Q1.(a)   State what is meant by the principal focus and the power of a converging lens.

....

....

....

(2)

(b)   Complete the ray diagram below to show the formation of an image of a real object O by a diverging lens. Label the image clearly.
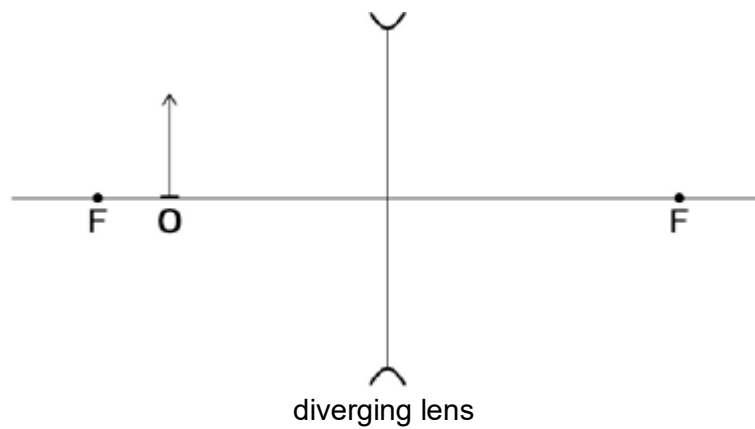
diverging lens

(2)

(c)   State the defect of vision that would be corrected using a diverging lens.

....

....

....

(1)

(d)   A diverging lens of focal length –0.33 m is used to view a real object placed 0.25 m from the lens.

Calculate the distance from the lens to the image.

distance from lens to image = _____ m

(2)

(e)   Two point sources of light are viewed by a normal eye and their images are formed at the fovea.

State, in terms of the active receptors, the conditions necessary for two separate images to be seen.

....

....

....

....

(2)
(Total 9 marks)

Q2.(a)   A person views a flashing white light source in a darkened room. Each flash lasts for 0.01 s and initially the light is flashing at a frequency of 1 Hz.
State how the person's perception of what is seen changes as the frequency at which the light flashes is slowly increased from 1 Hz to 40 Hz. Name the physiological process involved.

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physiological process involved ....

(3)

(b)   A person with a defective eye wears spectacles to see clearly a small real object. The object is placed at the aided near point of the eye, 25.0 cm from the correcting lens.
The power of the correcting lens is + 1.75 D.

(i)   Find the image distance of the image formed by the correcting lens.

Give your answer to an appropriate number of significant figures.

image distance .... cm

(3)

(ii)   State what this image distance represents.

....

....

(1)

(c)   State the defect of vision which is corrected using a converging lens.

....

(1)

(d)   Draw a labelled ray diagram below to show how the lens in part (b) forms the image of the small real object. Clearly label the image and principal foci of the lens. Your diagram does not have to be to scale.
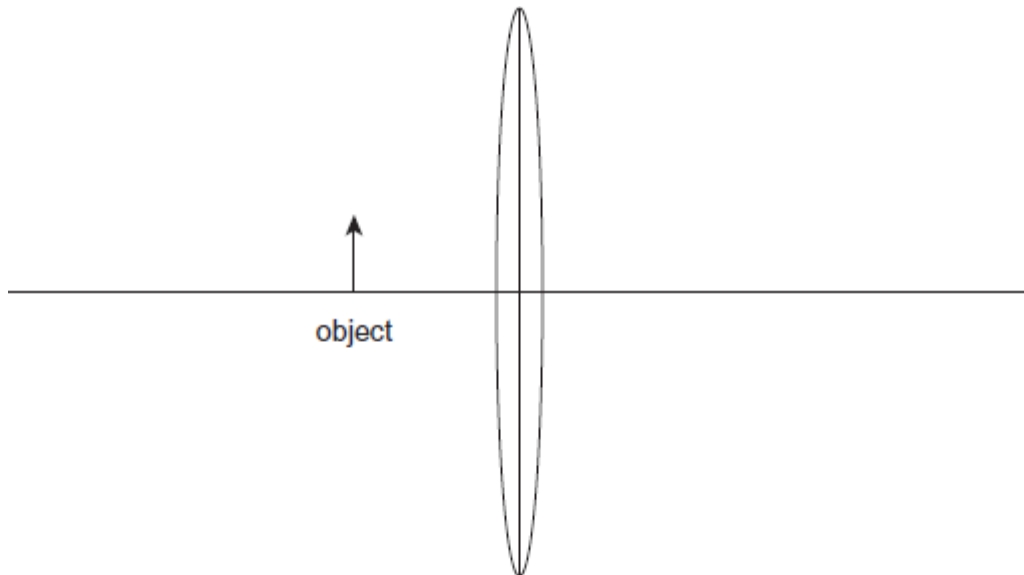
object

(2)
(Total 10 marks)

Q3.   (a)   (i)   Draw a ray diagram to show how a converging lens forms a magnified real image of a real object. Label a principal focus on your diagram.

(2)

(ii)   Draw a ray diagram to show how a converging lens forms a magnified virtual image of a real object. Label a principal focus on your diagram.

(2)

(b)   (i)   A converging lens of focal length 145 mm is used to produce an image of an object placed 112 mm from the lens.
Calculate the image distance. Give your answer to an appropriate number of significant figures.

answer = ... mm

(3)

(ii)   State **three** properties of the image.

....

....

....

(1)
(Total 8 marks)