

Name of the Student: _____

Max. Marks : 17 Marks

Time : 17 Minutes

Mark Schemes

Q1.

- (a) At 1Hz, individual flashes of light seen ✓
 At some frequencies the flashes appear to join to form continuous light so that no flashing seen at 40Hz ✓
 Process is called persistence of vision ✓

Need reference to change from flash to continuous around a given frequency

Allow 'sight' for 'vision'

3

- (b) (i) $(1/f = 1/u + 1/v)$ $1.75 = 1/0.250 + 1/v$ ✓
 $v = (-) 44.4 \text{ cm}$ ✓ 3 sig figs ✓

Sig fig mark stands alone. Allow 'x' for 'v'

3

- (ii) This is the (defective eye's) unaided near point ✓

Allow uncorrected near point

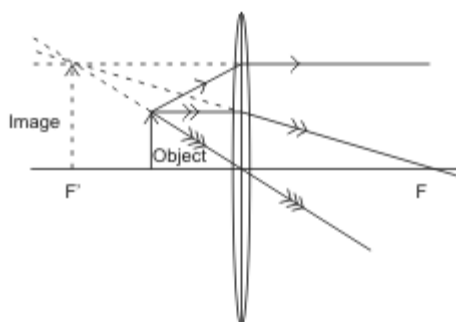
1

- (c) Long sight / presbyopia / hypermetropia ✓

1

- (d) 1 correct ray ✓
 2nd correct ray with labelled image and foci ✓

Which refers to a virtual image



2

[10]

Q2.

- (a) (i) Provide aperture through which X-rays may pass, stopping others ✓
Alternatives: provides collimation; produces narrow beam of X-rays;

protects areas of the body not being scanned

1

- (ii) Filters out (most) low energy photons (but allows high energy photons to pass through) ✓

Allow 'soft' or underpower' for low energy

Allow only high energy photons pass through

1

(b) $I / I_0 = 0.917$ ✓

$\ln(0.917) = -\mu \times 2.7 \times 10^{-3}$ ✓

$\mu = 32.1$ ✓

$\mu_m = \mu / 2700 = 0.012$ ✓

$\text{m}^2 \text{kg}^{-1}$ ✓

If 0.083 or 91.7 used, final 3 calc marks can be given

If 0.83 or 8.3 or 9.17 used, final 2 calc marks can be given

Unit mark is independent mark

5

[7]