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

## Q1.

Bundles of optical fibres are described as either *coherent or non-coherent*.

(a) Describe how the fibres are arranged in each type of bundle and explain how the different designs determine their optical characteristics.

_____

_____

_____

_____

_____

_____

_____

**(2)**

(b) State an application for each type of bundle.

application of *coherent* bundle _____

_____

application of *non-coherent* bundle _____

_____

**(2)**

(c) (i) Give **two** advantages of a bundle consisting of fibres of very small diameter over a bundle consisting of larger fibres.

advantage 1 _____

_____

advantage 2 _____

_____

(ii) Give **two** reasons why a glass cladding is used around the central core of each fibre in a coherent bundle.

reason 1 _____

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_____

reason 2 _____

_____

**(4)**

**(Total 8 marks)**

## Q2.

(a) (i) Draw a **labelled** ray diagram to show how a normal eye forms an image of a near point object on the optical axis of the eye. The diagram should show the path of two rays from the object and should indicate clearly the places where refraction occurs.

(ii) Explain why most of the refraction occurs at one of these places.

_____

_____

**(4)**

(b) Draw another labelled ray diagram to show where the image of the same object would be formed by an eye suffering from the defect known as hypermetropia or “long-sight”. Indicate on your diagram how a suitable correcting lens could be used to bring the image in focus on the retina.

**(4)**

(c) A person suffering from hypermetropia has a near point at a distance of 1.25 m from her eyes.

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(i) Calculate the power of the correcting lens needed to bring her near point to 0.25 m from her eyes.

_____

_____

_____

_____

(ii) State whether this power is positive or negative.

_____

**(3)**

**(Total 11 marks)**

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