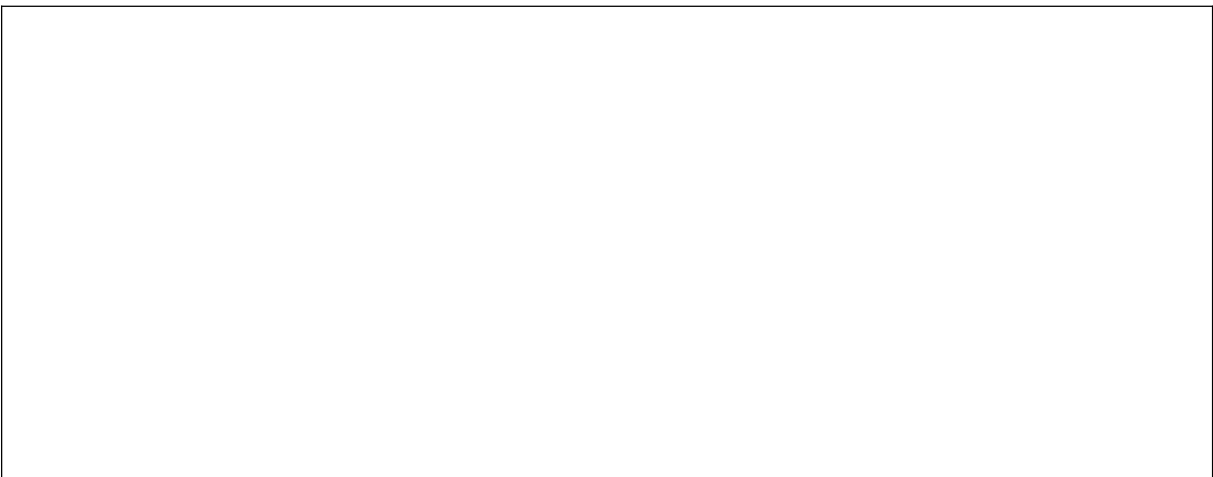
iii



(d) i



ii



Question 11

(a) i

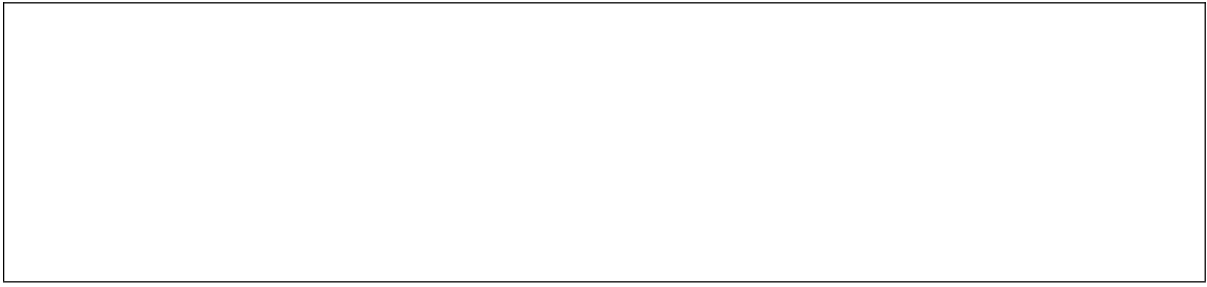
ii

(b) i

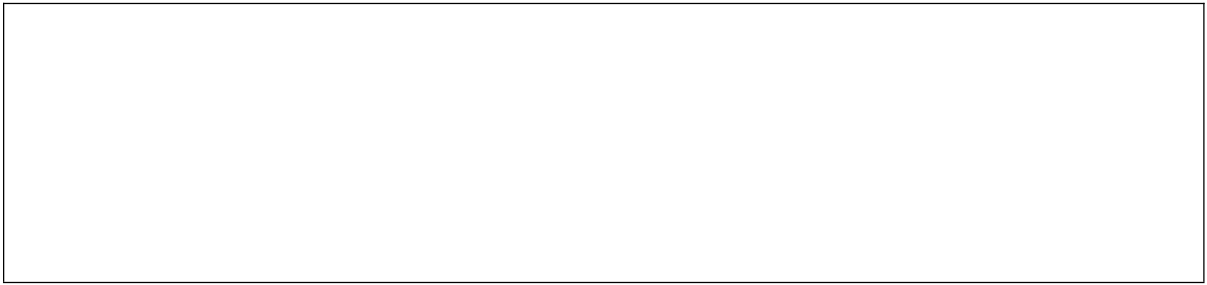
ii

iii

(c) i



ii



(d) i



ii

