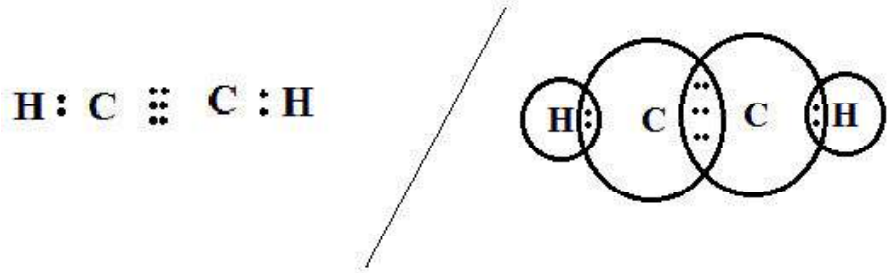
CBSE Class 10 Science Solution PDF

SUMMATIVE ASSESSMENT - II **Code No. 31/1**

MARKING SCHEME - SCIENCE (DELHI)

SECTION - A

31/1	Expected Answer / Value point	Marks	Total
Q1.	Seven	1	1
Q2.	Reproduction	1	1
Q3.	1000 J	1	1
Q4.	i) Here $n_w = \frac{4}{3}$; $n_g = \frac{3}{2}$; $v_g = 2\times10^8$ m/s $n_g = \frac{c}{v_g}$ $\therefore\ c = n_g v_g = \frac{3}{2}\times 2\times10^8$ m/s $= 3\times10^8$ m/s ii) $n_w = \frac{c}{v_w}$ $\therefore\ v_w = \frac{c}{n_w} = \frac{3\times3\times10^8}{4} = 2.25\times10^8$ m/s	½ ½ 1	2
Q5.	Causes: Disposal of industrial effluents Human activities like bathing, washing, immersion of ashes, etc. Disposal of untreated sewage (any two) Harmful effects on health – Spreads water borne diseases, - Consumptions of contaminated fishes (or any other relevant affect)	½, ½ ½,½	2
Q6.	Biodiversity - Number and range of variety of species of life forms in an area. Effect – Loss of diversity may lead to a loss of ecological stability.	1 1	2

31/1	Expected Answer / Value point	Marks	Total
Q7.	• Test 1 (Litmus Test)	½	
	Take two strips of blue litmus paper. Place a drop each of the alcohol and carboxylic acid on these strips separately. The blue litmus paper turns red in the case of carboxylic acid and remains unaffected in the case of alcohol.	1	
	• Test 2 (Sodium hydrogen carbonate test / sodium carbonate test)	½	
	A pinch of sodium hydrogen carbonate or sodium carbonate is added to both separately. If brisk effervescence with the evolution of a colorless gas is observed, it indicates the presence of carboxylic acid.		
	If no change is observed, then it confirms the presence of alcohol.	1	
	• Test 3 – Ester test or any other suitable test (any two)	3	
Q8.		1	
	In pure oxygen, ethyne undergoes complete combustion and hence high temperature, suitable for welding, is attained.		1
	Whereas air contains less percentage /amount of oxygen which results in incomplete combustion of ethyne and the temperature required for welding is not attained.	1	3

31/1	Expected Answer / Value point			Marks	Total
Q9.	**Property**	**P**	**Q**		
	(a) No. of electrons in the atom	3	4		
		11	12		
		19	20		
			(any one pair)	½	
	(b) Size of the atom	Bigger	Smaller	½	
	(c) Metallic character	More metallic	Less metallic	½	
	(d) Tendency to lose electrons	More	Less	½	
	(e) Formula of oxides	P_2O	QO	½	
	(f) Formula of chlorides	PCl	QCl_2	½	3
	Note: For parts (e) and (f) examples using symbols of elements may also be accepted.				
Q10.	• Electronic configuration of element with atomic number 16 is 2,8,6.			1	
	• Since it has 3 shells, the period number will be 3.			½	
	• Since the no. of valence electrons is 6, the group number will be 10 + 6 = 16.			½	
	• Valency of the element will be 8 – valence electrons, i.e., 8 – 6 = 2.			1	3
Q11.	Characteristics:				
	• Two parents are involved,				
	• Two dissimilar gametes are formed, gamete formation involves meiosis,				
	• Variations are produced,				
	• Occurs in all the higher and some of the lower organisms,				
	• Fertilization / fusion of gametes leading to zygote formation				
	• Slow.			½×6	3

31/1	Expected Answer / Value point	Marks	Total
Q12.	Chromosomes – Thread like structures made up of DNA found in the nucleus. The original number of chromosomes becomes half during gamete formation. Hence, when the gametes combine, the original number of chromosomes gets restored in the progeny. (or same thing explained in the form of a flow chart).	1,1	1 3
Q13.	**Significance of reproductive health :** Prevent STDs, Advantage of small family, Less mortality among new borns, Reduces the cases of maternal mortality. **Areas which have improved over the past 50 years** – Family Planning, – Decrease in STD cases (any other)	½×4 ½×2	3
Q14.	**Homologous organs** – Study of homologous organs suggests that the organs having same structure but performing different functions have evolved from a common ancestor. Example - Forelimbs of a frog, lizard, bird and man. **Analogous organs** – show adoption of organs for common use. Example – Wings of butterfly and wings of bat. **Fossils** – provide the missing links between two species. Example – Archeopteryx / fossils of some dinosaurs with feathers.	½ ½ ½ ½ ½ ½	3
Q15.	(a) Speciation • Evolution of a new species from pre-existing species • Occurring due to accumulation of variations • By processes like genetic drift / geographical barriers like mountains, rivers etc., leading to incapability to reproduce amongst themselves in the population.	½×3	

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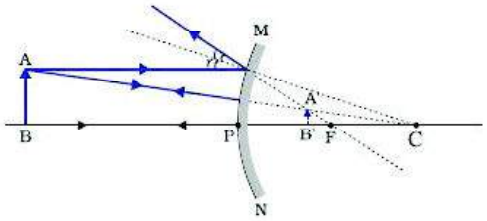
	(b) Natural selection • Change in frequency of some genes in a population • Which give survival advantage to a species from elimination. • Example – In a population of beetles, a new variation (green colour) get survival benefit / advantage to green beetles whereas other (red) perishes.	½×3	3
Q16.	Convex mirror	½	
		1	
	Use: As rear view mirror in vehicles/ Also in Malls, Hotels, Airports for security reasons.	½	
	Why: • Forms erect image,	½	
	• Wider field of view.	½	3
Q17.	(i) Scattering – Phenomenon of spreading of light (diffused reflected light) caused by minute particles (dust, smoke etc.) in the atmosphere.	1	
	(ii) Sky appears blue because blue color of sunlight scatters more strongly (due to shorter wavelength) than the red color by the fine particles in the atmusphere. **OR** At sunrise the blue color of sunlight get scattered due to smaller wavelength while passing through the thicker layers of the atmosphere. The red component (due to longer wavelength) reaches us, giving red appearance, of the Sun.	2	3
	Note: If explained by following diagram (fully labeled) give full credit.		

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	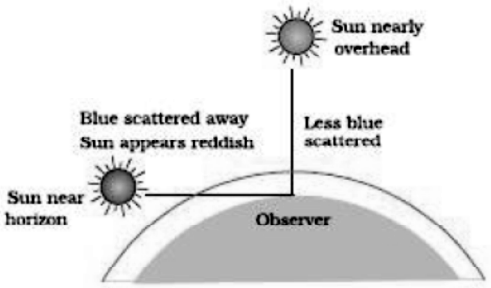		
Q18.	Biodegradable substances – can be broken down into simpler substances by nature / decomposers/ bacteria/ saprophytes/ saprobionts.	½	
	Example – Human Excreta/ Vegetable peels, etc. (any one)	½	
	Non-biodegradable substances – can't be broken down into simpler substances by nature / decomposers.	½	
	Example – Plastic/ glass (or any other) (any one)	½	
	Habits people must adopt : - Use of separate dustbins for biodegradable and non biodegradable waste, - Reuse of things such as poly-bags, etc., - Recycle of waste, - Use of cotton /jute bags for carrying vegetables etc. (any two)	½×2	3
Q19.	• Soaps are sodium or potassium salts of long chain carboxylic acids.	½	
	• Detergents are ammonium or sulphonate salts.	½	
	• Cleansing action of soap – One part of soap molecule is ionic / hydrophilic and dissolves in water. The other part is non-ionic / carbon chain / hydrophobic part which dissolves in oil.	1	

31/1	Expected Answer / Value point	Marks	Total
	• Thus soap molecules arrange themselves in the form of a micelle/diagram of a micelle.	½	
	On rinsing with water, soap is washed off, lifting the oily dirt particles with it.	½	
	Soap does not form lather in hard water, because of the reaction of soap with Ca and Mg ions present in hard water, and forms insoluble precipitate / scum.	1	
	Problems due to the use of detergents are:		
	• Detergents are non-biodegradable.		
	• It leads to water or soil pollution.		
	• It can also cause skin problems. **(any two)**	½×2	5
Q20.	a) Testis – secrete male hormone – testosterone	1	
	Functions – i) Formation of sperms,		
	ii) Development of secondary sexual characters.	½×2	
	b) i) Fallopian tube / /oviduct.		
	ii) Uterus.	½×2	
	• Placenta is a special disc like tissue embedded in the mother's uterine wall and connected to the foetus / embryo.	1	
	• Placenta provides a large surface area for glucose and oxygen/nutrients to pass from the mother's blood to the embryo/ foetus.	1	5
Q21.	a) When Mendel cross pollinated pure tall pea plants with pure dwarf pea plants, only tall plants were obtained in F1 generation. On self pollinating the F1 progeny, both tall and dwarf plants appeared in F2 generation in the ratio 3:1	1	
	Appearance of tall character in both the F1 and F2 progenies shows that tallness is a dominant character. The absence of dwarf character in F1 generation and its reappearance in F2 shows dwarfness is the recessive character.	1	

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	b) When Mendel conducted a dihybrid cross having two sets of characters, he obtained only one set of parental characters in F1 generation whereas in F2 generation he obtained both the set of parental characters now recombined in the ratio of 9:3:3:1.	1	
	The appearance of new recombinants in the F2 generation along with parental type shows that traits are inherited independently.	1	5
	Or		
	Flow chart with explanation.		
Q22.	• Power of lens:- Ability of a lens to converge or diverge the light rays falling on it / The degree of convergence or divergence of light rays achieved by a lens / Reciprocal of focal length of the lens.	1	
	• 1 dioptre – It is the power of a lens whose focal length is 1 metre.	½	
	• $f_A = +10 \text{ cm} = 0.1\text{m}$		
	Converging/ Convex lens	½	
	$P_A = \frac{1}{f_A} = \frac{1}{+0.1\text{m}} = +10\text{D}$	½	
	$f_B = -10 \text{ cm} = -0.1\text{m}$		
	Diverging/ Concave lens	½	
	$P_B = \frac{1}{f_B} = \frac{1}{-0.1\text{m}} = -10\text{D}$	½	
	• In this case the object distance is 8 cm which is less than the focal length, the object will be in between the optical centre and principal focus of the lens. Hence, the convex lens, i.e., lens A will form virtual and magnified image of the object.	½	

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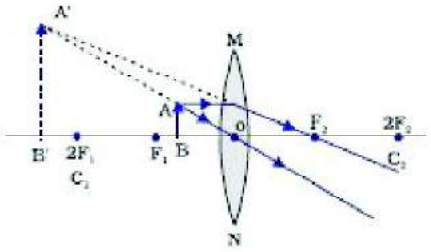
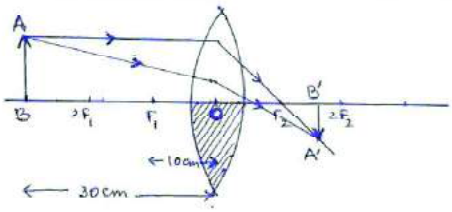
	• 	1	5
Q23.	• Yes	½	
	• 		
	(Note: Image must be between F_2 and $2F_2$)	1½	
	• $h = 4$ cm $f = +20$ cm $u = -15$ cm $v = ?$ $h' = ?$		
	$\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$	½	
	$\therefore \frac{1}{v} = \frac{1}{f} + \frac{1}{u} = \frac{1}{(+20)} + \frac{1}{(-15)} = \frac{3-4}{60} = \frac{-1}{60}$		
	$\therefore v = -60$ cm	1	
	Nature – Virtual, erect	½	
	$h' = \frac{v}{u} \times h = \frac{-60\,\text{cm}}{-15\,\text{cm}} \times (+4\,\text{cm}) = +16\,\text{cm}$	1	5
	Note: Problem can be solved through ray diagram also.		
Q24.	• Ciliary muscles modify the curvature of the eye lens to enable the eye to focus objects at varying distances/ help in adjusting the focal length of the eye lens	1	
	• Presbyopia	½	
	• Bifocal lens	½	

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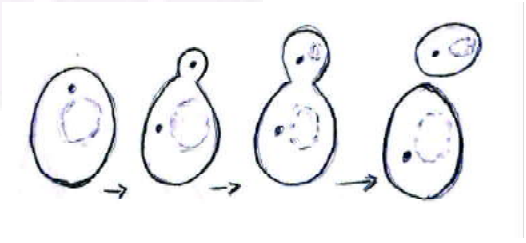
	(a) Defect – Myopia/ Nearsightedness	½	
	Corrective lens – Concave/ Diverging lens	½	
	(b) Values – Concerned, Caring etc. (one value of teacher, one value of Salman)	½,½	
	(c) By thanking the teacher and Salman	1	5
	SECTION – B		
	25) A 26) D 27) A		
	28) C 29) B 30) B		
	31) D 32) D 33) B	1×9	9
Q34.	• Carbon dioxide / CO_2.	1	
	• Lime Water turns milky when CO_2 is passed through it./CO_2 extinguishes a burning splinter.	1	2
Q35.	Fine adjustment screw	1	
		1	2
Q36.	• Towards the lens	1	
	• Magnification decreases	1	2