Strictly Confidential- (For Internal and Restricted Use Only) **Secondary School Examination**
SUMMATIVE ASSESSMENT - II
March 2016

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.	Methane, CH_4	½, ½	1
Q2.	Banana, Rose, Jasmine (or any other example) (Any two)	½, ½	1
Q3.	20 J	1	1
Q4.	Infinity, convex mirror	½, ½	
	In vehicles to see the rear view.	1	2
Q5.	Biodiversity is the existence of a wide variety of species of plants, animals and microorganisms in a natural habitat within a particular environment.	1	
	Advantages of conserving:		
	• Forest prevent soil erosion/ check flood/ provide habitat to animals.	½	
	• Wildlife maintains ecological equilibrium/ maintains balance of food web.	½	2
Q6.	The problems caused by non-biodegradable waste are as follows:-		
	(i) Water pollution that makes water unfit for drinking	½	
	(ii) They cause land pollution leading to loss of fertility of soil	½	
	(iii) They cause stoppage of flow of water in drains/ may block drains.	½	
	(iv) They cause air pollution.	½	2
Q7.	(b) (i) C_4H_8 (ii) C_6H_{10}	1 ½ +1 ½	
	Note: Part (a) withdrawn and mark adjusted in (b) part.		3
Q8.	Note: Withdrawn, give full credit to each candidate.		3
Q9.	a) Atomic number of an element is the number of protons which is equal to the number of electrons in an atom, which determines the electronic configuration on which the chemical properties of an element depend.	1	
	b) (i) Metallic character decreases from left to right because effective nuclear charge increases along a period.	½, ½	
	(ii) Metallic character increases down the group because effective nuclear charge decreases down the group.	½, ½	3
Q10.	(i) Q has valency 3. Its electronic configuration is 2, 8, 3; It has 3 electrons in valence shell/ outermost shell	½, ½	
	(ii) P and Q are metals as these can lose electrons. R and S are non-metals as these can gain electrons	½, ½	
	(iii) P will form the most basic oxide as it is most metallic.	½, ½	3
Q11.	Reproduction is the process by which living organisms produce their own types/ create new individuals that look very much like themselves	1	
	Advantages:		
	(i) Sexual reproduction produces variation among the organisms.	1	
	(ii) Organisms produced by sexual reproduction have better chances of survival.	1	3

Q12. a) Multicellular organisms with simple body organisation break up into two or more small pieces or fragments. upon maturation these fragments grow into new individuals. e.g. Spirogyra. 1 + ½

b) • Regeneration is carried out by specialized cells which proliferate and make large number of cells. Thus undergoing changes to become various cell types and tissues.

• Presence of specialized cells is required. 1 + ½ 3

Q13. a) Fertilization is possible if sperm meets the ovum within one day of its release. 1

b)

	Sperm	Ovum
(i)	It is long	It is oval or rounded
(ii)	It is motile	It is non-motile
(iii)	Released in large numbers	Only one is released per menstrual cycle

(Any two) 1+1 3

(or any other point)

Q14. Factors responsible for rise of new species are: 1

(i) Genetic drift – Sudden changes in genetic material due to chance factor.

(ii) Natural selection – Nature selects organisms which have favourable variation. 1

(iii) Changes in DNA / Mutation/Errors in DNA copying 1

3

Q15. Nature of spherical lens – Convex ½

Given: $u = -45$ cm, $v = +90$ cm, $h_1 = +2$ cm.

Using lens formula

$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$$ ½

$$= \frac{1}{+90} - \frac{1}{-45}$$

$$= \frac{1}{90} + \frac{1}{45}$$

$$= \frac{3}{40} = \frac{1}{30}$$

Therefore, $f = +30$ cm ½

Focal length of convex lens is 30 cm.

Again, $m = \frac{h_2}{h_1} = \frac{v}{u}$ ½

$$h_2 = \frac{v \times h_1}{u} = \frac{90 \times 2}{-45} = -4\,\text{cm}$$ ½

So, height of image is 4 cm. ½ 3

Q16. To let rainwater recharge ground water by water harvesting is a better option. 1

Advantages are:

- Recharges wells
- It is not lost by evaporation
- It does not become a breeding place for mosquitoes
- Provides moisture for vegetation

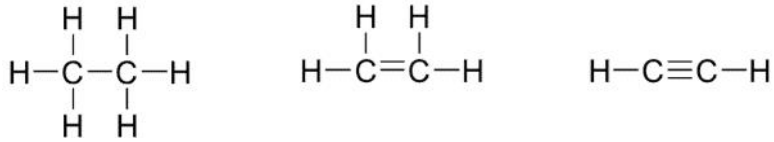
- Prevents ground water from contamination due to human and animal wastes.

(Any four) ½ x 4 3

Q17. a) Ciliary muscles. ½
When the muscles are relaxed, the lens become thin and its focal length increases, which enable the eye to see distant objects clearly. When the muscles contract, the lens become thicker and the focal length decreases which helps the eye in seeing the closer objects. 1
b) Myopia or short sightedness ½
c) Function of iris: controls the size of pupil 1 3

Q18. a) It is not ethical to call someone based on his skin colour. Because it is against the human values. ½ + ½
b) Skin colour is an inherited trait. It is due to DNA copying / transfer of characters from parents to progeny/ offspring. ½, ½
c) The school authorities can advise all the students to behave responsibly. The students should be explained that any discrimination based on skin colour is not acceptable in the society/ Regular counselling/ Moral talks in morning Assembly. 1 3

Q19. Hydrocarbons: compounds of carbon and hydrogen are called hydrocarbons. 2



C_2H_6 C_2H_4 C_2H_2

3 x 1 5

Q20. a)
- The preserved traces of living organisms are called fossils.
- When organisms die, their bodies decompose due to action of microorganisms. However, sometimes the body or at least some parts of the body may be in such an environment that does not let it decompose completely. 1 + 1

The age of fossils can be estimated by following two methods:
- The fossils closer to the earth's surface are more recent to those found in deeper layers.
- Radio-carbon dating: By detecting the ratios of different isotopes of the same element in the fossil material. ½ x 2

b)
- Fossils and their study help us in knowing about the species which are no longer alive.
- They provide evidence and missing links between two classes.
- They help in deciding evolutionary relationship among living organisms

(Any two) 1 + 1 5

Q21. a) A – Stigma
B – Pollen tube
C – Ovary
D – Female germ cell ½ x 4
b)
- Transfer of pollen grains from the anther to the stigma of flower.
- It ensures fertilization ½ x 2

c) The male germ cell produced by pollen grain fuses with the female gamete 1 5

present in the ovule.
(i) Ovule ½ x 2
(ii) Ovary

Q22. a) Scattering of light : Phenomenon of spreading of light (diffused reflected light) caused by minute particles (dust, smoke etc) present in the atmosphere. 1

Very fine particles scatter mainly blue light and large size particles scatter red light. 1

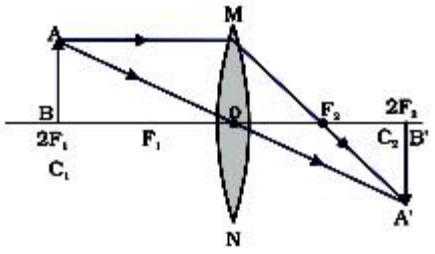
b) i) Moon has no atmosphere, hence no scattering of light takes place due to which sky appears dark. 1

ii) In the absence of water droplets in the atmosphere rainbow is not formed. 1

c) Light from the sun overhead travel relatively shorter distance. At noon, the sun appears white as only a little of the blue and violet colours are scattered. 1 5

Q23. a) Convex lens ½

(i) Object at 2F ½



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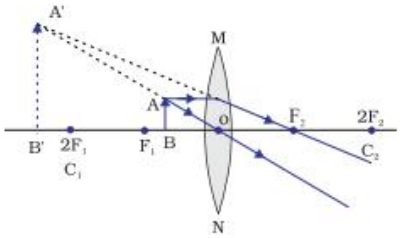
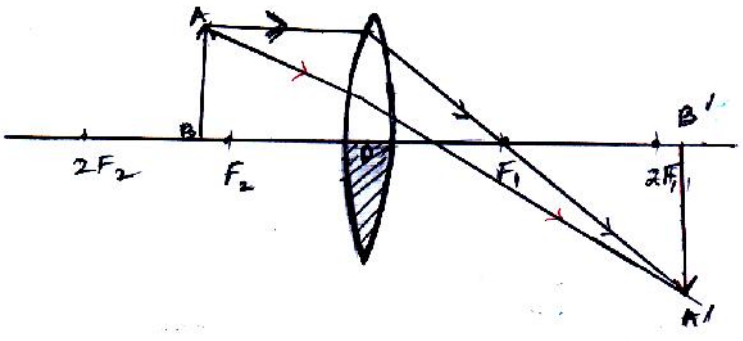
(ii) Between F_1 and optical centre ½



1

b) Yes, even when half of the lens is covered with black paper, complete image is formed. ½



1 5

Q24. $R = 20$ cm; $f = 10$ cm; $h_1 = 4$ cm; $u = -20$ cm.

$\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$ or $\frac{1}{v} = \frac{1}{f} - \frac{1}{u}$ ½

$\frac{1}{v} = \frac{1}{10} - \left(-\frac{1}{20}\right) = \frac{1}{10} + \frac{1}{20} = \frac{2+1}{20}$ ½

$\frac{1}{v} = \frac{3}{20}$ or $v = \frac{20}{3}$ cm 21/2

$m = \frac{v}{u} = \frac{20}{3/20} = \frac{20}{3 \times 20} = +\frac{1}{3}$ virtual image 1

$h_1 = 4\,\text{cm}$ $h_2 = m \times h_1$ $= 4 \times \frac{1}{3} = \frac{4}{3}$ cm ½

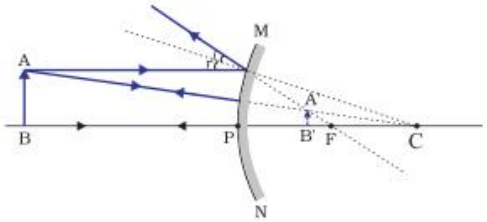


Diagram 1
Position marking 1 5

SECTION – B

25 (c)	26 (c)	27 (d)		
28 (d)	29 (c)	30 (b)		
31 (a)	32 (c)	33 (c)	9 x 1	9

Q34. Potato is an underground stem and sweet potato is a root. They are analogous organs as both of them perform the same function, that is, storage of food. 1 + 1 2

Q35. a) Towards the lens
b) Decreases 1 + 1 2

Q36. (i) It smells like vinegar.
(ii) Blue litmus turns red in acetic acid. 1 + 1 2