Name of the Student:_____
Max. Marks : 19 Marks **Time : 19 Minutes**

Mark Schemes

Q1.

(a) *coherent bundle:*
fibres maintained in fixed positions relative to each other **(1)**
non-coherent bundle:
fibres have no fixed relative positions **(1)**

2

(b) coherent bundles of fibres transmit images (of internal organs of the body) **(1)**
non-coherent bundles transmit (or conduct) light
(to inside the human body for illumination) **(1)**

2

(c) (i) high resolution [or fine detail can be seen] (*)
very flexible bundle (*)
finer fibres allow bending round tighter curves without escape of light (*)
(*) any two **(1)(1)**

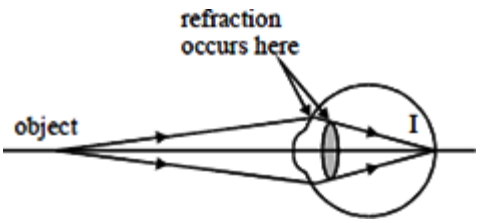
(ii) so that scratches on the outer surface do not allow light to escape **(1)**
so that close contact between adjacent fibres
[or liquid penetrating between fibres]
does not allow light to pass from one fibre to
another to ensure that image is not confused
(*alternatives* :corrupted, scrambled) as a result of
light passing between individual fibres
[or to prevent (mechanical) damage to surface of core e.g scratches]) **(1)**

4

[8]

Q2.

(a) (i)

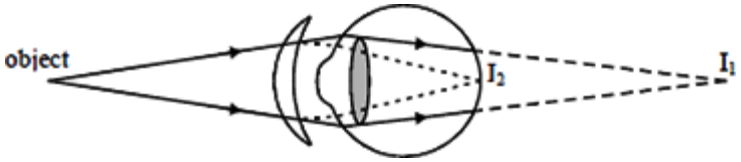


refraction at cornea and lens **(1)**
correct rays **(1)**

(ii) greatest refraction occurs at the cornea **(1)**
because greatest difference in refractive index at cornea **(1)**

(4)

(b)



converging correcting lens (accept bi-convex) **(1)**
image formed behind retina without correcting lens (labelled I_1) **(1)**
corrected image formed on retina (labelled I_2) **(1)**
dotted lines show paths of corrected rays when
converging correcting lens is used **(1)**

(4)

(c) (i) $$\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$$

$u = 0.25$
$v = -1.25$

$$\frac{1}{f} = \frac{1}{0.25} - \frac{1}{0.25}\ (\mathbf{1}) = \frac{5-1}{1.25}$$ = 3.2, power = 3.2D **(1)**

(ii) positive **(1)**

(3)

[11]