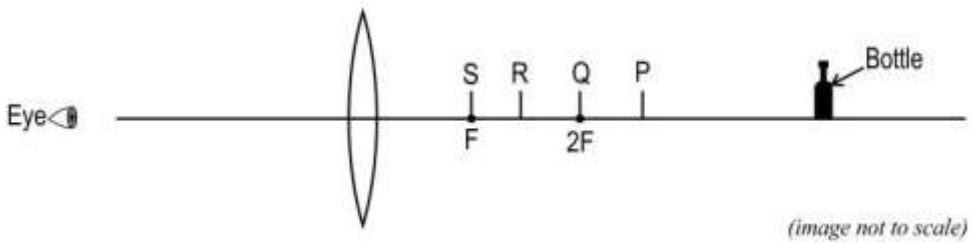
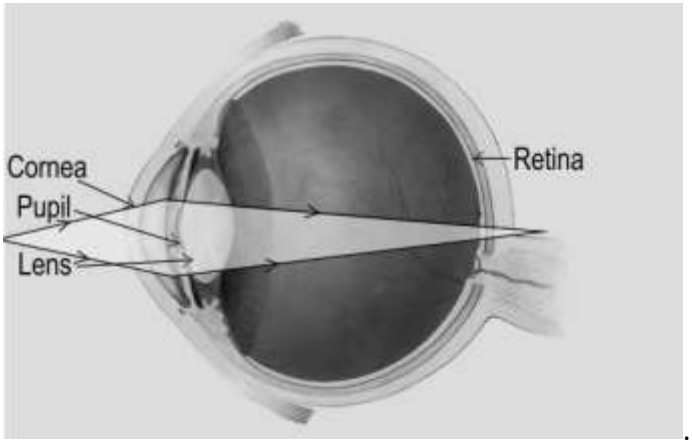
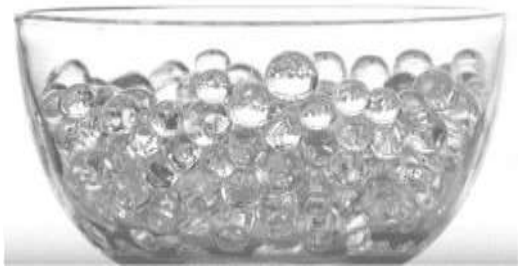
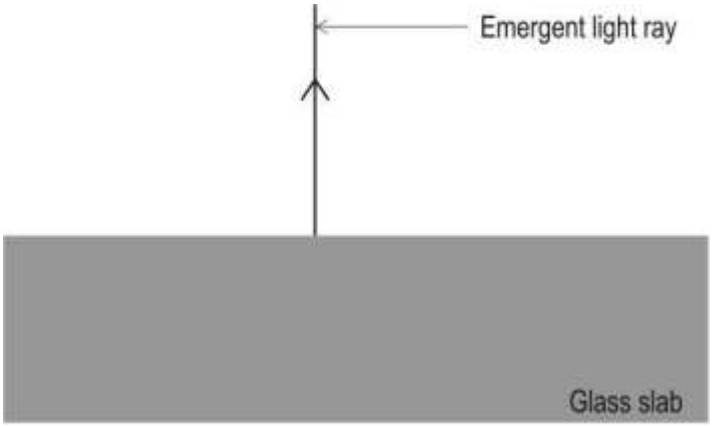
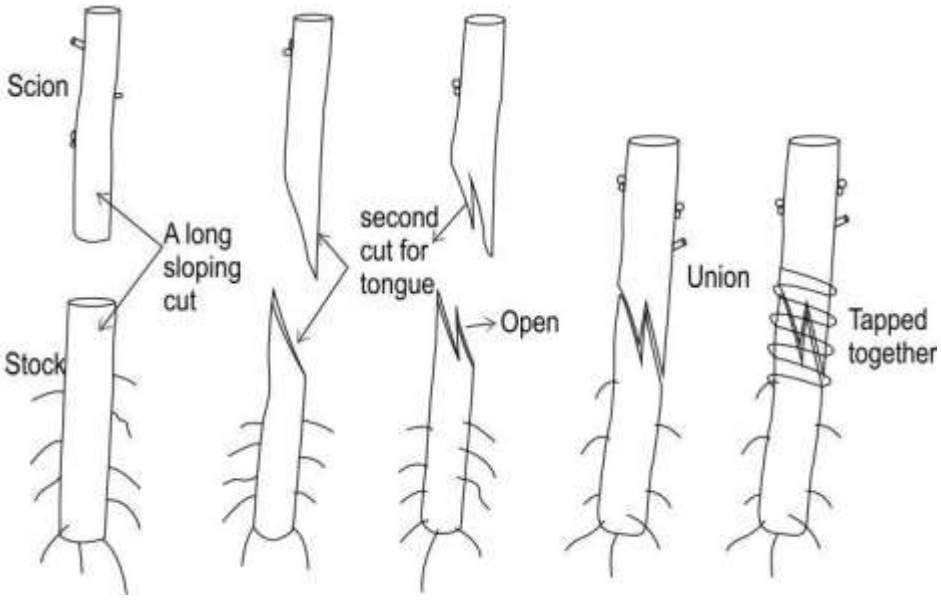
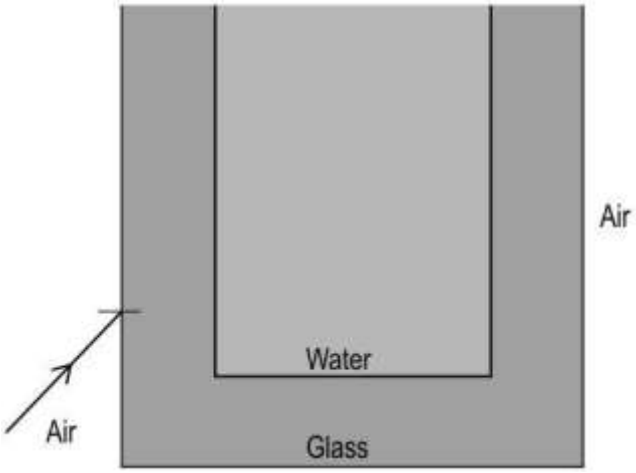
17. NATURAL PHENOMENA

Q.No	Question	Marks
	Multiple Choice Question	
Q.143	Diabetic retinopathy causes damage to blood vessels in the retina. Which of the following would NOT happen in a person having diabetic retinopathy? A. Focussing on objects at different distances B. Formation of a clear image of the object C. Change in the size of the pupil D. Entry of light into the eye	1
Q.144	A bottle is viewed through a convex lens as shown below. The bottle appears inverted at first. The bottle is now moved slowly towards the lens.  At which of the marked points will the image appear upright? A. P B. Q C. R D. S	1
Q.145	Two statements are given below - one labelled Assertion (A) and the other labelled Reason (R). Assertion (A): For making danger signals and signs that are at a distance, a colour with a longer wavelength is used. Reason (R): Colours with longer wavelengths travel faster than the other colours. Which of the following is correct? A. Both A and R are true, and R is the correct explanation for A. B. Both A and R are true, but R is not the correct explanation for A. C. A is true, but R is false.	1

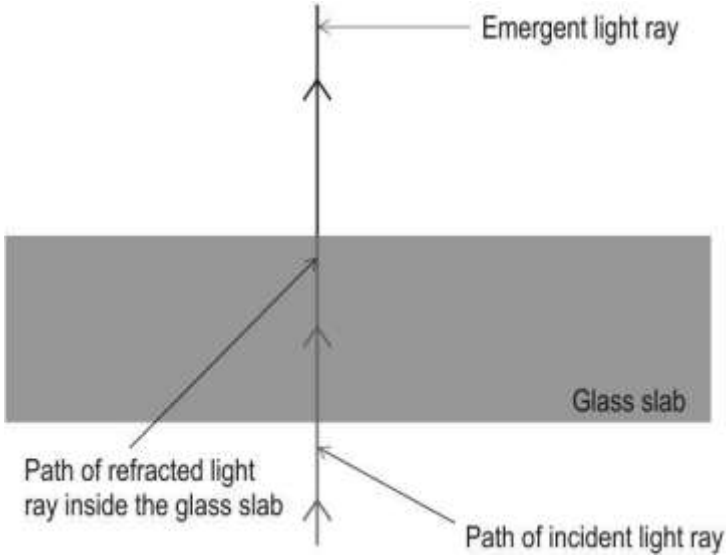
	D. A is false, but R is true.	
Free response question/Subjective Question		
Q.146	The image given below indicates defective vision in Ram.  . (a) Based on the given information, what could be the nature of the eye defect? (b) State the type of lens to be used to correct his vision. Justify your choice. (c) The near point of Ram's eye is 75 cm. Calculate the focal length and power of the lens he should use while reading a book kept at a distance of 25 cm from the eye.	5
Q.147	Neeti took some clear gel beads and soaked them in water for a few hours. The gel beads absorbed water and increased in size. She then placed these beads in a glass container. The beads were clearly visible in the container as shown below.  Neeti then added water to the container and it appeared as shown below.  (a) Why are the gel beads not visible on adding water?	2

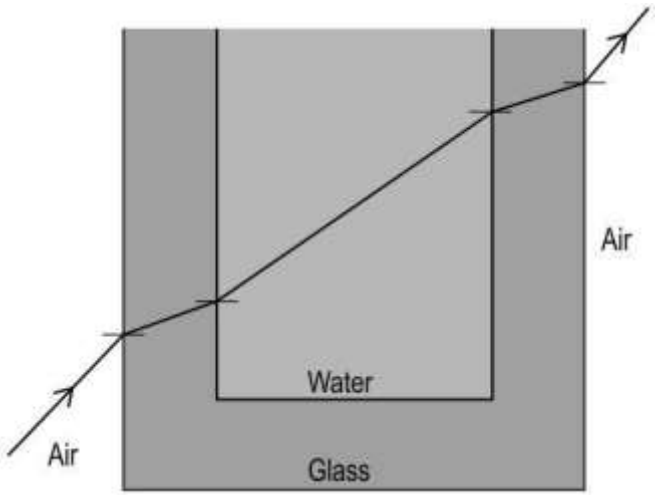
	(b) Would the gel beads shown in the first image be visible if placed in oil instead of water? Give a reason for your answer.	
Q.148	The ray of light emerging from a rectangular glass slab into air is shown in the diagram below.  Copy the diagram and draw the path of the same light ray as it enters from air and passes through the glass slab.	2
Q.149	The ozone layer absorbs harmful ultraviolet rays. Chlorine released by certain substances such as chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) contributes to ozone depletion. Large volcanic eruptions produce large amounts of tiny particles called aerosols, which increase chlorine's effectiveness in destroying ozone. State one possible reason why erupting volcanoes, though increasing chlorine's effectiveness at destroying ozone, do not pose a serious threat to the ozone layer.	1
Q.150	Ajay took a stem cutting (scion) from a red rose plant and a stem (stock) from a white rose plant. After cutting both the stems, he arranged and tied them as shown below.  	2

	(a) Name the type of asexual reproduction seen here. (b) What will be the colour of the roses that will be produced in the new plant?	
Q.151	State TWO points of similarities between the processes of reproduction in hydra and bryophyllum.	2
Q.152	A concave lens has a power of -2.0D. It forms an image of an object at a distance of 10 cm from the lens. (a) Find the distance of the object from the lens. (b) Find the magnification produced.	4
Q.153	A light ray is incident on the wall of a glass tank as shown below.  Draw a rough diagram of the path of the light ray as it passes through the glass tank and the water and emerges again ito air. Draw the normal at each interface.	3
Q.154	While walking along the riverbank, Trupti found a smooth, milky white stone. When a ray of sunlight fell upon it, she observed that the stone appeared bluish in colour and the light that passed through it appeared orange in colour. (a) Identify the phenomenon that Trupti observed as sunlight fell upon the stone. (b) How would the size of the stone particles compare to the wavelength of visible light?	2

Answer Key and Marking Scheme

Q. No	Answers	Marks
Q.143	B. Formation of a clear image of the object	1
Q.144	D. S	1
Q.145	B. Both A and R are true, but R is not the correct explanation for A.	1
Q.146	(a) The nature of the eye defect is hypermetropia. (1 mark for correct answer) (b) 1 mark for each point -The type of lens to be used to correct his vision is a convex lens. - The image of a nearby object is being formed behind the retina and by using a convex lens the light rays can be converged further causing the image to be focused correctly on the retina. (c)0.5 mark for the formula, 0.5 mark for the final answer $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$ $\frac{1}{f} = \frac{1}{-75} - \frac{1}{-25}$ $\frac{1}{f} = -\frac{1}{75} + \frac{1}{25}$ $f = 20cm$ For distant vision, The focal length is p= 1/f p= 100/20 p= 5 D	5
Q.147	(a) The water-filled gel beads have nearly the same refractive index as water and hence light does not bend as it moves from water to the beads. (b) The gel beads would be visible when placed in oil, as the refractive index of water is different from that of the oil.	2
Q.148	1 mark for drawing the incident ray entering the glass slab and 1 mark for drawing the refracted ray as it passes through the glass slab:	2

		
Q.149	Volcanic eruptions do not occur frequently.	1
Q.150	(a) It is also called vegetative propagation/grafting. (b)The new plant would produce red flowers.	2
Q.151	(1 mark for each point) - The offspring that are produced are genetically identical to the parent. -Single parent is involved in the process of reproduction. (Accept any other valid points)	2
Q.152	(a) Power of lens D = -2.0 = 1/f f = -1/2 = -50 cm [1 mark] lens formula 1/v -1/u = 1/f [1 mark] 1/u = 1/v -1/f = 1/-10 - (1/-50) = -5 - (-1) / 50 = -4/50 u = 50/-4 = -12.5 cm [1 mark] (b) magnification =v/u = -10/-12.5 =0.8	4

Q.153	 (0.5 marks each for drawing the rays correctly at each interface. 1 Mark for drawing the normal at each interface.)	3
Q.154	(a) scattering of light (b) The stone particles would be smaller than the wavelength of visible light.	2