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

Marking Scheme – Science (Vocational) 531/1

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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.

3. If a question has parts, please award marks in the right hand side for each part. Marks awarded for different parts of the question should then be totalled up and written in the left hand margin.

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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.

6. Wherever only two/three of a 'given' number of examples/factors/points are expected only the first two/three or expected number should be read. The rest are irrelevant and should not be examined.

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 in the incorrect answer and awarded ‘0’ marks.

9. ½ 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.

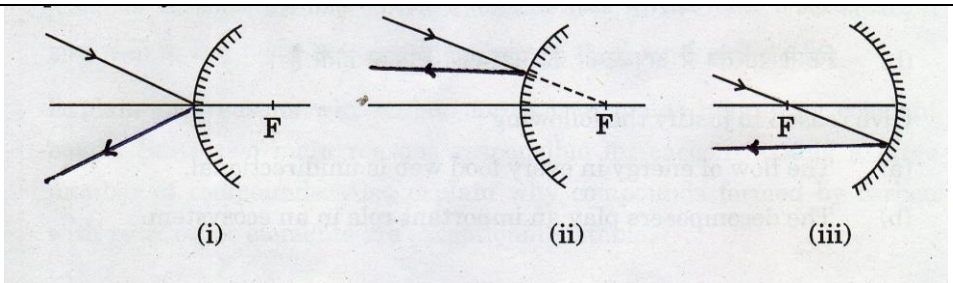
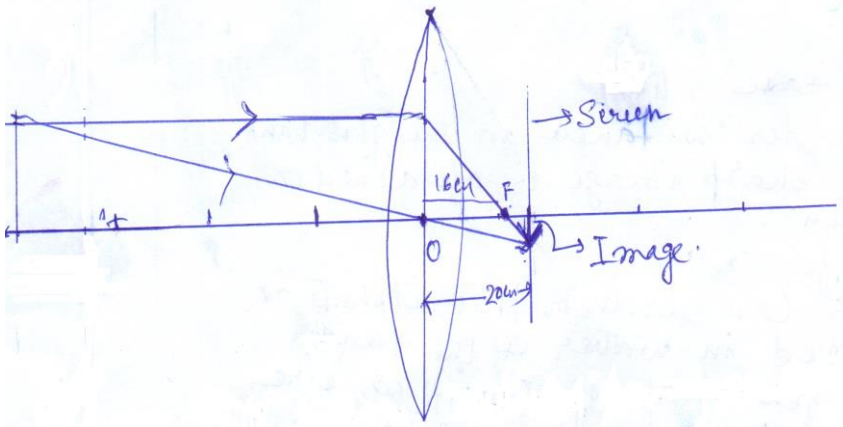
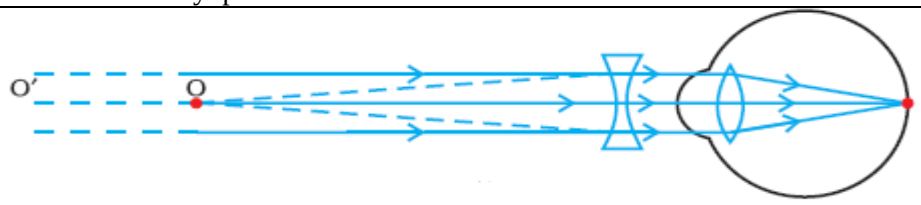
11. As per orders of the Hon’ble Supreme Court the candidates would now be permitted to obtain photocopy of the Answer Book on request on payment of the prescribed fee. All Examiners/Head Examiners are once again reminded that they must ensure that evaluation is carried out strictly as per value points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

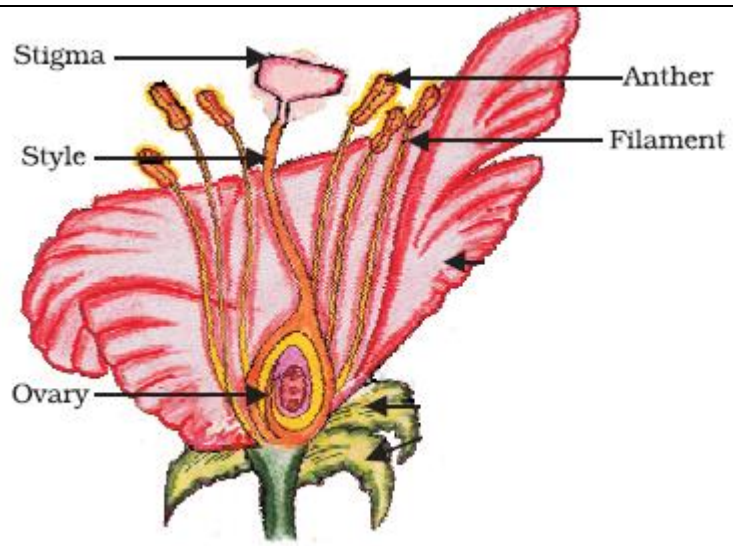
MARKING SCHEME **Code No. 531/1**

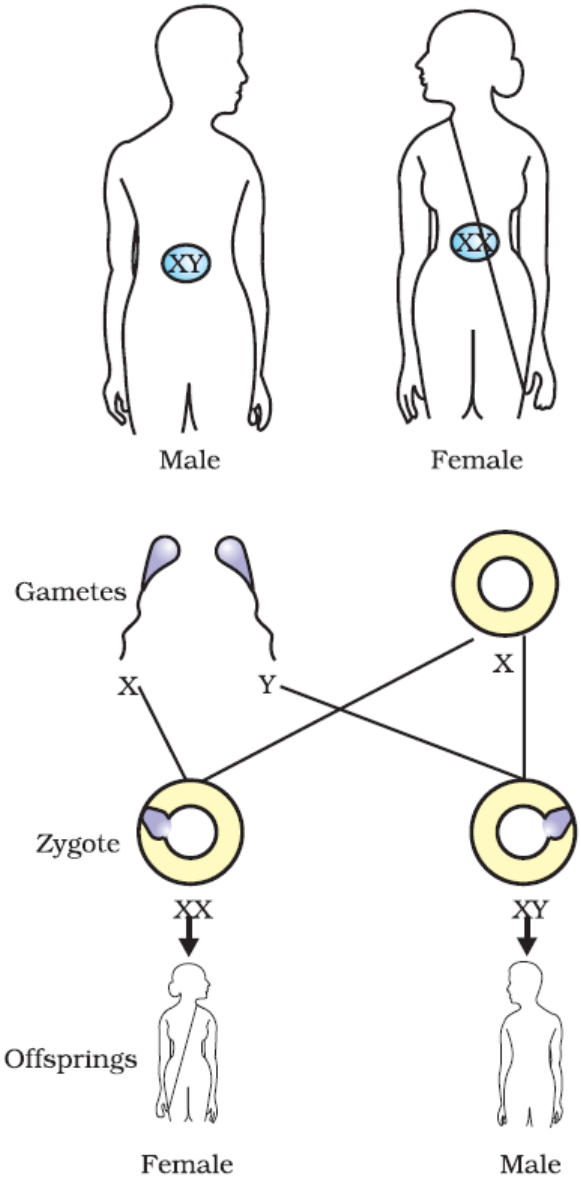
CLASS X – VOCATIONAL

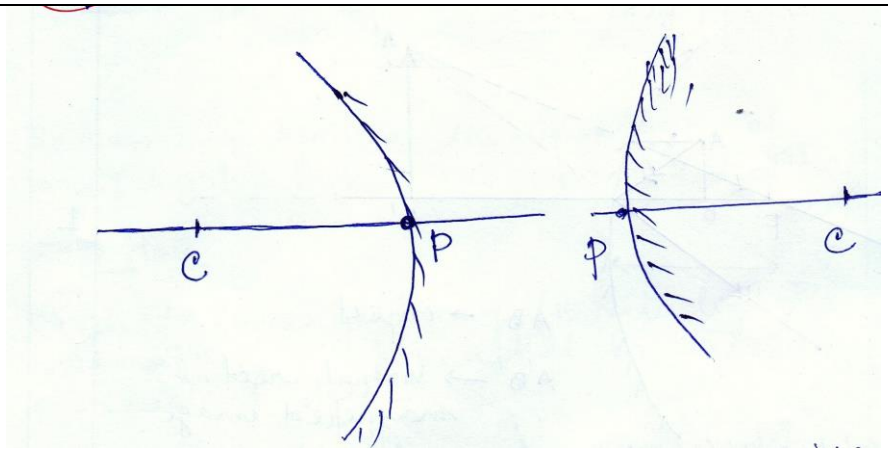
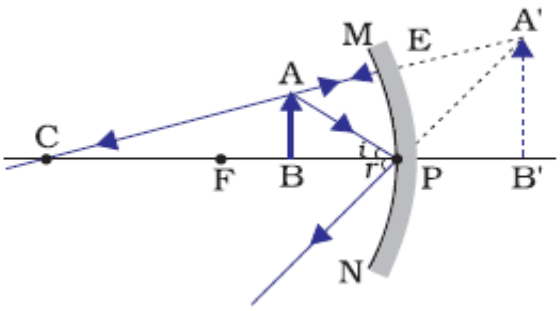
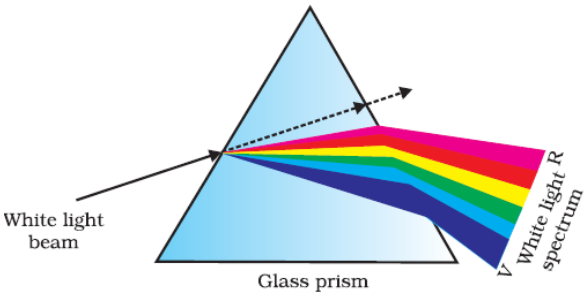
	Expected Answer/ Value point	Marks	Total
	SECTION – A		
Q1.	CH_3OH / C_2H_5OH Methanol / Ethanol	½ ½	1
	(or any other)		
Q2.	Hydrocarbons having single bonds only [between C & C]	½	
	CH_4 / C_2H_6 / C_3H_8 (or any other)	½	1
Q3.	Unisexual → Papaya / watermelon	½	
	Bisexual → Hibiscus / Mustard (or any other)	½	1
Q4.	• Process in which parts of plants like roots, stems and leaves develop into new plants.	1	
	• Sugarcane / Roses / Grapes / Jasmine / Banana / Orange (any two)	½ + ½	2
	(Any other relevant example.)		
Q5.	• Relation:		
	Absolute Refractive Index $\mu = \frac{\text{Speed of light in vacuum}}{\text{Speed of light in the medium}}$	1	
	Or $\mu = \frac{c}{v}$		
	• $\mu = \frac{3\times10^8 \text{ m/s}}{1.4\times10^8 \text{ m/s}}$	½	
	= 2.14	½	2
Q6.	• Coal and petroleum are considered as fossil fuels because they are formed from the remains of the ancient life (Plants and animals) buried deep in the earth's crust.	1	
	• They take millions of years in their formation/ their formation process takes millions of years.	½	
	• CO_2 / SO_2 / NO_2 (any one)	½	2
Q7.	• Because of addition of oxygen or removal of hydrogen.	½	
	• Ethanol when burnt in O_2, produces CO_2 and H_2O with the evolution of heat and light.	½	
	$C_2H_5OH \xrightarrow[\text{OR acidified } K_2Cr_2O_7+\text{Heat}]{\text{Alkaline } KMnO_4+\text{Heat}} CH_3COOH$	1	
	$C_2H_5OH + O_2 \longrightarrow CO_2 + H_2O + \text{Heat \& Light}$	1	3

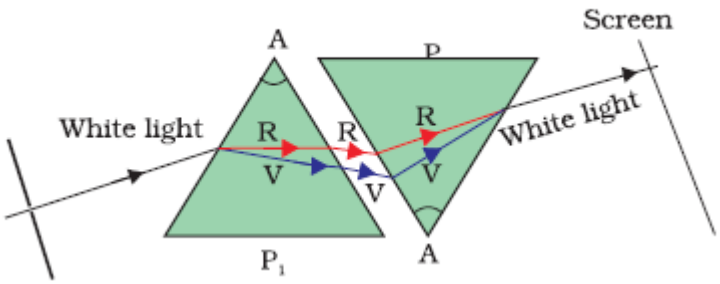
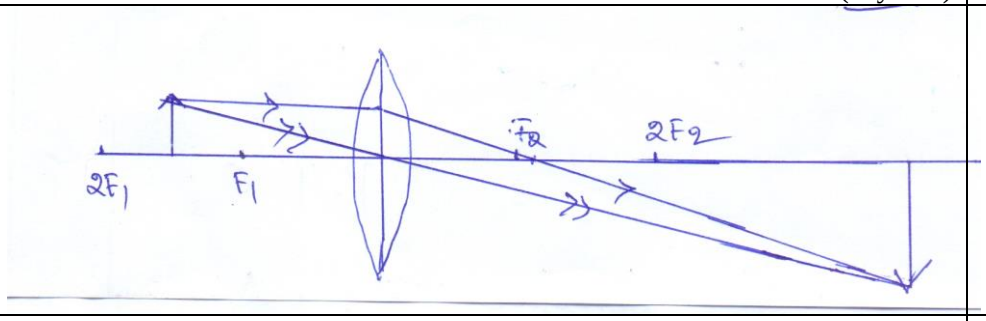
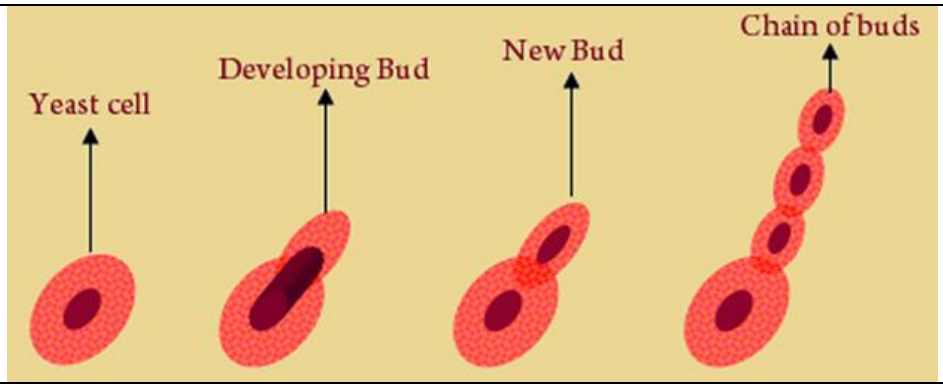
Q8.	a) K (19)		½	
	2, 8, 8, 1 Electronic Configuration)		½	
	b) Be (4), Ca (20)		½	
	[2, 2 ; 2, 8, 8, 2]			
	Both have two valence electrons		½	
	c) Be (4), O (8) → Same period			
	2, 2 2, 6 (Second Period)			
	OR			
	K (19), Ca (20) 2, 8, 8, 1 2, 8, 8, 2 > Belong to 4th period		½ + ½	3
Q9.	Difference			
	Pollination	**Fertilization**		
	Transfer of pollen grains from anther to stigma	Fusion of male and female gametes	1	
	Note: Marks be awarded if the corresponding differences are mentioned.			
	• Cross–pollination – Transfer of pollen grains from anther of one flower to the stigma of another flower of a different plant (of the same species)		1	
	• Wind, water, animals (any two)		½ + ½	3
Q10.	Four methods of Contraception –			
	i) Mechanical or Barrier / Condoms		½	
	ii) Oral Pills		½	
	iii) Copper-T		½	
	iv) Surgical Methods/ Vasectomy/ Tubectomy		½	
	• Health of women is maintained and parents can give more attention to their children.		½	
	• More resources may be made available for the improvement of living standard thereby nation becomes prosperous.		½	3
Q11.	Description of Mendel's experiment			
	• Mendel in his experiment selected garden pea plant with contrasting character such as tall and dwarf and crossed them and raised F_1 generation.			
	• He observed that only one of the two contrasting characters appeared in the F_1 generation and the other did not appear.			
	• In order to find out about the character which did not appear in F_1 generation, if it was inherited or not, he raised F_2 generation by selfing the plant of F_1 generation.			
	• This time he observed that the character which did not appear in F_1 generation, showed its appearance in some plants of F_2 generation.			
	• He thus interpreted that out of each pair of contrasting characters one was dominant and the other was recessive.			
	• The dominant appeared in F_1 generation and the recessive appeared in some plants of the F_2 generation.		½ x 6	3
Q12.	**Acquired Traits**	**Inherited Traits**		
	• Does not bring change in the DNA of germ cells	• Brings about change in DNA of germ cell	1	
	• Cannot to be passed on to the progeny	• Can be passed on to the progeny	1	
	• Cannot direct evolution	• Can direct evolution	1	3

Q13.		1, 1, 1	3
Q14.	a) Convex lens as real images can only be formed by convex lens.	1	
	b) For Convex lens, given		
	$u = -80$ cm ; $v = +20$ cm		
	i) Distance between the object and the image is = (80 + 20) cm = 100 cm.	½	
	ii) Magnification $m = \frac{v}{u} = \frac{20\text{cm}}{-80\text{cm}} = -\frac{1}{4}$	½	
	c) 	1	3
Q15.	Inability of an eye to see the distant objects clearly.	½	
	Two causes:		
	i) Excessive curvature of the eye lens	½	
	ii) Elongation of the eye ball.	½	
	Correction for myopia		
		1 ½	3
Q16.	• Brief Description of the apparatus/ procedure	1 ½	
	• Observation	½	
	• Conclusion	1	3
Q17.	a) In a food chain the energy moves progressively through the various trophic levels and is no longer available to the organisms of previous level/ energy captured by the autotrophs does not revert back to the solar input; because	1 ½	

	only 10% of energy is transferred to the next level and the rest of it is either utilized or lost to the environment.		
	b) Decomposers (Microorganisms – Bacteria/ Fungi) break down the dead remains and waste products (Complex organic substances) into simpler organic substances, that go into the soil. Hence, their role is very important.	1 ½	3
Q18.	• Saves energy that is wasted in segregation, Disposal becomes quick.	½ + ½	
	• Two arguments		
	i) Clean environment essential for good health, saves from mosquito etc., Foul smell.	½	
	ii) Garbage may cause diseases	½	
	• Sincerity, seeks co-operation, helpful, concern about environment (any two)	½ + ½	3
Q19.	• Carbon has <u>four</u> electrons in its outermost sheet, it cannot form either <u>C^{4+}</u> cations or <u>C^{4-} anions</u>, due to large amount of <u>energy</u> involved, so sharing of electrons takes place and carbon forms only compounds with covalent bond.	½ x 4	
	Reasons:		
	• Catenation	1	
	• Tetravalency of carbon	1	
	• Due to the small size of carbon atom, its nucleus is able to hold on to the shared pair of electrons strongly.	1	5
Q20.	a) • In the modern periodic table 18 groups and 7 periods.	1	
	• Atomic size increases down the group due to the addition of one shell successively.	1	
	b) A (2, 8, 7); B – (2, 8, 1); C – (2, 8, 2); D – (2, 8, 8, 2)		
	i) A will form acidic oxide because only one electron is required to attain noble gas configuration/ because it is a nonmetal.	½ + ½	
	ii) A will have smallest atomic radius because it is an element of 3rd period and 17th group.	½ + ½	
	iii) A and B – Monovalent	1	5
Q21.			
	• Diagram	½	
	• Any three correct labelling	3 x ½	
	• Female reproductive organs –		

	Identification and function –		
	Ovary – produces egg cell	½, ½	
	Stigma – receives pollen grains	½, ½	
	Style – tube grows out of the pollen grains and travels through the style to reach ovary/ transports male germ cells to ovary	½, ½	5
Q22.	23 pairs/ 22 pairs + 1 pair of sex chromosomes	½	
	One pair / 2 chromosomes	½	
	Two types/ X and Y	½	
	 Conclusion: Thus it is a matter of chance that 'X' carrying egg is fertilized by an 'X' carrying sperm resulting in a female or by a 'Y' carrying sperm resulting in a male child.	½ ½ + ½ ½ + ½ 1	5

Q23.	a)  Concave Mirror Convex Mirror	½ + ½	
	• For marking P and C	½	
	i) Pole (P) – The centre of the reflecting surface of a spherical mirror	½	
	ii) Centre of curvature (C) – The centre of the sphere of which the spherical mirror is a part.	½	
	iii) Principal axis (PC) – An imaginary line passing through the pole and the centre of curvature of the spherical mirror.	½	
	b) i) Concave mirror	½	
	ii) ∵ f = – 15 cm = focal length		
	∴ Range of Object distance < 15 cm	½	
	iii) 	1	5
	Note: ½ mark be deducted if arrow is not shown.		
Q24.			
	Note:		
	• White light	½	
	• Direction of rays	½	
	• Splitting of white light into seven colours at the point of incidence	½	
	• V I B G Y O R (order of colours should be shown correctly)	½	

				1	
	Note:				
	• Final emergent ray (white light) should be parallel to the incident ray.			1	
	• Dispersion (R – V) in the first prism and recombination in the second prism should be shown.			1	5
	SECTION – B				
	25) B	26) C	27) D		
	28) A	29) A	30) D		
	31) C	32) A	33) B	1 X 9	9
Q34.	Wrong marking of F_2 and $2F_2$				
	∵ Object between F_1 and $2F_1$				
	∴ Image should be beyond $2F_2$ and image should be magnified.			½ + ½	
	(any two)				
				1	2
Q35.	A. Clear solution is obtained				
	B. No change in colour				
	C. Blue litmus solution turns red.				
	D. Red solution.			½ x 4	2
Q36.				4 x ½	2

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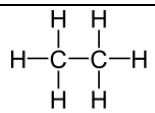
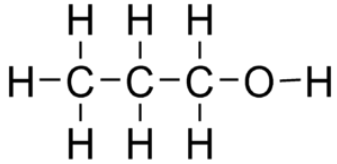
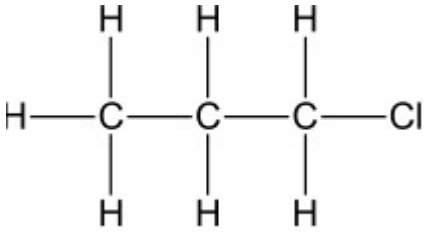
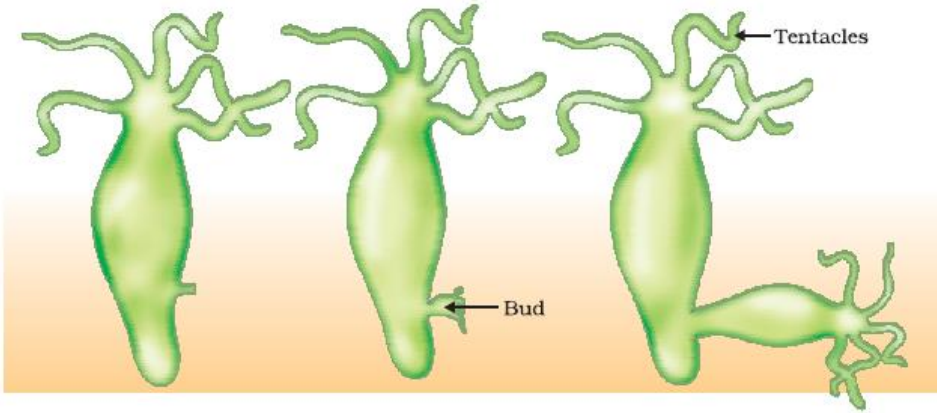
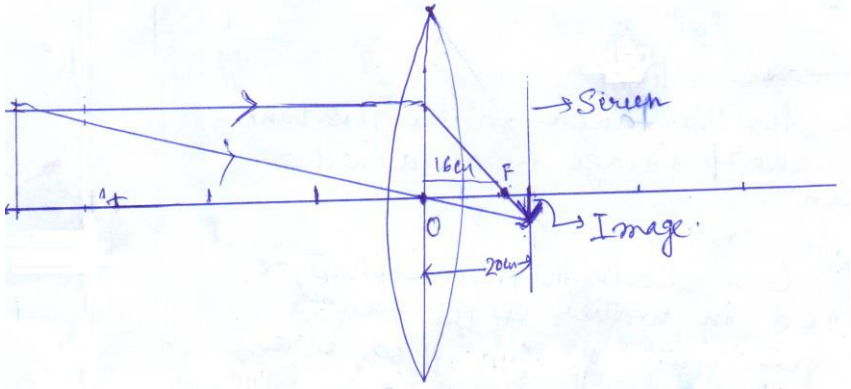
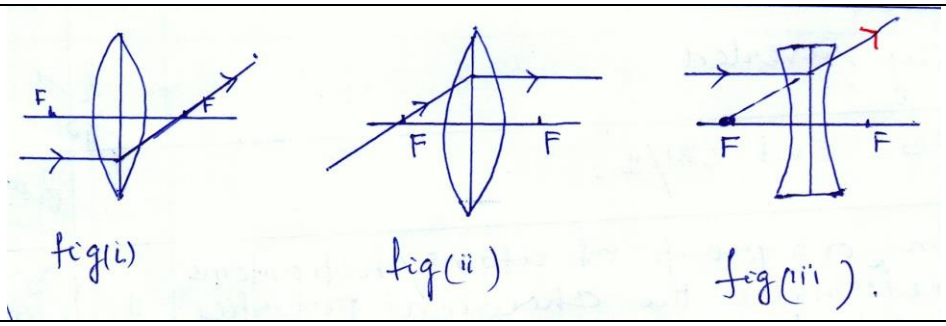
MARKING SCHEME **Code No. 531/2**

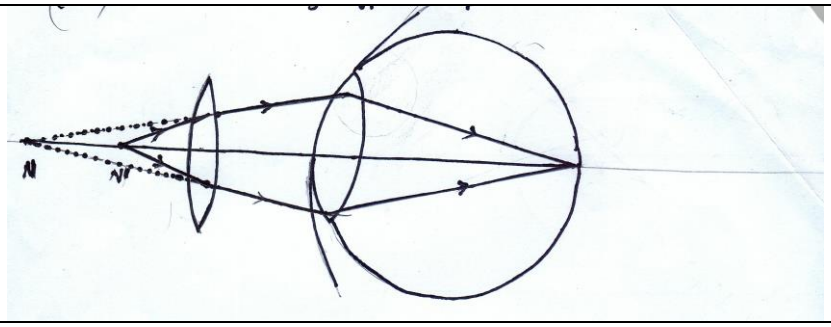
CLASS X – VOCATIONAL

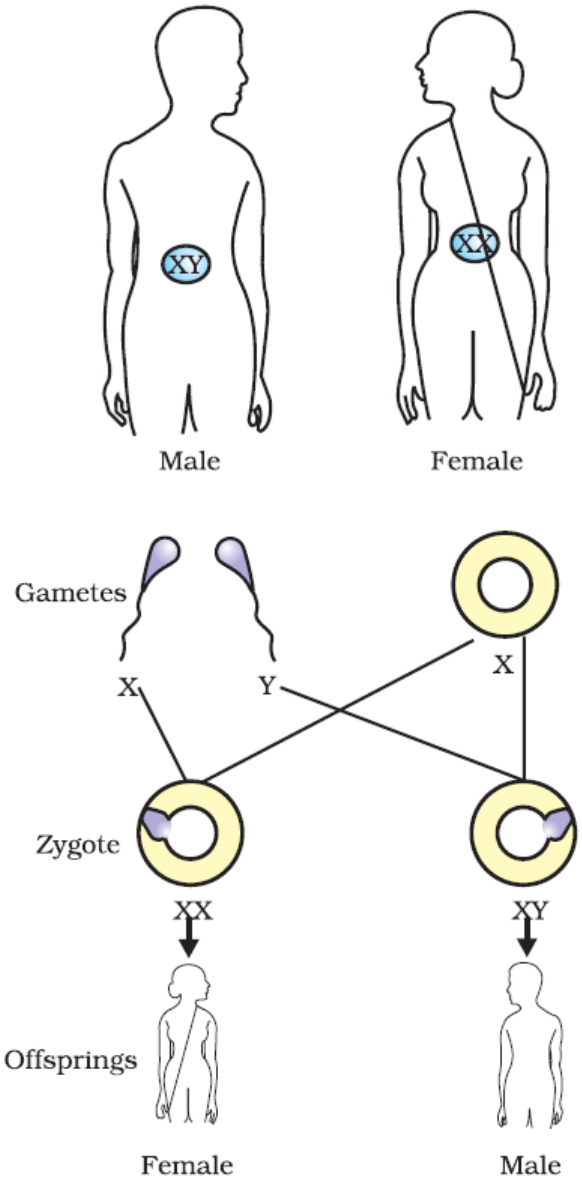
	Expected Answer/ Value point		Marks	Total
	SECTION – A			
Q1.	 ; Seven		½ , ½	1
Q2.	Oxidation reaction		1	1
Q3.	Reproduction		1	1
Q4.	Binary Fission	Fragmentation		
	• Nuclear division takes place first	• The organism breaks into two or more pieces upon maturation	1	
	• Constriction occurs in the cytoplasm to produce the daughter cells each developing into an adult	• Each piece grows into an individual.	1	2
Q5.	Four characteristics of the image formed by convex mirrors- • Virtual • Erect • Diminished • Behind the mirror		½ x 4	2
Q6.	• Coal and petroleum are considered as fossil fuels because they are formed from the remains of the ancient life (Plants and animals) buried deep in the earth's crust.		1	
	• They take millions of years in their formation/ their formation process takes millions of years.		½	
	• CO_2 / SO_2 / NO_2 (any one)		½	2
Q7.	• An atom or a group of atoms/ hetroatoms which determine the chemical properties of an organic compound. • Propanol-  ; Alcohol		1 ½ , ½	

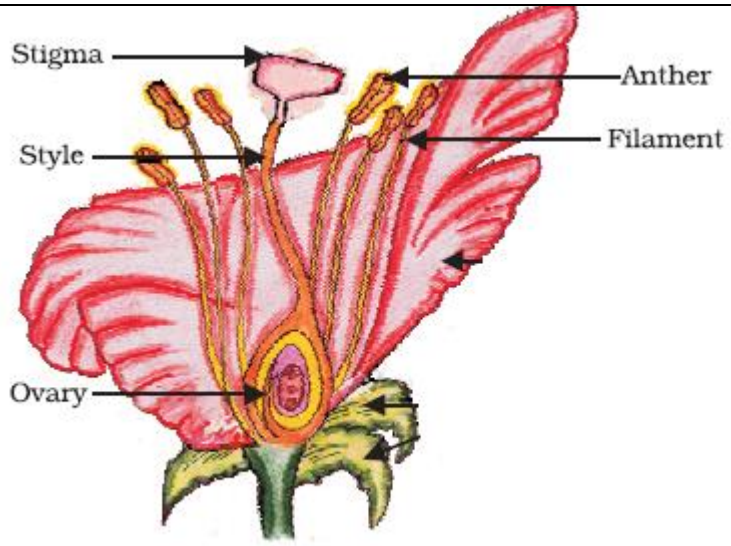
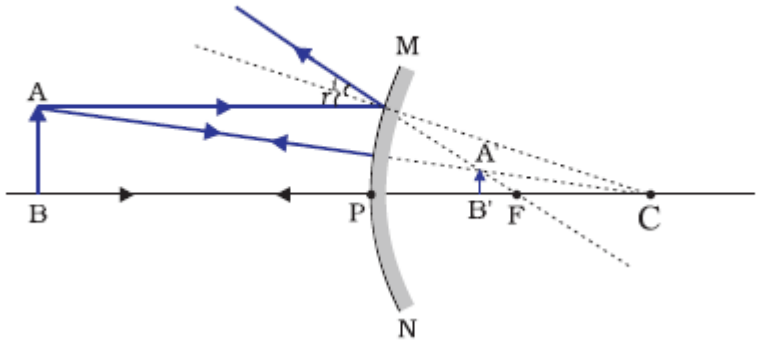
	 ; chloro	½ , ½	3
Q8.	X(8)→2, 6 Y(17)→ 2, 8, 7 Z(20)→ 2, 8, 8, 2	½ x 3	
	a) Z- Fourth period b) Y- Group 17 c) ZX	½ ½ ½	3
Q9.	 Diagram Labelling • Since two parents – One male and female are not involved in the process of reproduction/ does not involve fusion of gametes.	1 ½ 1 ½	3
Q10.	Four methods of Contraception –		
	i) Mechanical or Barrier / Condoms	½	
	ii) Oral Pills	½	
	iii) Copper-T	½	
	iv) Surgical Methods/ Vasectomy/ Tubectomy	½	
	• Health of women is maintained and parents can give more attention to their children.	½	
	• More resources may be made available for the improvement of living standard thereby nation becomes prosperous.	½	3

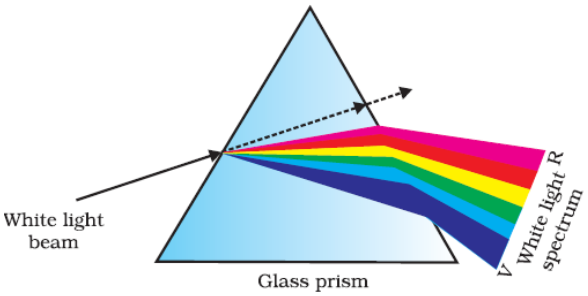
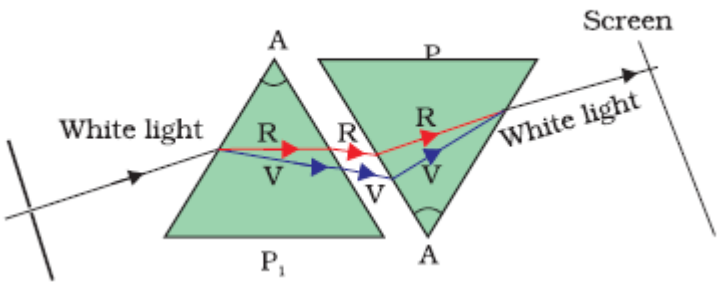
Q11.	**Acquired Traits**	**Inherited Traits**		
	• Does not bring change in the DNA of germ cells	• Brings about change in DNA of germ cell	1	
	• Cannot to be passed on to the progeny	• Can be passed on to the progeny	1	
	• Cannot direct evolution	• Can direct evolution	1	3

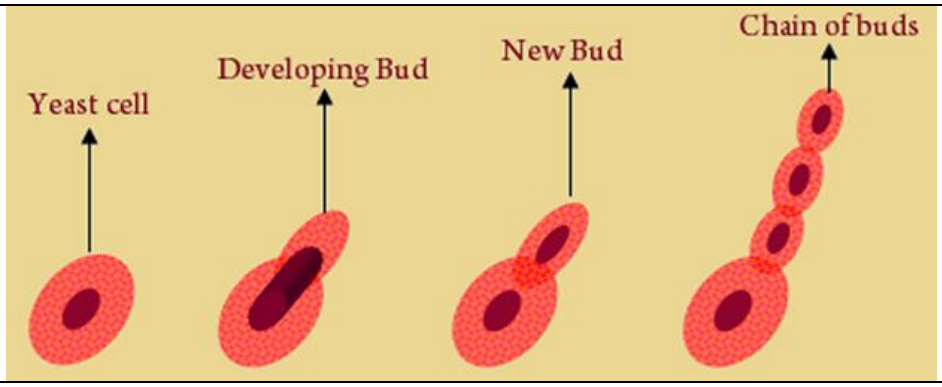
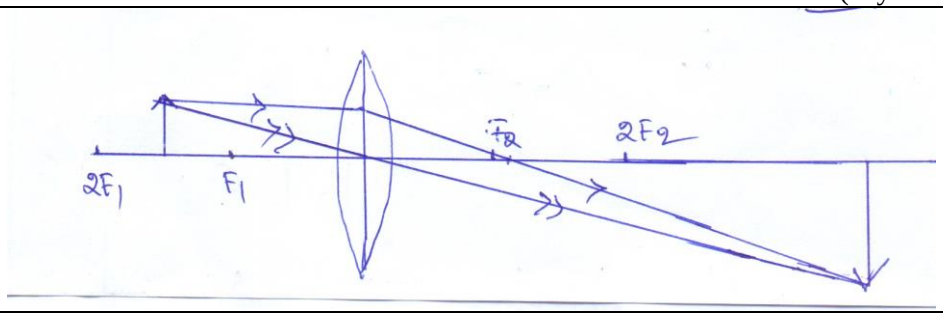
Q12.	Description of Mendel's experiment		
	• Mendel in his experiment selected garden pea plant with contrasting character such as tall and dwarf and crossed them and raised F_1 generation.		
	• He observed that only one of the two contrasting characters appeared in the F_1 generation and the other did not appear.		
	• In order to find out about the character which did not appear in F_1 generation, if it was inherited or not, he raised F_2 generation by selfing the plant of F_1 generation.		
	• This time he observed that the character which did not appear in F_1 generation, showed its appearance in some plants of F_2 generation.		
	• He thus interpreted that out of each pair of contrasting characters one was dominant and the other was recessive.		
	• The dominant appeared in F_1 generation and the recessive appeared in some plants of the F_2 generation.	½ x 6	3
Q13.	a) Convex lens as real images can only be formed by convex lens.	1	
	b) For Convex lens, given		
	$u = -80\ \text{cm}$; $v = +20\ \text{cm}$		
	i) Distance between the object and the image is = (80 + 20) cm = 100 cm.	½	
	ii) Magnification $m = \frac{v}{u} = \frac{20\text{cm}}{-80\text{cm}} = -\frac{1}{4}$	½	
	c) 	1	3
Q14		1 x 3	3
Q15.	• A defect of vision due to which a person can see far off objects clearly but cannot see nearby objects distinctively	1	
	• Causes- Focal Length of the eye lens is too long	½	
	Eye ball has become too small	½	

	• 	1	3
	N' – Near point of a normal		
	N – Near point of the defective eye.		
Q16.	• Brief Description of the apparatus/ procedure	1 ½	
	• Observation	½	
	• Conclusion	1	3
Q17.	• Saves energy that is wasted in segregation, Disposal becomes quick.	½ + ½	
	• Two arguments		
	i) Clean environment essential for good health, saves from mosquito etc., Foul smell.	½	
	ii) Garbage may cause diseases	½	
	• Sincerity, seeks co-operation, helpful, concern about environment (any two)	½ + ½	3
Q18.	a) In a food chain the energy moves progressively through the various trophic levels and is no longer available to the organisms of previous level/ energy captured by the autotrophs does not revert back to the solar input; because only 10% of energy is transferred to the next level and the rest of it is either utilized or lost to the environment.	1 ½	
	b) Decomposers (Microorganisms – Bacteria/ Fungi) break down the dead remains and waste products (Complex organic substances) into simpler organic substances, that go into the soil. Hence, their role is very important.	1 ½	3
Q19.	23 pairs/ 22 pairs + 1 pair of sex chromosomes	½	
	One pair / 2 chromosomes	½	
	Two types/ X and Y	½	

	 Conclusion: Thus it is a matter of chance that 'X' carrying egg is fertilized by an 'X' carrying sperm resulting in a female or by a 'Y' carrying sperm resulting in a male child.	½ ½ + ½ ½ + ½ 1	5

Q20.			
	• Diagram	½	
	• Any three correct labelling	3 x ½	
	• Female reproductive organs –		
	Identification and function –		
	Ovary – produces egg cell	½, ½	
	Stigma – receives pollen grains	½, ½	
	Style – tube grows out of the pollen grains and travels through the style to reach ovary/ transports male germ cells to ovary	½, ½	5
Q21.	a) Convex mirrors/ Diverging mirror	½	
		1 ½	
	As rear view mirrors in vehicle; wider field of view	½ + ½	
	b)		
	Given u = -20cm; v = +10cm	½	
	As $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$		
	$\therefore f = \frac{uv}{u+v} = \frac{-20 \times 10cm}{-20+10} = \frac{-200cm}{-10} = +20cm$	½ + ½	
	The mirror is convex/ diverging	½	5

Q22.			
	Note:		
	• White light	½	
	• Direction of rays	½	
	• Splitting of white light into seven colours at the point of incidence	½	
	• V I B G Y O R (order of colours should be shown correctly)	½	
		1	
	Note:		
	• Final emergent ray (white light) should be parallel to the incident ray.	1	
	• Dispersion (R – V) in the first prism and recombination in the second prism should be shown.	1	5
Q23.	a) • In the modern periodic table 18 groups and 7 periods.	1	
	• Atomic size increases down the group due to the addition of one shell successively.	1	
	b) A (2, 8, 7); B – (2, 8, 7); C – (2, 8, 2); D – (2, 8, 8, 2)		
	i) A will form acidic oxide because only one electron is required to attain noble gas configuration/ because it is a nonmetal.	½ + ½	
	ii) A will have smallest atomic radius because it is an element of 3rd period and 17th group.	½ + ½	
	iii) A and B – Monovalent	1	5
Q24.	• Carbon has <u>four</u> electrons in its outermost shell, it cannot form either <u>C^{4+}</u> cations or <u>C^{4-} anions</u>, due to large amount of <u>energy</u> involved, so sharing of electrons takes place and carbon forms only compounds with covalent bond.	½ x 4	
	Reasons:		
	• Catenation	1	
	• Tetravalency of carbon	1	
	• Due to the small size of carbon atom, its nucleus is able to hold on to the shared pair of electrons strongly.	1	5
	SECTION – B		
	25) D 26) B 27) C		

	28) B	29) C	30) A		
	31) A	32) A	33) D	1 x 9	9
Q34.				4 x ½	2
Q35.	Wrong marking of F_2 and $2F_2$				
	∵ Object between F_1 and $2F_1$				
	∴ Image should be beyond $2F_2$ and image should be magnified.			½ + ½	
	(any two)				
				1	2
Q36.	A. Clear solution is obtained				
	B. No change in colour				
	C. Blue litmus solution turns red.				
	D. Red solution.			½ x 4	2

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

Marking Scheme – Science (Vocational) 531/3

1. The Marking Scheme provides general guidelines to reduce subjectivity in the marking. It carries only suggested value points for the answer. These are only guidelines and do not constitute the complete answer. Any other individual response with suitable justification should also be accepted even if there is no reference to the text.

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.

3. If a question has parts, please award marks in the right hand side for each part. Marks awarded for different parts of the question should then be totalled up and written in the left hand margin.

4. If a question does not have any parts, marks be awarded in the left hand side margin.

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.

6. Wherever only two/three of a 'given' number of examples/factors/points are expected only the first two/three or expected number should be read. The rest are irrelevant and should not be examined.

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.

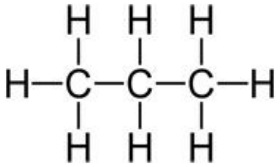
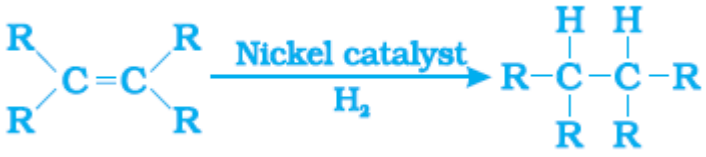
8. All the Head Examiners / Examiners are instructed that while evaluating the answer scripts, if the answer is found to be totally incorrect, the (X) should be marked in the incorrect answer and awarded ‘0’ marks.

9. ½ mark may be deducted if a candidate either does not write units or writes wrong units in the final answer of a numerical problem.

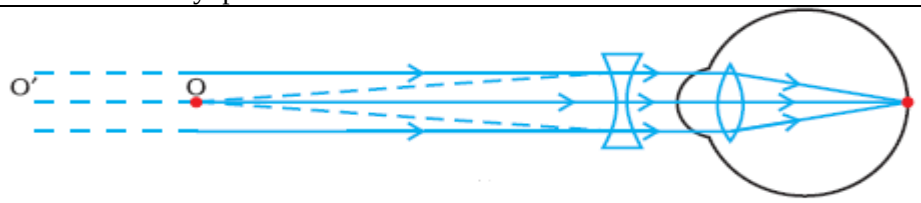
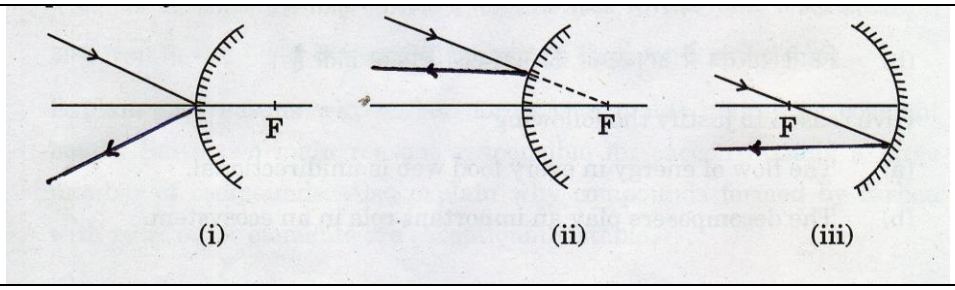
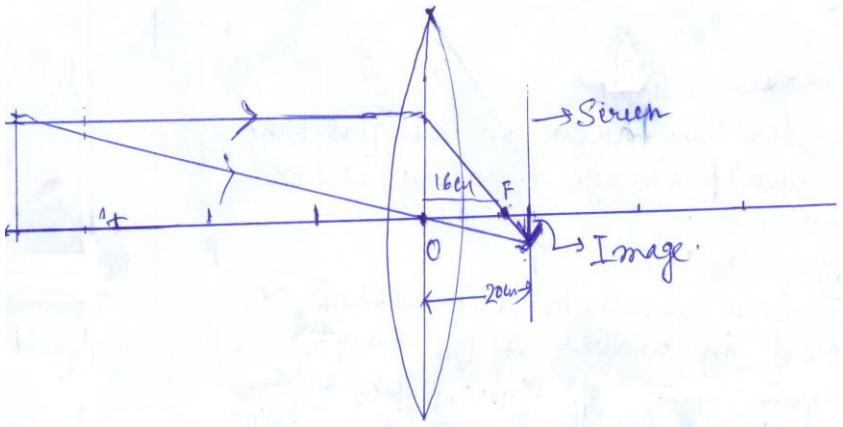
10. A full scale of mark 0 to 100 has to be used. Please do not hesitate to award full marks if the answer deserves it.

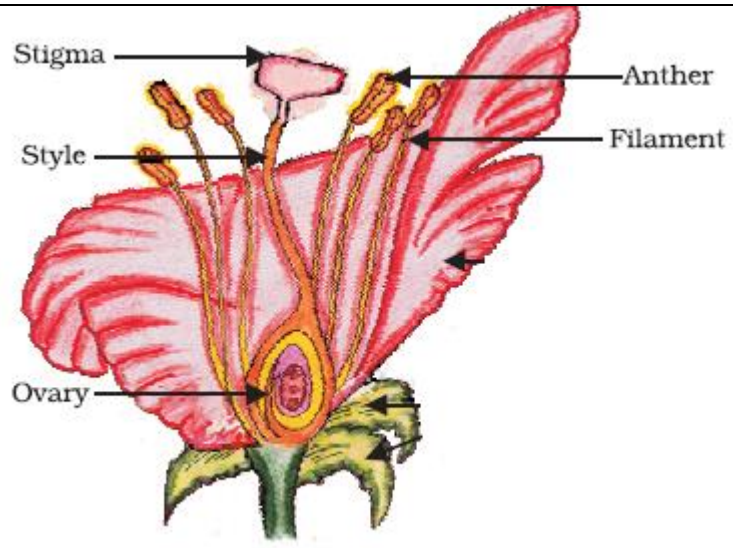
11. As per orders of the Hon’ble Supreme Court the candidates would now be permitted to obtain photocopy of the Answer Book on request on payment of the prescribed fee. All Examiners/Head Examiners are once again reminded that they must ensure that evaluation is carried out strictly as per value points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

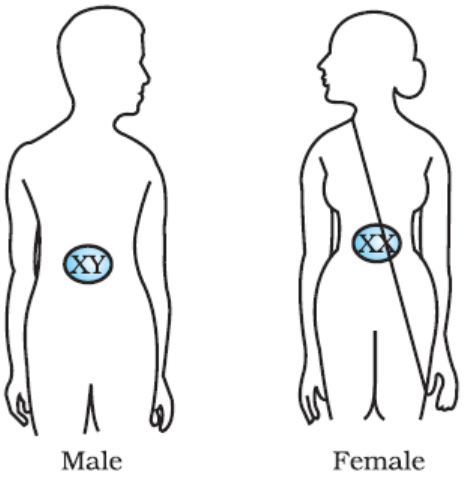
MARKING SCHEME **Code No. 531/3**
CLASS X – VOCATIONAL

	Expected Answer/ Value point	Marks	Total
	SECTION – A		
Q1.	Ethanol; C_2H_5OH	½ , ½	1
Q2.	 ; **Ten** Propane	½ , ½	1
Q3.	• To produce sperms • To produce male hormone/ Testosterone	½ ½	1
Q4.	• Ability of a lens to converge/ diverge/ bend the light rays falling on it. • S I unit is dioptre and it is defined as the power of a lens whose focal length is 1 metre.	1 1	2
Q5.	• Sperm and ova • Sperm has XY chromosomes Ova has XX chromosomes Or Sperm is structurally long with a tail whereas ova is round Or Sperm is motile whereas ova is non motile	½ , ½ ½ , ½	2
Q6.	• Disposal of industrial effluents/ untreated sewage/ dead remains/ sacred waste (any two) • Spread water-borne diseases • Consumption of contaminated food (fishes, vegetables etc)	½ , ½ ½ , ½	2
Q7.	•  (or any other) Addition of H_2 to the molecule of an unsaturated hydrocarbon in the presence of a catalyst to form a saturated hydrocarbon. • Essential conditions; Presence of catalyst like Ni/ Pd/ Pt and hydrogen • Liquid state of a compound changes into corresponding solid state Boiling Point/ Melting Point increases	1 1 ½ ½	3

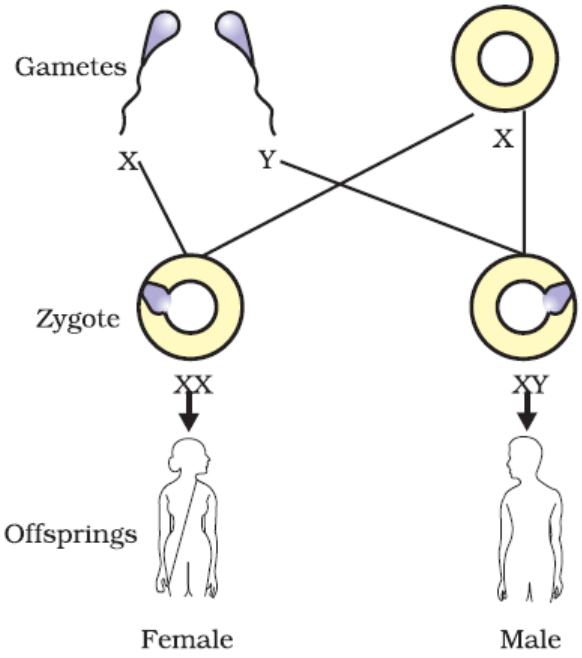
	(any one)			
Q8.	a) K (19) – 2, 8, 8, 1 b) Be (4) and Ca (20) c) KX/ KCl ; Ionic/ Electrovalent compound		½ , ½ ½ , ½ ½ , ½	3
Q9.	• Pollination: Transfer of pollen grains from anther to stigma		1	
	• Self pollination	Cross pollination		
	Transfer of pollen occurs in the same flower from stamen to stigma	Transfer of pollen occurs from one flower to another	½ , ½	
	• Reason: The pollen is provided by the anther of some other flower of the same species and fertilization takes place/ Due to cross pollination		1	3
Q10.	Four methods of Contraception –			
	i) Mechanical or Barrier / Condoms		½	
	ii) Oral Pills		½	
	iii) Copper-T		½	
	iv) Surgical Methods/ Vasectomy/ Tubectomy		½	
	• Health of women is maintained and parents can give more attention to their children.		½	
	• More resources may be made available for the improvement of living standard thereby nation becomes prosperous.		½	3
Q11.	Description of Mendel's experiment			
	• Mendel in his experiment selected garden pea plant with contrasting character such as tall and dwarf and crossed them and raised F_1 generation.			
	• He observed that only one of the two contrasting characters appeared in the F_1 generation and the other did not appear.			
	• In order to find out about the character which did not appear in F_1 generation, if it was inherited or not, he raised F_2 generation by selfing the plant of F_1 generation.			
	• This time he observed that the character which did not appear in F_1 generation, showed its appearance in some plants of F_2 generation.			
	• He thus interpreted that out of each pair of contrasting characters one was dominant and the other was recessive.			
	• The dominant appeared in F_1 generation and the recessive appeared in some plants of the F_2 generation.		½ x 6	3
Q12.	a) Homologous organs- Suggest that the organs having same structure but performing different functions have evolved from common ancestor. Eg: Forelimbs of man, birds, frog lizard. b) Analogous organs- show adaptation of organs with different internal structure for a common use not showing a common ancestry. Eg: wings of butterfly and wings of bats. c) Fossils- provide the connecting links between two species. Example: Fossils of Archaeopteryx/ Dinosaurs with feathers provide the connecting link between reptiles and birds.		½ ½ ½ ½ ½ ½	3

Q13.	• <u>Scattering of light</u> –A phenomenon of spreading of light (diffused reflected light) caused by the minute particles in the atmosphere. • The sky appears blue as the blue component of sun rays scatters much more strongly than the red component by the air particals. • At sun rise, the blue component of the sun rays gets scattered while passing through the thicker layers of the atmosphere, and the red component reaches our eye.	1 1 1	3
Q14.	Inability of an eye to see the distant objects clearly.	½	
	Two causes:		
	i) Excessive curvature of the eye lens	½	
	ii) Elongation of the eye ball.	½	
	Correction for myopia		
		1 ½	3
Q15.		1, 1, 1	3
Q16.	a) Convex lens as real images can only be formed by convex lens.	1	
	b) For Convex lens, given		
	$u = -80\ \text{cm}$; $v = +20\ \text{cm}$		
	i) Distance between the object and the image is = (80 + 20) cm = 100 cm.	½	
	ii) Magnification $m = \frac{v}{u} = \frac{20\text{cm}}{-80\text{cm}} = -\frac{1}{4}$	½	
	c) 	1	3

Q17.	• Water harvesting – A technique of increasing the level / recharge of ground water by capturing and storing the rain water by constructing water harvesting structures. • Four advantages--- Reduces run off loss and avoid floods. Meets the ever increasing demand of water. Recharge well/ ground water if stored underground. Provides moisture for vegetation over a wide area. Water remains unpolluted/ clear by not allowing polluting particles. (any four)	1 ½ x 4	3
Q18.	• Saves energy that is wasted in segregation, Disposal becomes quick.	½ + ½	
	• Two arguments		
	i) Clean environment essential for good health, saves from mosquito etc., Foul smell.	½	
	ii) Garbage may cause diseases	½	
	• Sincerity, seeks co-operation, helpful, concern about environment (any two)	½ + ½	3
Q19.			
	• Diagram	½	
	• Any three correct labelling	3 x ½	
	• Female reproductive organs –		
	Identification and function –		
	Ovary – produces egg cell	½, ½	
	Stigma – receives pollen grains	½, ½	
	Style – tube grows out of the pollen grains and travels through the style to reach ovary/ transports male germ cells to ovary	½, ½	5
Q20.	23 pairs/ 22 pairs + 1 pair of sex chromosomes	½	
	One pair / 2 chromosomes	½	
	Two types/ X and Y	½	



½



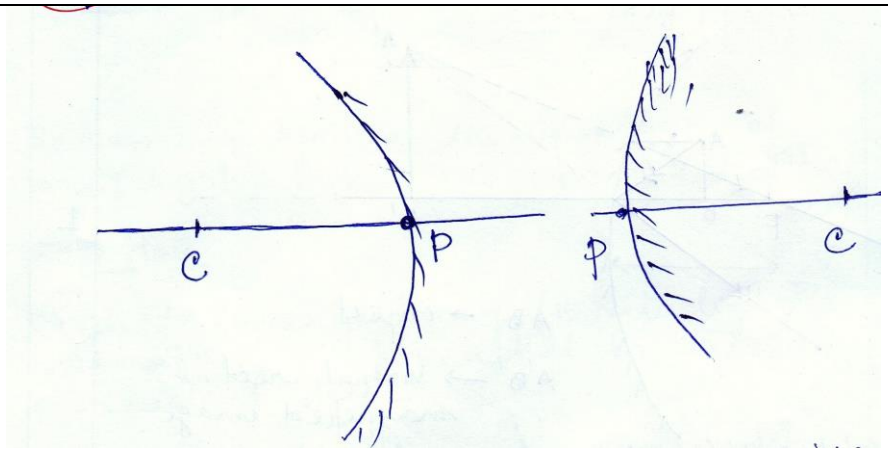
½ + ½

½ + ½

Conclusion: Thus it is a matter of chance that 'X' carrying egg is fertilized by an 'X' carrying sperm resulting in a female or by a 'Y' carrying sperm resulting in a male child.

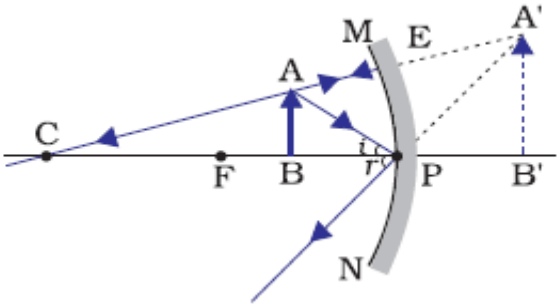
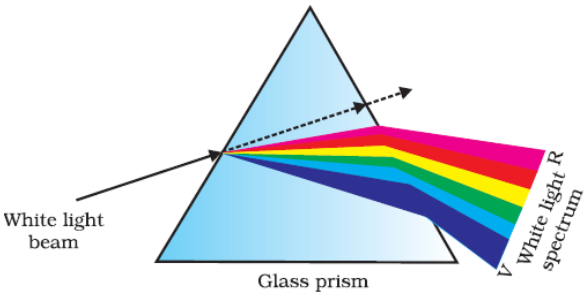
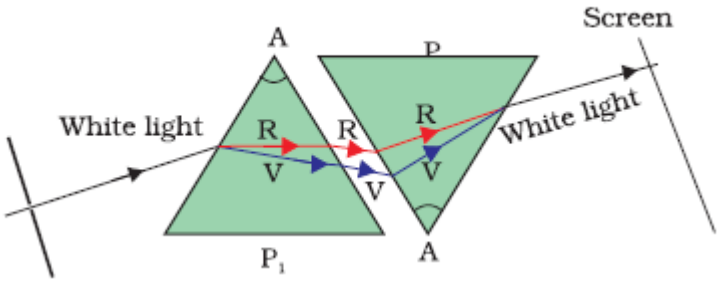
1 | 5

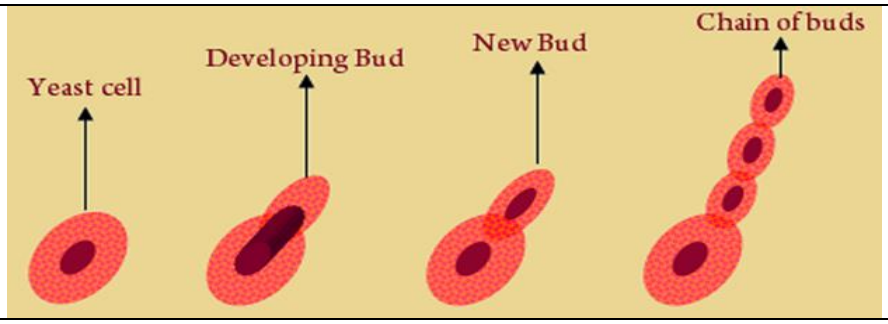
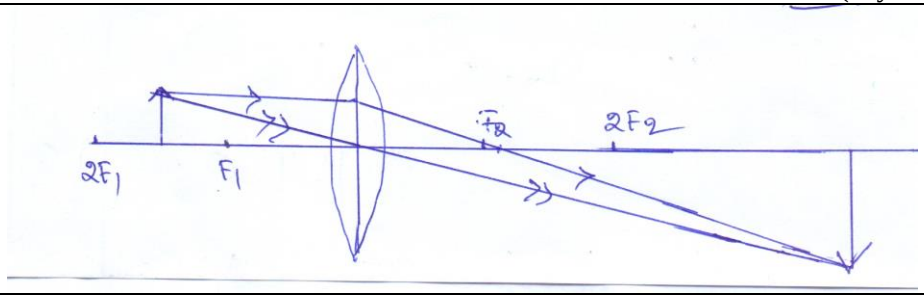
Q21. a)



Concave Mirror Convex Mirror

½ + ½

	• For marking P and C	½	
	i) Pole (P) – The centre of the reflecting surface of a spherical mirror	½	
	ii) Centre of curvature (C) – The centre of the sphere of which the spherical mirror is a part.	½	
	iii) Principal axis (PC) – An imaginary line passing through the pole and the centre of curvature of the spherical mirror.	½	
	b) i) Concave mirror	½	
	ii) ∵ f = – 15 cm = focal length		
	∴ Range of Object distance < 15 cm	½	
	iii) 	1	5
	Note: ½ mark be deducted if arrow is not shown.		
Q22.			
	Note:		
	• White light	½	
	• Direction of rays	½	
	• Splitting of white light into seven colours at the point of incidence	½	
	• V I B G Y O R (order of colours should be shown correctly)	½	
		1	
	Note:		
	• Final emergent ray (white light) should be parallel to the incident ray.	1	
	• Dispersion (R – V) in the first prism and recombination in the second prism should be shown.	1	5

Q23.	• Carbon has <u>four</u> electrons in its outermost sheet, it cannot form either $\underline{C^{4+}}$ cations or $\underline{C^{4-}}$ <u>anions</u>, due to large amount of <u>energy</u> involved, so sharing of electrons takes place and carbon forms only compounds with covalent bond.			½ x 4	
	Reasons:				
	• Catenation			1	
	• Tetravalency of carbon			1	
	• Due to the small size of carbon atom, its nucleus is able to hold on to the shared pair of electrons strongly.			1	5
Q24.	a) • In the modern periodic table 18 groups and 7 periods.			1	
	• Atomic size increases down the group due to the addition of one shell successively.			1	
	b) A (2, 8, 7); B – (2, 8, 1); C – (2, 8, 2); D – (2, 8, 8, 2)				
	i) A will form acidic oxide because only one electron is required to attain noble gas configuration/ because it is a nonmetal.			½ + ½	
	ii) A will have smallest atomic radius because it is an element of 3rd period and 17th group.			½ + ½	
	iii) A and B – Monovalent			1	5
	SECTION – B				
	25) D	26) A	27) A		
	28) B	29) C	30) A		
	31) D	32) B	33) C	1 X 9	9
Q34.	A. Clear solution is obtained				
	B. No change in colour				
	C. Blue litmus solution turns red.				
	D. Red solution.			½ x 4	2
Q35.				4 x ½	2
Q36.	Wrong marking of F_2 and $2F_2$				
	∵ Object between F_1 and $2F_1$				
	∴ Image should be beyond $2F_2$ and image should be magnified.			½ + ½	
	(any two)				
				1	2