

Name of the Student: _____

Max. Marks : 20 Marks

Time : 20 Minutes

Mark Schemes

Q1.

Question Number	Acceptable answers	Additional guidance	Mark
	The only correct answer is D because magnification is numerically equal to image distance divided by object distance A is not correct because magnification is numerically equal to image distance divided by object distance, but this is focal length divided by object distance B is not correct because magnification is numerically equal to image distance divided by object distance, but this is object distance divided by image distance C is not correct because magnification is numerically equal to image distance divided by object distance, but this is object distance divided by focal length		1

Q2.

Question Number	Answer	Mark
	D Comparing to $y=mx+c$ format with v as y and $\sqrt{T}$ as x	1
	Incorrect Answers: A – this assumes T is proportional to $\sqrt{v}$ B – this assumes v is proportional to T C – this assumes $\frac{1}{T}$ is proportional to v	

Q3.

Question Number	Acceptable Answers	Additional Guidance	Mark
	D		1

Q4.

Question Number	Answer	Mark
	$A \ I = \frac{P}{\pi r^2}$	1
	Incorrect Answers: B incorrect arrangement C incorrect formula for area of a circle D incorrect arrangement and incorrect formula for area of a circle	

Q5.

Question Number	Answer	Mark
	The only correct answer is C because 10 cm is more than the focal length from a converging lens A diverging lenses do not form real images from real objects B diverging lenses do not form real images from real objects D an object at less than the focal length from a converging lens will form a virtual image	1

Q6.

Question Number	Acceptable Answers	Additional Guidance	Mark
	A		1

Q7.

Question Number	Answer	Mark
	D	1

Q8.

Question Number	Acceptable answer	Additional guidance	Mark
	C	The only correct answer is C because the corrected count rate at 30 cm is 40 counts per minute, the corrected rate at twice the distance is a quarter of this value, which is 10 counts per minute, and adding the background gives the value of 34 A is not the correct answer because it is 16 C is not the correct answer because it is 32 D is not the correct answer because it is 44	1

Q9.

Question Number	Answer	Mark
	C	1

Q10.

Question Number	Answer	Mark
	A	1

Q11.

Question Number	Acceptable answers	Additional guidance	Mark
	C		1

Q12.

Question Number	Answer	Mark
	D – $\frac{P}{\pi r^2}$ Incorrect Answers: A – Incorrect equations B – Incorrect equation for area of a circle C – Incorrect equation	1

Q13.

Question Number	Answer	Mark
	B – TIR as angle of incidence is greater than the critical angle	1
	Incorrect Answers: A – light is reflecting at an incorrect angle C – light is not refracted D – light is not refracted	

Q14.

Question Number	Answer	Mark
	D – both are moving up	1
	Incorrect Answers: A – incorrect answer B – incorrect answer C – incorrect answer	

Q15.

Question Number	Answer	Mark
	A	1

Q16.

Question Number	Answer	Mark
	B	1

Q17.

Question Number	Answer	Mark
	C - 1.5	1
	Incorrect Answers: all select incorrect data from question Correct method: image distance ÷ object distance A – uses focal length ÷ object distance B – uses object distance ÷ image distance D – uses object distance ÷ focal length	

Q18.

Question Number	Acceptable answers	Additional guidance	Mark
	C		1

Q19.

Question Number	Acceptable answers	Additional guidance	Mark
	The only correct answer is A because, using Einstein's photoelectric equation, $hf = \phi + \frac{1}{2}mv_{\max}^2$, since the work function is constant, an increase in frequency results in an increase in the maximum kinetic energy of the photoelectrons B is not correct because, using Einstein's photoelectric equation, $hf = \phi + \frac{1}{2}mv_{\max}^2$, intensity has no effect on the maximum kinetic energy of the photoelectrons, just the rate at which they are emitted C is not correct because, using Einstein's photoelectric equation, $hf = \phi + \frac{1}{2}mv_{\max}^2$, and since the work function is equal to (the Planck constant × threshold frequency), a higher threshold frequency will lead to a lower maximum kinetic energy of the photoelectrons D is not correct because, using Einstein's photoelectric equation, $hf = \phi + \frac{1}{2}mv_{\max}^2$, a higher work function will lead to a lower maximum kinetic energy of the photoelectrons		1

Q20.

Question Number	Answers	Additional Guidance	Mark
	D	have the same frequency	(1)