2025 SPC Answer Booklet (online)

Name： _____ **School：** _____ **Account Number:** _____

Section A - 1-6 Select the best answer. (12 marks)

Please record your answers from **1** to **6** on the exam platform.

Section B - Longer Answer Questions. (38 marks)

7. (3 marks)

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8. (4 marks)

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9. (5 marks)

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10. (4 marks)

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11. (6 marks)

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12. (8 marks)

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13. (8 marks)

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Important Constants

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

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

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

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

$$v^2 = u^2 + 2as \qquad v = u + at$$

$$s = ut + \tfrac{1}{2}at^2 \qquad s = \tfrac{1}{2}(u+v)t$$

$$E = hf \qquad R = \frac{\rho\ell}{A}$$

$$P = Fv \qquad P = E/t$$

$$P = VI \qquad V = IR$$

$$v = f\lambda \qquad P = \rho g h$$

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

$$PV = \textit{const.} \qquad \frac{PV}{T} = \textit{const.}$$