

Strictly Confidential- (For Internal and Restricted Use Only) Secondary School Examination
SUMMATIVE ASSESSMENT - II
July 2017

Marking Scheme – Science (Delhi) 31/1/1

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2. Evaluation is to be done as per instructions provided in the Marking Scheme. It should not be done according to one's own interpretation or any other consideration. Marking Scheme should be strictly adhered to and religiously followed.
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5. If a candidate has attempted an extra question, marks obtained in the question attempted first should be retained and the other answer should be scored out.
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7. There should be no effort at 'moderation' of the marks by the evaluating teachers. The actual total marks obtained by the candidate may be of no concern of the evaluators.
8. All the Head Examiners / Examiners are instructed that while evaluating the answer scripts, if the answer is found to be totally incorrect, the (X) should be marked on the incorrect answer and awarded '0' marks.
9. $\frac{1}{2}$ mark may be deducted if a candidate either does not write units or writes wrong units in the final answer of a numerical problem.
10. A full scale of mark 0 to 100 has to be used. Please do not hesitate to award full marks if the answer deserves it.
11. As per orders of the Hon'ble Supreme Court the candidates would now be permitted to obtain photocopy of the Answer Book on request on payment of the prescribed fee. All Examiners/Head Examiners are once again reminded that they must ensure that evaluation is carried out strictly as per value points given in the marking scheme.

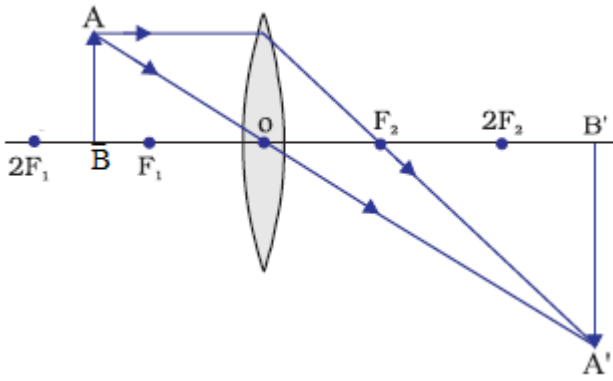
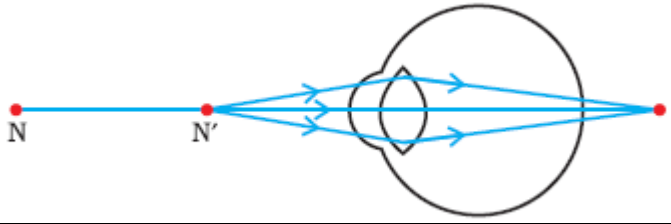
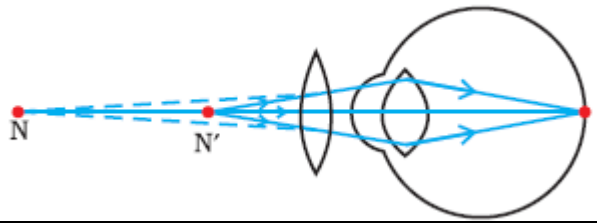
MARKING SCHEME
CLASS X – DELHI

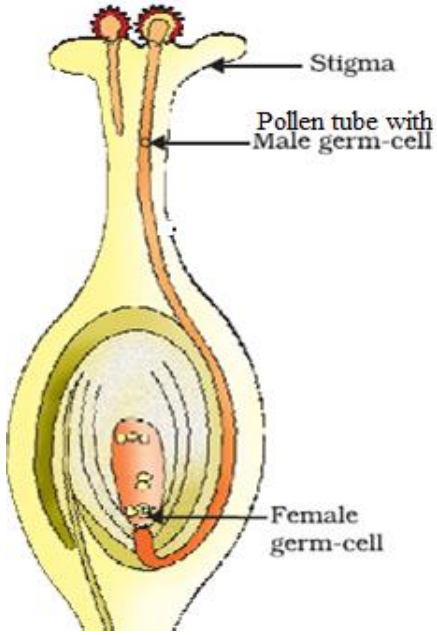
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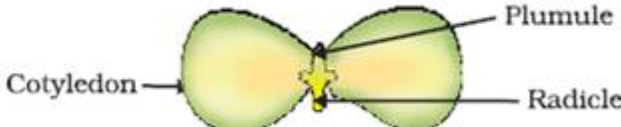
	Expected Answer/ Value point	Marks	Total
SECTION – A			
Q 1.	(i) CH ₄ (ii) C ₂ H ₅ OH / C ₂ H ₆ O	½, ½	1
Q2.	Torches, Searchlights, headlights of vehicles etc. (any two)	½, ½	1
Q3.	River, Pond, Forest, Ocean etc. (any two)	½, ½	1
Q4.	<ul style="list-style-type: none"> Properties of elements are a periodic function of their atomic number. 18 groups and 7 periods. 	1 ½, ½	2
Q5.	<ul style="list-style-type: none"> Size of image is equal to size of object Erect Virtual Laterally inverted Object distance is equal to image distance 		
	(any four)	½ x 4	2
Q6.	Ozone is a molecule formed by three atoms of oxygen./ Ozone is a gas present in the outer atmosphere which protects us from UV radiations.	1	
	Chlorofluorocarbons/ CFCs	1	2
Q7.	(i) Suffering from myopia/ shortsightedness; using spectacles having concave lenses of appropriate focal length.	½, ½	
	(ii) Concave lenses	1	
	(iii) Teacher is concerned and knowledgeable (any one)	½	
	Sudhir is helpful as well as concerned (any one)	½	3
	(or any other value)		
Q8.	<ul style="list-style-type: none"> The phenomenon in which a part of the light incident on a particle is redirected in different directions. When sunlight passes through the atmosphere, its fine particles scatter the blue colour more strongly than red. The scattered blue light enters our eyes. Hence the sky appears blue. 	1 2	3
Q9.	$u = -12\text{cm}, \quad f = +8\text{cm}, \quad v = ?$		
	$\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$	½	
	$\frac{1}{v} - \frac{1}{(-12)} = \frac{1}{8}$	1	

	$v = +24\text{cm}$		1	
	Real/ inverted.		$\frac{1}{2}$	3
Q10.	<ul style="list-style-type: none"> The relative extent to which the image of an object is magnified with respect to object size./ It is the ratio of size of the image to the size of the object. 		1	
	<ul style="list-style-type: none"> $v = -40\text{cm}$, $u = -20\text{cm}$, $f = ?$ 		$\frac{1}{2}$	
	$\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$		$\frac{1}{2}$	
	$\frac{1}{f} = \frac{1}{-40} + \frac{1}{-20}$		$\frac{1}{2}$	
	$f = \frac{-40}{3}\text{cm}$		$\frac{1}{2}$	3
Q11.	i) 2, 8, 2 Valency : 2		$\frac{1}{2}, \frac{1}{2}$	
	ii) <ul style="list-style-type: none"> Metal There are two electrons in its outermost shell and it easily loses them to form a positive ion. 		$\frac{1}{2}$	
	iii) <ul style="list-style-type: none"> MO Basic 		$\frac{1}{2}$	3
Q12.	(i) Atomic radius decreases		$\frac{1}{2}$	
	Reason: Nuclear charge increases which tends to pull the electrons closer to the nucleus.		1	
	(ii) Atomic radius increases		$\frac{1}{2}$	
	Reason: Number of shells increases on going down the group.		1	3
Q13	<ul style="list-style-type: none"> A group of organic compounds having the same functional group and similar structures in which any two successive members differ by $-\text{CH}_2$. <ul style="list-style-type: none"> i) All members have similar chemical properties ii) There is gradation in the physical properties. 		1	
	(or any other)		$\frac{1}{2}$	
	<ul style="list-style-type: none"> Name – Ethanoic acid/ Acetic acid Formula – CH_3COOH 		$\frac{1}{2}$	3
Q14.	(a) i) Testis – Formation of sperm / germ cells // secretion of testosterone			
	ii) Vas deferens – Delivery of sperms from testis to urethra			
	iii) Urethra – Ejaculation of sperms			
	iv) Prostate – Its secretions nourishes the sperms.		$\frac{1}{2} \times 4$	
	(b) Thick hair growth on the face, voice begins to crack, hair growth in armpits (or any other)		$\frac{1}{2}, \frac{1}{2}$	3
Q15.	Inherited Traits	Acquired Traits		
	Changes or characters in the reproductive tissues only can be passed on to the DNA of the germ	Changes in non – reproductive tissues cannot be passed on to the DNA of the germ cells / next generation	$\frac{1}{2}, \frac{1}{2}$	

	cells / next generation.			
	Example: Tails of mice/ skin colour	Example: Life time experiences/ tanning of skin when exposed to sun (or any other example)	1/2, 1/2	
	Reason – Change in non-reproductive tissues cannot be passed on to the DNA of the germ cells.		1	3
Q16.	Asexual Reproduction – Mode of reproduction used by single organisms		1	
	A bud develops as an outgrowth due to repeated cell division of reproductive cells at one specific site. These buds develop into tiny individuals, and when fully mature, detach from the parent body as new independent individuals.		1/2 x 4	3
Q17.	Long thread like structures made of DNA.		1	
	In sexually reproducing organisms gametes are formed which have only half the number of chromosomes/ DNA as compared to non-reproductive body cells. The gametes fuse to form a zygote resulting in re-establishment of the number of chromosomes in the progeny.		2	3
Q18.	Three methods of contraception			
	(i) Barrier method or mechanical method/ condom/ diaphragm; to prevent the meeting of sperms and ova. (ii) Chemical method/ oral pills; changes the hormonal balance of the female so that the eggs are not released. (iii) Surgical method; to block the vas deferens in males/ vasectomy or the fallopian tube (oviduct) in females/ tubectomy, to prevent the transfer of sperms or egg and hence no fertilization takes place. (iv) IUCDs/ Loop or the Copper-T placed in the uterus; to prevent pregnancy. (Any three methods)		Listing Reasoning	3x1/2 3x 1/2
				3
Q19.	(a) (i)			
				2

	(ii) 			2	
	(b) Image formed is virtual, erect and diminished in both cases.			1	5
Q20.	<ul style="list-style-type: none"> Hypermetropia Defective eye 			1	
				1	
	<ul style="list-style-type: none"> Two causes: <ol style="list-style-type: none"> the focal length of the eye lens is too long the eyeball has become too small. 			1	
	<ul style="list-style-type: none"> Correction of the defect using appropriate lens 				
				1	5
Q21.	a) i)				
		$\text{CH}_3-\text{CH}_2\text{OH} \xrightarrow[\text{Or acidified K}_2\text{Cr}_2\text{O}_7 + \text{Heat}]{\text{Alkaline KMnO}_4 + \text{Heat}} \text{CH}_3\text{COOH}$		1	
	ii)	$\begin{array}{c} \text{R} \quad \text{R} \\ \diagdown \quad / \\ \text{C} = \text{C} \\ / \quad \diagdown \\ \text{R} \quad \text{R} \end{array} \xrightarrow[\text{H}_2]{\text{Ni / Pd}} \begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{R}-\text{C}-\text{C}-\text{R} \\ \quad \\ \text{R} \quad \text{R} \end{array}$		1	
	iii)	$\text{CH}_4 + \text{Cl}_2 \xrightarrow{\text{Sunlight}} \text{CH}_3\text{Cl} + \text{HCl}$		1	
		(or any other chemical equation)			
	b)	<ul style="list-style-type: none"> An alcohol having two carbon atoms in its molecule / $\text{C}_2\text{H}_5\text{OH}$ Ethene is formed Dehydrating agent 		1	
				$\frac{1}{2}$	
				$\frac{1}{2}$	5

Q22.	(i)	<ul style="list-style-type: none"> • In of the Mendel's experiments when (Pure) tall pea plants were crossed with (Pure) dwarf pea plants, only tall pea plants were obtained in the F₁ generation. 	1	
		<ul style="list-style-type: none"> • On selfing the F₁ generation pea plants, both tall and dwarf plants were obtained in F₂ generation. 	1/2	
		<ul style="list-style-type: none"> • Appearance of tall character in F₁ and F₂ generation shows that the tallness is the dominant character and dwarfness which could not appear in F₁ but appeared in F₂, is a recessive character. 	1	
	(ii)	<ul style="list-style-type: none"> • When Mendel crossed tall pea plants with round seeds and a dwarf pea plant with wrinkled seeds, the F₁ progeny plants were all tall with round seeds. 	1	
		<ul style="list-style-type: none"> • On self-pollination of F₁ plants the F₂ progeny consisted of both parental characters (tall plants with round seeds and dwarf plants with wrinkled seeds) as well as new combinations like tall plants with wrinkled seeds and dwarf plants with round seeds. 	1	
		<ul style="list-style-type: none"> • Thus, it may be concluded that tall and dwarf traits and round and wrinkled have been inherited independently <p>OR</p> <p>A flow chart depicting the same</p>	1/2	5
		Note: Any other contrasting characters may be taken.		
Q23.	(a)	Pollination – Process of transfer of pollen grains from the anther to the stigma of the flower	1	
		Two types – Self-pollination and Cross pollination	1/2, 1/2	
	(b)	 <p style="text-align: right;">Diagram Three labellings</p>	1 1/2 1/2 x 3	5
Q24.	(a)	Sustainable development: Development which meets the current basic human needs, while preserving the resources for the needs of future generation.	1	
		It is necessary for environmental conservation.	1	

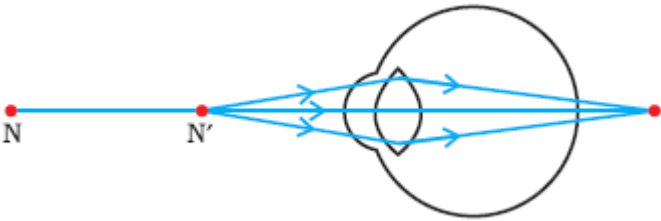
	(b) Water harvesting – It is a method to capture every trickle of water that falls on the land.		1	
	Four benefits –			
	(i) Recharges wells/ Ground water (ii) Provides moisture for vegetation (iii) It is not lost by evaporation (iv) It does not provide a breeding place for mosquitoes (v) Prevents ground water from contamination due to human and animal wastes. (any four)		$\frac{1}{2} \times 4$	5
SECTION – B				
	25) Give full credit to all answers	26) C	27) A	
	28) C	29) C	30) C	
	31) B	32) A	33) C	
			1×9	9
Q34.	On adding soap solution lather will be formed in the beaker containing soft water only.		1	
	On adding detergent solution lather will be formed by both hard and soft water / in both the beakers.		1	2
Q35.	A colourless gas with brisk effervescence is evolved.		1	
	Lime water turns milky when this gas is passed through it.		1	2
Q36.	 <p style="text-align: right;">Diagram Three labellings</p>		$\frac{1}{2}$ $\frac{1}{2} \times 3$	2

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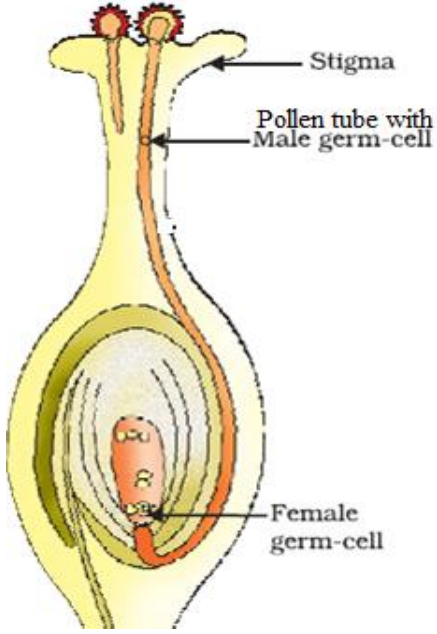
Marking Scheme – Science (Delhi) 31/1/2

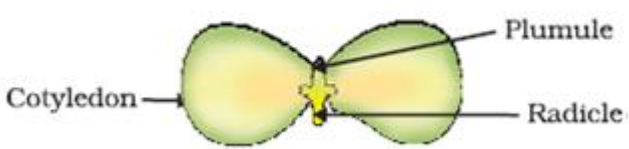
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	Four advantages:			
	i) Plants can bear flowers and fruits earlier than those produced from seeds ii) Plants that have lost the capacity to produce viable seeds can be grown. iii) Plants grown are genetically similar/ clones of the parent plant iv) Economical, quick and easy method		½ x 4	3
Q11.	Three methods of contraception			
	(i) Barrier method or mechanical method/ condom/ diaphragm; to prevent the meeting of sperms and ova. (ii) Chemical method/ oral pills; changes the hormonal balance of the female so that the eggs are not released. (iii) Surgical method; to block the vas deferens in males/ vasectomy or the fallopian tube (oviduct) in females/ tubectomy, to prevent the transfer of sperms or egg and hence no fertilization takes place. (iv) IUCDs/ Loop or the Copper-T placed in the uterus; to prevent pregnancy. (Any three methods)		Listing 3x½ Reasoning 3x ½	3
Q12.	Inherited Traits	Acquired Traits		
	Changes or characters in the reproductive tissues only can be passed on to the DNA of the germ cells / next generation.	Changes in non – reproductive tissues cannot be passed on to the DNA of the germ cells / next generation	½, ½	
	Example: Tails of mice/ skin colour	Example: Life time experiences/ tanning of skin when exposed to sun (or any other example)	½, ½	
	Reason – Change in non–reproductive tissues cannot be passed on to the DNA of the germ cells.		1	3
Q13.	Long thread like structures made of DNA.		1	
	In sexually reproducing organisms gametes are formed which have only half the number of chromosomes/ DNA as compared to non-reproductive body cells. The gametes fuse to form a zygote resulting in re-establishment of the number of chromosomes in the progeny.		2	3
Q14.	i) Ovary: Produces egg or female gamete, female sex hormone/ estrogen ii) Fallopian tube: Transfer of ovum to the uterus, Site for fertilization iii) Uterus: Site of implantation of zygote, development of embryo.		½, ½ ½, ½ ½, ½	3
Q15.	$f = +18\text{cm}, \quad u = -27\text{cm}, \quad v = ?$			
	$\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$		½	
	$\frac{1}{18} = \frac{1}{v} - \frac{1}{(-27)}$		1	
	$v = 54\text{cm}$		1	
	Real/ inverted.		½	3

Q16.	<ul style="list-style-type: none"> The relative extent to which the image of an object is magnified with respect to object size./ It is the ratio of size of the image to the size of the object. 	1	
	<ul style="list-style-type: none"> $v = -40\text{cm}$, $u = -20\text{cm}$, $f = ?$ 	$\frac{1}{2}$	
	$\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$	$\frac{1}{2}$	
	$\frac{1}{f} = \frac{1}{-40} + \frac{1}{-20}$	$\frac{1}{2}$	
	$f = \frac{-40}{3}\text{cm}$	$\frac{1}{2}$	3
Q17.	<ul style="list-style-type: none"> Since the atmosphere consists of varying densities the apparent position of the object, as seen through the hot air fluctuates. This wavering of light is an effect of atmospheric refraction. 	1	
	<ul style="list-style-type: none"> The twinkling of a star is due to atmospheric refraction of star light. The atmospheric refraction of light occurs in a medium of gradually changing refractive index. <p>The planets are much closer to the earth and are thus seen as extended sources. A planet is considered as a collection of large number of point sized sources of light, the total variation in the amount of light entering our eye from all individual point sized sources will average out to zero, thereby nullifying the twinkling effect.</p>	2	3
Q18.	(i) Suffering from myopia; using spectacles having concave lenses of appropriate focal length.	$\frac{1}{2}, \frac{1}{2}$	
	(ii) Concave lenses	1	
	(iii) Teacher is concerned and knowledgeable (any one)	$\frac{1}{2}$	
	Sudhir is helpful as well as concerned (any one)	$\frac{1}{2}$	3
	(or any other value)		
Q19.	<ul style="list-style-type: none"> Hypermetropia/ Longsightedness 	1	
	<ul style="list-style-type: none"> Defective eye 	1	
	<ul style="list-style-type: none"> Two causes: 		
	i) the focal length of the eye lens is too long	1	
	ii) the eyeball has become too small.	1	
	<ul style="list-style-type: none"> Correction of the defect using appropriate lens 	1	5

Q20.	(a) (i)		2	
	(ii)		2	
	(b)	Image formed is virtual, erect and diminished in both cases.	1	5
Q21.	(i)	<ul style="list-style-type: none"> • In of the Mendel's experiments when (Pure) tall pea plants were crossed with (Pure) dwarf pea plants, only tall pea plants were obtained in the F₁ generation. 	1	
		<ul style="list-style-type: none"> • On selfing the F₁ generation pea plants, both tall and dwarf plants were obtained in F₂ generation. 	1/2	
		<ul style="list-style-type: none"> • Appearance of tall character in F₁ and F₂ generation shows that the tallness is the dominant character and dwarfness which could not appear in F₁ but appeared in F₂, is a recessive character. 	1	
	(ii)	<ul style="list-style-type: none"> • When Mendel crossed tall pea plants with round seeds and a dwarf pea plant with wrinkled seeds, the F₁ progeny plants were all tall with round seeds. 	1	
		<ul style="list-style-type: none"> • On self-pollination of F₁ plants the F₂ progeny consisted of both parental characters (tall plants with round seeds and dwarf plants with wrinkled seeds) as well as new combinations like tall plants with wrinkled seeds and dwarf plants with round seeds. 	1	
		<ul style="list-style-type: none"> • Thus, it may be concluded that tall and dwarf traits and round and wrinkled have been inherited independently <p>OR</p>	1/2	5

	A flow chart depicting the same		
	Note: Any other contrasting characters may be taken.		
Q22.	(a) Pollination – Process of transfer of pollen grains from the anther to the stigma of the flower	1	
	Two types – Self-pollination and Cross pollination	½, ½	
	(b)		
		Diagram	1 ½
		Three labellings	½ x 3
			5
Q23.	(a) Sustainable development: Development which meets the current basic human needs, while preserving the resources for the needs of future generation.	1	
	It is necessary for environmental conservation.	1	
	(b) Water harvesting – It is a method to capture every trickle of water that falls on the land.	1	
	Four benefits –		
	(i) Recharges wells/ Ground water (ii) Provides moisture for vegetation (iii) It is not lost by evaporation (iv) It does not provide a breeding place for mosquitoes (v) Prevents ground water from contamination due to human and animal wastes.	(any four)	½ x 4
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Q24.	a) i)		
	$\text{CH}_3-\text{CH}_2\text{OH} \xrightarrow[\text{Or acidified K}_2\text{Cr}_2\text{O}_7, + \text{Heat}]{\text{Alkaline KMnO}_4 + \text{Heat}} \text{CH}_3\text{COOH}$	1	
	ii)		
	$\begin{array}{c} \text{R} \quad \quad \text{R} \\ \diagdown \quad \diagup \\ \text{C} = \text{C} \\ \diagup \quad \diagdown \\ \text{R} \quad \quad \text{R} \end{array} \xrightarrow[\text{H}_2]{\text{Ni / Pd}} \begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{R}-\text{C}-\text{C}-\text{R} \\ \quad \\ \text{R} \quad \text{R} \end{array}$	1	

	iii) $\text{CH}_4 + \text{Cl}_2 \xrightarrow{\text{Sunlight}} \text{CH}_3\text{Cl} + \text{HCl}$		1		
	(or any other chemical equation)				
	b) • An alcohol having two carbon atoms in its molecule / $\text{C}_2\text{H}_5\text{OH}$		1		
	• Ethene is formed		$\frac{1}{2}$		
	• Dehydrating agent		$\frac{1}{2}$	5	
	SECTION – B				
	25) C	26) C	27) A		
	28) C	29) B	30) C		
	31) C	32) Give full credit to all answers	33) A	1 × 9 = 9	
Q34.	 <p style="text-align: right;">Diagram Three labellings</p>			$\frac{1}{2}$	
				$\frac{1}{2} \times 3 = 2$	
Q35.	On adding soap solution lather will be formed in the beaker containing soft water only.		1		
	On adding detergent solution lather will be formed by both hard and soft water / in both the beakers.		1	2	
Q36.	A colourless gas with brisk effervescence is evolved.		1		
	Lime water turns milky when this gas is passed through it.		1	2	

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11. As per orders of the Hon'ble Supreme Court the candidates would now be permitted to obtain photocopy of the Answer Book on request on payment of the prescribed fee. All Examiners/Head Examiners are once again reminded that they must ensure that evaluation is carried out strictly as per value points given in the marking scheme.

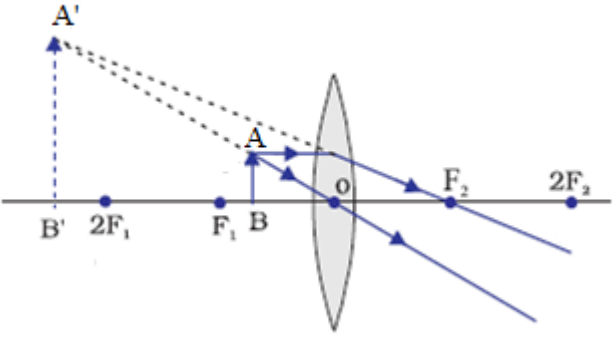
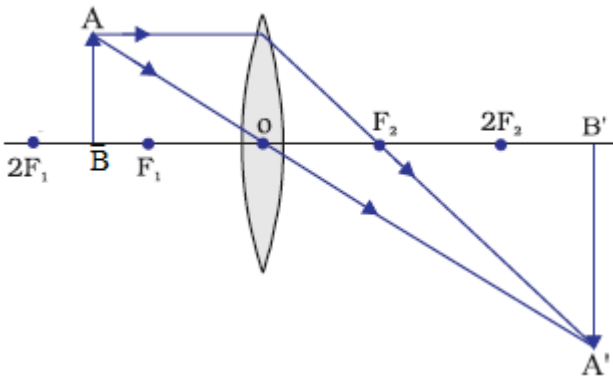
MARKING SCHEME
CLASS X – DELHI

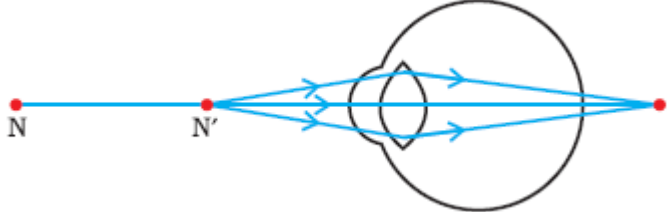
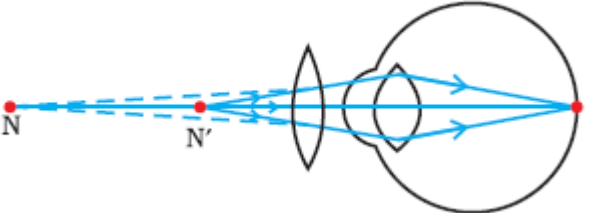
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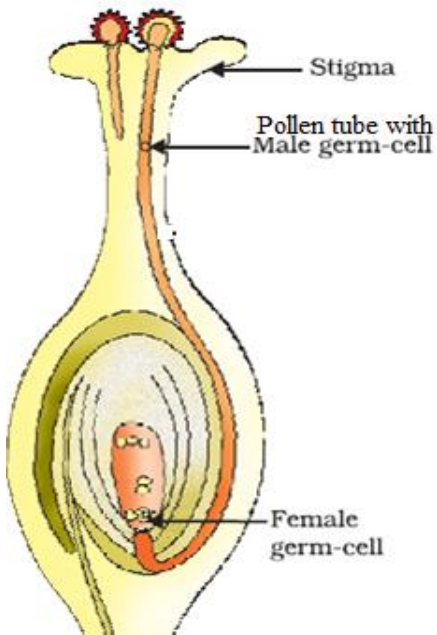
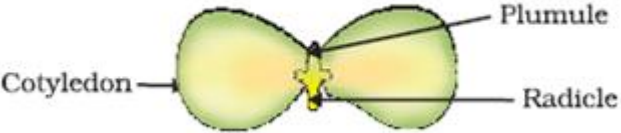
	Expected Answer/ Value point	Marks	Total
SECTION – A			
Q 1.	It shields the surface of the earth from ultraviolet (UV) radiation from the sun.	1	1
Q2.	i) Methane	½	
	ii) Ethanoic acid/ Acetic acid	½	1
Q3.	Line joining the pole and the centre of curvature of a spherical mirror.	1	1
Q4.	i) The incident ray, the refracted ray and the normal to the interface of two transparent media at the point of incidence, all lie in the same plane.	1	
	ii) The ratio of sine of angle of incidence to the sine of angle of refraction is a constant, for the light of a given colour and for the given pair of media.	1	2
Q5.	Group: 17		
	Period: 3		
	Electronic configuration: 2, 8, 7		
	Valency: $8 - 7 = 1$	½ x 4	2
Q6.	Bacteria and fungi break down/ decompose the dead remains and waste products of organisms.	1	
	Advantages:		
	i) Natural replenishment of soil		
	ii) Recycling of nutrients in the soil	½+ ½	2
Q7.	Reproduction: It is a (biological) process by which new individuals of the same species are produced by the existing organisms.	1	
	Advantages of sexual reproduction		
	i) Leads to stability of population of species	1	
	ii) Results in variations useful for the survival of species over time.	1	3
Q8.	Changes in fertilized egg:		
	• Zygote / fertilized egg starts dividing		
	• Implantation of zygote in the inner uterine wall		
	• Embryo starts growing with the help of the placenta which results in the development of the child.		
	• Birth of a child as a result of rhythmic contraction of the muscles in the uterus	½ x 4	
	• When egg is not fertilized, the inner lining of the uterus slowly breaks and comes out through the vagina as blood and mucous (Menstruation)	1	3

Q9.	Three methods of contraception		
	(i) Barrier method or mechanical method/ condom/ diaphragm; to prevent the meeting of sperms and ova. (ii) Chemical method/ oral pills; changes the hormonal balance of the female so that the eggs are not released. (iii) Surgical method; to block the vas deferens in males/ vasectomy or the fallopian tube (oviduct) in females/ tubectomy, to prevent the transfer of sperms or egg and hence no fertilization takes place. (iv) IUCDs/ Loop or the Copper-T placed in the uterus; to prevent pregnancy. (Any three methods) Listing Reasoning	3x½ 3x ½	3
Q10.	Long thread like structures made of DNA.	1	
	In sexually reproducing organisms gametes are formed which have only half the number of chromosomes/ DNA as compared to non-reproductive body cells. The gametes fuse to form a zygote resulting in re-establishment of the number of chromosomes in the progeny.	2	3
Q11.	Inherited Traits	Acquired Traits	
	Changes or characters in the reproductive tissues only can be passed on to the DNA of the germ cells / next generation.	Changes in non – reproductive tissues cannot be passed on to the DNA of the germ cells / next generation	½, ½
	Example: Tails of mice/ skin colour	Example: Life time experiences/ tanning of skin when exposed to sun (or any other example)	½, ½
	Reason – Change in non–reproductive tissues cannot be passed on to the DNA of the germ cells.		1 3
Q12.	• The relative extent to which the image of an object is magnified with respect to object size./ It is the ratio of size of the image to the size of the object.	1	
	• $v = -40\text{cm}$, $u = -20\text{cm}$, $f = ?$	½	
	$\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$	½	
	$\frac{1}{f} = \frac{1}{-40} + \frac{1}{-20}$	½	
	$f = \frac{-40}{3}\text{cm}$	½	3
Q13.	$f = +14\text{cm}$, $u = -21\text{cm}$, $v = ?$		
	$\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$	½	

	$\frac{1}{v} - \frac{1}{(-21)} = \frac{1}{14}$	1	
	$v = +42\text{cm}$	1	
	Real/ inverted.	$\frac{1}{2}$	3
Q14.	Light from the sun overhead would travel relatively shorter distance. At noon, sun appears white as only little of the blue and violet colours are scattered. However, near the horizon most of the blue light and shorter wavelength are scattered away by the particles. Therefore, the light that reaches our eyes is of longer wavelength which gives rise to the reddish appearance of Sun.	3	3
Q15.	(i) Suffering from myopia; using spectacles having concave lenses of appropriate focal length.	$\frac{1}{2}, \frac{1}{2}$	
	(ii) Concave lenses	1	
	(iii) Teacher is concerned and knowledgeable (any one)	$\frac{1}{2}$	
	Sudhir is helpful as well as concerned (any one)	$\frac{1}{2}$	3
	(or any other value)		
Q16.	i) 2, 8, 2 Valency : 2	$\frac{1}{2}, \frac{1}{2}$	
	ii) • Metal	$\frac{1}{2}$	
	• There are two electrons in its outermost shell and it easily loses them to form a positive ion.	$\frac{1}{2}$	
	iii) • MO	$\frac{1}{2}$	
	• Basic	$\frac{1}{2}$	3
Q17.	(i) Atomic radius decreases	$\frac{1}{2}$	
	Reason: Nuclear charge increases which tends to pull the electrons closer to the nucleus.	1	
	(ii) Atomic radius increases	$\frac{1}{2}$	
	Reason: Number of shells increases on going down the group.	1	3
Q18	• A group of organic compounds having the same functional group and similar structures in which any two successive members differ by $-\text{CH}_2$.	1	
	• i) All members have similar chemical properties	$\frac{1}{2}$	
	ii) There is gradation in the physical properties.	$\frac{1}{2}$	
	(or any other)		
	• Name – Ethanoic acid/ Acetic acid	$\frac{1}{2}$	
	Formula – CH_3COOH	$\frac{1}{2}$	3
Q19.	a) i)		
	$\text{CH}_3-\text{CH}_2\text{OH} \xrightarrow[\text{Or acidified K}_2\text{Cr}_2\text{O}_7 + \text{Heat}]{\text{Alkaline KMnO}_4 + \text{Heat}} \text{CH}_3\text{COOH}$	1	
	ii)		
	$\begin{array}{c} \text{R} \quad \quad \text{R} \\ \diagdown \quad \diagup \\ \text{C} = \text{C} \\ \diagup \quad \diagdown \\ \text{R} \quad \quad \text{R} \end{array} \xrightarrow[\text{H}_2]{\text{Ni / Pd}} \begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{R}-\text{C}-\text{C}-\text{R} \\ \quad \\ \text{R} \quad \text{R} \end{array}$	1	

	iii) $\text{CH}_4 + \text{Cl}_2 \xrightarrow{\text{Sunlight}} \text{CH}_3\text{Cl} + \text{HCl}$	1	
	(or any other chemical equation)		
	b) • An alcohol having two carbon atoms in its molecule / $\text{C}_2\text{H}_5\text{OH}$	1	
	• Ethene is formed	$\frac{1}{2}$	
	• Dehydrating agent	$\frac{1}{2}$	5
Q20.	(a) Sustainable development: Development which meets the current basic human needs, while preserving the resources for the needs of future generation.	1	
	It is necessary for environmental conservation.	1	
	(b) Water harvesting – It is a method to capture every trickle of water that falls on the land.	1	
	Four benefits –		
	(i) Recharges wells/ Ground water		
	(ii) Provides moisture for vegetation		
	(iii) It is not lost by evaporation		
	(iv) It does not provide a breeding place for mosquitoes		
	(v) Prevents ground water from contamination due to human and animal wastes.		
	(any four)	$\frac{1}{2} \times 4$	5
Q21.	(a) (i)		
		2	
	(ii)		
		2	
	(b) Image formed is virtual, erect and diminished in both cases.	1	5
Q22.	• Hypermetropia / Longsightedness	1	
	• Defective eye	1	

			
	<ul style="list-style-type: none"> Two causes: <ol style="list-style-type: none"> the focal length of the eye lens is too long the eyeball has become too small. 	1	
	<ul style="list-style-type: none"> Correction of the defect using appropriate lens 	1	5
Q23.	(i) <ul style="list-style-type: none"> In of the Mendel's experiments when (Pure) tall pea plants were crossed with (Pure) dwarf pea plants, only tall pea plants were obtained in the F₁ generation. 	1	
	<ul style="list-style-type: none"> On selfing the F₁ generation pea plants, both tall and dwarf plants were obtained in F₂ generation. 	½	
	<ul style="list-style-type: none"> Appearance of tall character in F₁ and F₂ generation shows that the tallness is the dominant character and dwarfness which could not appear in F₁ but appeared in F₂, is a recessive character. 	1	
	(ii) <ul style="list-style-type: none"> When Mendel crossed tall pea plants with round seeds and a dwarf pea plant with wrinkled seeds, the F₁ progeny plants were all tall with round seeds. 	1	
	<ul style="list-style-type: none"> On self-pollination of F₁ plants the F₂ progeny consisted of both parental characters (tall plants with round seeds and dwarf plants with wrinkled seeds) as well as new combinations like tall plants with wrinkled seeds and dwarf plants with round seeds. 	1	
	<ul style="list-style-type: none"> Thus, it may be concluded that tall and dwarf traits and round and wrinkled have been inherited independently OR A flow chart depicting the same	½	5
	Note: Any other contrasting characters may be taken.		
Q24.	(a) Pollination – Process of transfer of pollen grains from the anther to the stigma of the flower	1	
	Two types – Self-pollination and Cross pollination	½, ½	

	<p>(b)</p>  <p>Stigma</p> <p>Pollen tube with Male germ-cell</p> <p>Female germ-cell</p> <p style="text-align: right;">Diagram Three labellings</p>	<p>1 ½ ½ x 3</p>	<p>5</p>
SECTION – B			
25) A	26) C	27) B	
28) C	29) C	30) C	
31) A	32) Give full credit to all answers	33) C	<p>1 × 9 9</p>
Q34.	A colourless gas with brisk effervescence is evolved.		1
	Lime water turns milky when this gas is passed through it.		1 2
Q35.	 <p>Cotyledon</p> <p>Plumule</p> <p>Radicle</p> <p style="text-align: right;">Diagram Three labellings</p>		<p>½ ½ x 3</p>
Q36.	On adding soap solution lather will be formed in the beaker containing soft water only.		1
	On adding detergent solution lather will be formed by both hard and soft water / in both the beakers.		1 2