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

Marking Scheme – Science (Vocational) 531/2

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. 531/2**
CLASS X – VOCATIONAL

	Expected Answer/ Value point	Marks	Total
	SECTION – A		
Q1.	Ethyne; C_2H_2	½ , ½	1
Q2.	Genetic material/ Heredity material	1	1
Q3.	500J	1	1
Q4.	i) Virtual ii) Erect iii) Diminished iv) Point sized	½ x4	2
Q5.	The problems caused by non-biodegradable waste are as follows:- (i) Water pollution that makes water unfit for drinking (ii) They cause land pollution leading to loss of fertility of soil (iii) They cause stoppage of flow of water in drains/ may block drains. (iv) They cause air pollution.	 ½ ½ ½ ½	 2
Q6.	Biodiversity is the existence of a wide variety of species of plants, animals and microorganisms in a natural habitat within a particular environment. Advantages of conserving: • Forest prevent soil erosion/ check flood/ provide habitat to animals. • Wildlife maintains ecological equilibrium/ maintains balance of food web.	1 ½ ½	 2
Q7.	Note: Withdrawn, give full credit to each candidate.		3
Q8.	i) Odour: Alcohol- characteristic smell Carboxylic acid- vinegar like smell/ pungent smell ii) Litmus paper test: Alcohol does not change the colour of litmus paper Carboxylic acids turn blue litmus red	 1 ½ 1 ½	 3
Q9.	a) Period – 4; because it has four shells b) Group – 2; because it has two electrons in the outermost shell Compound − XY X = 2,8,8,2 ; Y= 16 = 2,8,6 Both have valency 2	½ , ½ ½ , ½ ½ ½	 3
Q10.	a) Group 17, Period 3 b) 17, It is non-metallic because it has 7 valence electrons (it can gain one electron easily forming negative ion) c) Chlorine; Bromine or Iodine or Fluorine are chemically similar to chlorine.	½, ½ ½, ½ ½, ½	 3
Q11.	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. 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 1 + ½	 3

Q12. a) Four reasons for adopting contraceptive methods are:
(i) To increase the gap between two children
(ii) To prevent unwanted pregnancy
(iii) To prevent transmission of STD
(iv) To control population growth — 4 x ½

b) No, because it does not provide a physical barrier between the male and female reproductive organs. — ½, 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 Speciation: The process of formation of a new species from a pre-existing one. — 1

Four Factors: i) Genetic drift ii) Mutation iii) Natural selection iv) Geographical isolation — 4 x ½

- Geographical isolation cannot be a major factor in the speciation of a self pollinating plant species. — ½

Reason: Physical barrier cannot be created in self- pollinating plants

Note: Full credit to all candidates for this question — ½ — 3

Q15. 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

Q16. (i) The sun appears red in colour early in the morning. During early morning the sun is at the horizon and the light from the sun passes through thicker layers of air and large distance in air. Most of the short wavelengths are scattered away by the particles of the atmosphere and only red light of longer wavelength reaches our eyes. — 1

(ii) At noon, the sun appears white as the sun is overhead and light from it would travel a shorter distance in the air. Only a little of the blue and violet colours are scattered. — 1

The sky appears dark to an astronaut as scattering does not take place at very high altitude due to the absence of atmosphere. — 1 — 3

Q17. For a convex lens

h_1 = 6 cm; f = 15 cm; u = −10 cm; v = ?

Using lens formula: $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$ — ½

$\frac{1}{15} = \frac{1}{v} - \frac{1}{-10} = \frac{1}{v} + \frac{1}{10}$

Therefore, $\frac{1}{v} = \frac{1}{15} - \frac{1}{10} = \frac{2-3}{30} = \frac{-1}{30} = v = -30\,\text{cm}$ 1

Thus the image is formed on the same side as the object at a distance of 30 cm from the optical centre of the lens.

Negative sign of '*v*' indicates that image is virtual. ½

$$m = \frac{h_2}{h_1} = \frac{v}{u}$$

$$h_2 = \frac{v}{u} \times h_1 = \frac{-30}{-10} \times 6 = +18\,\text{cm}$$ ½

Thus image formed is three times larger in size than the size of the object.

Positive sign indicates the image is erect ½ 3

Q18. 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

Q19 a)There are two C-C bonds and eight C-H bonds in one molecule of propane ½, ½

b)

- Carbon has four electrons in its outermost shell and needs to gain or lose four electrons to attain noble gas configuration. 1
- It is difficult to form C^{4-} ion as the nucleus cannot hold into four extra electrons, neither it could lose four electrons to form C^{4+} ion because of large amount of energy. So Carbon shares four electrons to form covalent bond ½ ½
- Due to catenation/carbon-carbon long chains ½
- Tetravalency ½
- Small size of carbon atoms 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

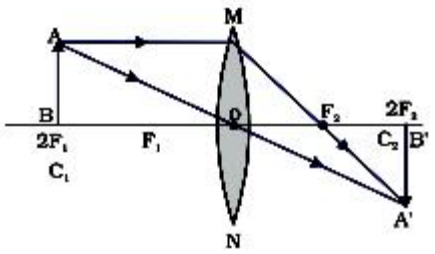
Q21. a) A – Stigma
B – Pollen tube
C – Ovary
D – Female germ cell ½ x 4

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 present in the ovule. 1

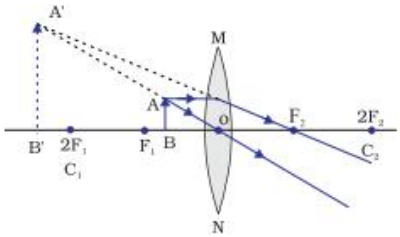
(i) Ovule
(ii) Ovary ½ x 2 5

Q22. a) Convex lens ½
(i) Object at 2F ½



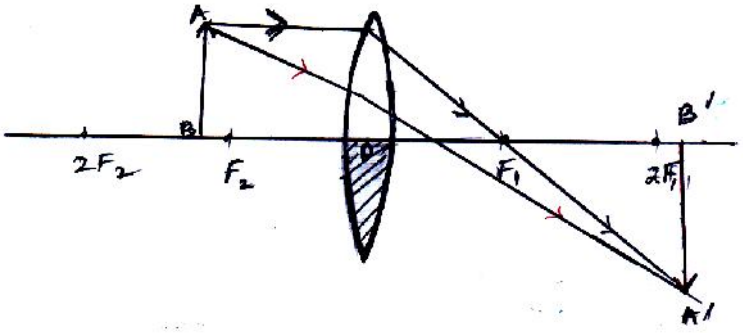
1

(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

Q23 Given $m = -2$

$$m = -\frac{v}{u}$$ ½

$$-\frac{v}{u} = -2 \quad \Rightarrow v = 2u$$ ½

$2u - u = 25$ cm => $u = 25$ cm $v = 2 \times 25 = 50$ cm 1

$\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$

$\frac{1}{f} = \frac{1}{(-50)} + \frac{1}{(-25)}$ 1

$\frac{1}{f} = \frac{-1-2}{50}$ => $f = -50/3$ cm => -16.67 cm 1

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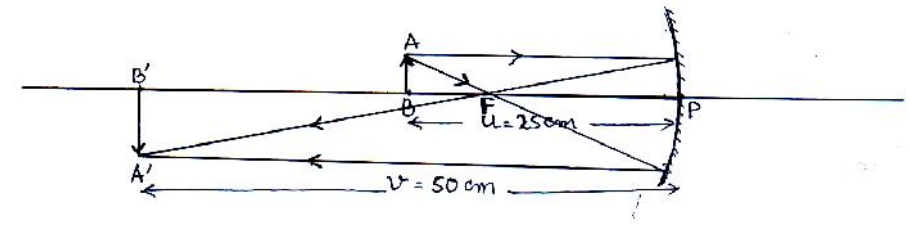

1 5

Q24. a) • Iris and pupil. ½ + ½

• Iris controls the size of the pupil. In dim light iris increases the size of the pupil allowing more light to enter the eye while in bright light, pupil 1

becomes smaller restricting the amount of light entering the eye. 1

b) The light sensitive cells in the retina get activated on illumination by the image formed on the retina and generate electrical impulses that are sent to the brain by way of optic nerve for further processing. 1

c) (i) Propagating eye donation among friends and neighbours

(ii) Make it an activity in NSS programme.

(or any other) ½ + ½ 5

SECTION – B

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

Q34. a) Towards the lens

b) Decreases 1 + 1 2

Q35. (i) It smells like vinegar.

(ii) Blue litmus turns red in acetic acid. 1 + 1 2

Q36. 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