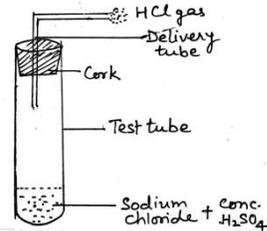**Strictly Confidential: (For Internal and Restricted use only)**
**Secondary School Examination-2020**
<span style="color:red">**Marking Scheme –  SCIENCE**</span>
<span style="color:red">**(SUBJECT CODE :086) (PAPER CODE –31/2/2 )**</span>

**General Instructions: -**

1. You are aware that evaluation is the most important process in the actual and correct assessment of the candidates. A small mistake in evaluation may lead to serious problems which may affect the future of the candidates, education system and teaching profession. To avoid mistakes, it is requested that before starting evaluation, you must read and understand the spot evaluation guidelines carefully.**Evaluation is a 10-12 days mission for all of us. Hence, it is necessary that you put in your best effortsin this process.**

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. **However, while evaluating, answers which are based on latest information or knowledge and/or are innovative, they may be assessed for their correctness otherwise and marks be awarded to them. In class-X, while evaluating two competency based questions, please try to understand given answer and even if reply is not from marking scheme but correct competency is enumerated by the candidate, marks should be awarded.**

3. The Head-Examiner must go through the first five answer books evaluated by each evaluator on the first day, to ensure that evaluation has been carried out as per the instructions given in the Marking Scheme. The remaining answer books meant for evaluation shall be given only after ensuring that there is no significant variation in the marking of individual evaluators.

4. Evaluators will mark( √ ) wherever answer is correct.  For wrong answer 'X"be marked.  Evaluators will not put right kind of mark while evaluating which gives an impression that answer is correct and no marks are awarded.  **This is most common mistake which evaluators are committing.**

5. If a question has parts, please award marks on the right-hand side for each part. Marks awarded for different parts of the question should then be totaled up and written in the left-hand margin and encircled.  This may be followed strictly.

6. If a question does not have any parts, marks must be awarded in the left-hand margin and encircled. This may also be followed strictly.

7. If a student has attempted an extra question, answer of the question deserving more marks should be retained and the other answer scored out.

8. No marks to be deducted for the cumulative effect of an error. It should be penalized only once.

9. A full scale of marks <span style="color:red">0-80</span> has to be used. Please do not hesitate to award full marks if the answer deserves it.

10. Every examiner has to necessarily do evaluation work for full working hours i.e. 8 hours every day and evaluate 20 answer books per day in main subjects and 25 answer books per day in other subjects (Details are given in Spot Guidelines).

11. Ensure that you do not make the following common types of errors committed by the Examiner in the past:-
   - Leaving answer or part thereof unassessed in an answer book.
   - Giving more marks for an answer than assigned to it.
   - Wrong totaling of marks awarded on a reply.
   - Wrong transfer of marks from the inside pages of the answer book to the title page.
   - Wrong question wise totaling on the title page.
   - Wrong totaling of marks of the two columns on the title page.
   - Wrong grand total.
   - Marks in words and figures not tallying.
   - Wrong transfer of marks from the answer book to online award list.
   - Answers marked as correct, but marks not awarded. (Ensure that the right tick mark is correctly and clearly indicated. It should merely be a line. Same is with the X for incorrect answer.)
   - Half or a part of answer marked correct and the rest as wrong, but no marks awarded.

12. While evaluating the answer books if the answer is found to be totally incorrect, it should be marked as cross (X) and awarded zero (0)Marks.

13. Any unassessed portion, non-carrying over of marks to the title page, or totaling error detected by the candidate shall damage the prestige of all the personnel engaged in the evaluation work as also of the Board. Hence, in order to uphold the prestige of all concerned, it is again reiterated that the instructions be followed meticulously and judiciously.

14. The Examiners should acquaint themselves with the guidelines given in the Guidelines for spot Evaluation before starting the actual evaluation.

15. Every Examiner shall also ensure that all the answers are evaluated, marks carried over to the title page, correctly totaled and written in figures and words.

16. The Board permits candidates to obtain photocopy of the Answer Book on request in an RTI application and also separately as a part of the re-evaluation process on payment of the processing charges.
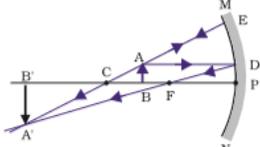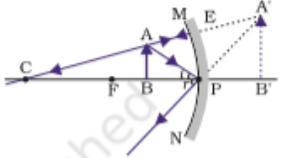
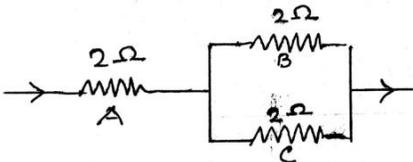| S.NO | Value Points/Expected Answer | MARKS | TOTAL MARKS |
|---|---|---|---|
| | **MARKING SCHEME- CLASS X  SCIENCE  (2019-20)** | | |
| | **QUESTION PAPER CODE : 31/2/2** | | |
| | **SECTION A** | | |
| 1. | Two / Lithium and Beryllium | | 1 |
| 2. | Due to weak intermolecular forces. | | 1 |
| 3. | (a) In the neck region | 1 | |
| | (b) Thyroxine regulates carbohydrate, proteins and fat metabolism in the body./ It promotes growth of body tissue. | 1 | |
| | (c) Excess of secretion of  throxine in the body /overactivity of the thyroid gland | 1 | |
| | (d)  Can be controlled by including iodised salt in our diet. | 1 | 4 |
| | (or any other relevant answer) | | |
| 4. | (a) Are deeper hot regions of earth's crust where molten rocks are formed. | 1 | |
| | (b) New Zealand / United States of America / China/Indonesia, Philippines / Turkey/  New Mexico.                              (Any two) | ½ + ½ | |
| | (c) Electromagnetic Induction. | 1 | |
| | (d) In case of A.C. transmission of power/electricity takes place without  much loss of energy. | 1 | 4 |
| 5. | (b) / Group 13 period 2 OR (b) / $X_2Y$ | | 1 |
| 6. | (b) / Clove oil | | 1 |
| 7. | (d)  /      x= Physical state of $KClO_3$ and $KCl$ y = Reaction condition z= Physical state of $O_2$ | | 1 |
| 8. | (b) / Maharashtra | | 1 |
| 9. | (c)/ Sugarcane and rice  OR (c) / Carbon monoxide | | 1 |
| 10. | (c) /  8Ω | | 1 |
| 11. | (b)/ B,C and D OR (d) /Opaque eye lens | | 1 |
| 12. | (d)  / $R_2 > R_1 > R_3$ | | 1 |
| 13. | (d) / (A) is false, but (R) is true. | | 1 |
| 14. | (a) / Both (A) and (R) are true and (R) is the correct explanation of the assertion. | | 1 |
| | SECTION-B | | |
| 15. | (i) 2 formula units of $CaSO_4$ /Calcium sulphate share 1 molecule of water of crystallization. | 1 | |

| | | | | |
|---|---|---|---|---|
| | (ii) due to its alkaline nature . | | 1 | |
| | (iii) $CuSO_4 .5H_2O \rightarrow CuSO_4 + 5H_2O$ | | | |
| | (Blue) (white) | | 1 | |
| | / Due to loss of water of crystallization. | | | |
| | OR | | | |
| | (i) | | | |
| |  | | 1 | |
| | (ii) Wet litmus paper | | 1 | |
| | (iii) HCl solution , it is due to the formation of $H^+$ ion on in the water / $H_3O^+$ (Hydronium ions) | | ½ + ½ | 3 |
| **16.** | (i) A = CaO / Quick lime/ Calcium oxide | | ½ | |
| | B = Ca(OH)$_2$ / Slaked lime / Calcium hydroxide | | ½ | |
| | (ii) $CaO + H_2O \rightarrow Ca(OH)_2 +$ heat or energy | | 1 | |
| | (iii) Combination reaction | | ½ + ½ | |
| | Exothermic reaction | | | 3 |
| **17.** | (a) (i) BA | | 1 | |
| | (ii) B$_2$C | | 1 | |
| | (Note : B is hydrogen | | | |
| | (b) None | | ½ | 3 |
| | • Because none of them show any characteristics of metal. | | ½ | |
| **18.** | | | | |

| Secretions | Functions |
|---|---|
| (a) mucus | (d)Protects the inner lining of stomach from the acid / softening of food |
| (b) HCl(Hydrochloric acid) | (e)Provides the acidic medium for action of enzyme / Kill the germs. |
| (c) Pepsin | (f) Digest proteins |

½ x 6 → 3

(Note : a,b and c may in any order but there function must match / be given along with the secretion.

| **19.** | (a) Grass $\rightarrow$ Grass hopper $\rightarrow$ Frog $\rightarrow$ Snake | 1 |
|---|---|---|
| | (Or any other relevant example) | |
| | (b) Transfer of food energy to the next higher level will not take place , then the organisms of the upper trophic levels will be affected , increase in the population of the organisms belonging to the previous trophic level / imbalance in the food chain. | 1 |
| | (c) 2000J $\xrightarrow{10\% Law}$ 200 J $\xrightarrow{10\% law}$ 20J | |
| | II Trophic Level     III Trophic Level     IV Trophic Level | 1 |

| | | | | |
|---|---|---|---|---|
| | [If calculation of the amount of energy is not shown , deduct ½ mark .] | | | |
| | OR | | | |
| | (a) (i)  $O_2$ | ½ | | |
| |   (ii)  $O_3$ | ½ | | |
| |   (iii) Breathing /Respiration | ½ | | |
| |   (iv) Absorbs harmful ultra violet (UV) radiations. | ½ | | |
| | (b) $O_2 \xrightarrow{\text{uv}} O + O$ | ½ | | |
| | $O + O_2 \rightarrow O_3$ | ½ | 3 | |
| **20.** | • Fossils are the preserved remains or impressions of the animals/ plants of remote past. | 1 | | |
| | • Two methods: | | | |
| | **(i)** **Relative Methods:** Fossils closer to the surface are more recent than those found in the deeper layers. | ½ ×2 | | |
| | **(ii)** **Dating fossils :** Detecing the ratio of different isotopes of same element in the fossils. | ½ ×2 | 3 | |
| **21.** | (a) To show independent inheritance of traits/ Independent assortment. | 1 | | |
| | (b) In $F_1$ progeny : All dominant traits. | ½ | | |
| | In $F_2$ progeny : original parental and new combinations are visible. | ½ | | |
| |                    (credit marks if examples are written). | | | |
| | (c) 9:3:3:1 | 1 | 3 | |
| **22.** | (i)    Galvanometer (G) shows deflection (for very short time) | 1 | | |
| | (ii)   Galvanometer (G) shows deflection for a very short time in opposite direction to the previous observation. | 1 | | |
| | **Common Reason:** Due to variation in current flowing through coil 1, magnetic field associated with coil 2 changes. Due to which an induced current will generate consequently galvanometer shows momentry defelection. | 1 | 3 | |
| **23.** | (a) (i) Size of eyeball decreases | | | |
| | (ii) Focal length of eye lens is too long / Power of eye lens decreases. | ½ + ½ | | |
| | (b) Diagrams: | | | |
| |  | 1 | | |
| | (c) Hypermetropic Eye | | | |
| |  | 1 | | |
| | Corrected Eye | | | |
| | OR | | | |
| | (a) Small size particles scatter shorter wavelength (violet)  or large sized particles scatter larger wavelength (Red). | 1 | | |
| | (b) Due to variation in physical condition of hot air. | 1 | | |
| | (d) Diagram | | | |

| | | | | |
|---|---|---|---|---|
| |   (Splitting of white light is essential ) | | 1 | 3 |
| **24.** | (i)  | | 1 | |
| | (ii)  | | 1 | |
| | (iii)  | | 1 | 3 |

SECTION C

| | | | | |
|---|---|---|---|---|
| **25** | (a) | | | |
| | • **Homologous series** is a group of compounds which have the same functional group , same general formula and where to successive member differ by – $CH_2$ in the molecular formula | 1 | | |
| | Example : $CH_3$-OH , $CH_3$ -$CH_2$-OH | | | |
| | Functional group :   -OH , General Formula : $C_nH_{2n}$ OH | 1 | | |
| | (b) **Esterification** : The reaction of carboxylic acid with an alcohol in the presence of $H_2SO_4$ yields an ester. | | | |
| | $CH_3COOH + C_2H_5OH \xrightarrow[\text{Heat}]{\text{Conc .}H_2SO_4} CH_3COOC_2H_5 + H_2O$ (Ester) (If word equation given award full marks) | 1 ½ | | |
| | **Addition Reaction** : A reaction in which two or more atoms are added across a double or triple bond in presence of catalyst is called addition reactions. | | | |
| | $CH_2 = CH_2 + H_2 \xrightarrow{\text{Pt./Pd or Ni}} CH_3 - CH_3$ | 1 ½ | 5 |
| **26.** | (a) (i)    $Al_2O_3 + 6\,HCl \rightarrow 2\,AlCI_3 + 3\,H_2O$ | 1 | |

| | | | |
|---|---|---|---|
| | (ii) $K_2O + H_2O \rightarrow 2 KOH$ | 1 | |
| | (iii) $3 Fe + 4 H_2O \rightarrow Fe_3O_4 + 4 H_2$ | 1 | |
| | | | |
| | (b) $X + CuSO_4 \dashrightarrow$ Displacement reaction | ½ | |
| | $X + ZnSO_4 \rightarrow$ Displacement reaction | ½ | |
| | $X + AgNO_3 \rightarrow$ Displacement reaction | ½ | |
| | $X > Zn > Cu > Ag$ | ½ | |
| | | | |
| | OR | | |
| | (a) | | |
| | (i) Sodium (Na) / Potassium (K) | | |
| | (ii) Iodine (I) | | |
| | (iii) Mercury (Hg) | | |
| | (iv) Gold (Au) | | |
| | (v) Silver / Copper | ½ ×6 | |
| | (vi) Carbon / Sulphur / Phosphorous | | |
| | | | |
| | (b) They are generally stronger / have high tensile strength / high electrical resistivity / resistant to corrosion. | 1 | |
| | (Any two) | | |
| | • Solder : Lead + Tin / Pb + Sn | ½ | |
| | Amalgam - an alloy in which mercury is one of the constituent / Any metal + mercury | ½ | 5 |
| **27.** | (a) | | |
| | • Chemical Method | ½ | |
| | • Barrier Method | ½ | |
| | • Surgical Method | ½ | |
| | | | |
| | (b) Increase in female foeticide / Declining child sex ratio | 1 | |
| | (Any One) | | |
| | Benefit : Maintaining male-female sex ratio for a healthy society | ½ | |
| | | | |
| | (c) Bacterial $\rightarrow$ Gonorrhoea | ½ | |
| | Syphilis | ½ | |
| | | | |
| | Viral $\rightarrow$ Warts | ½ | |
| | AIDS | ½ | |
| | OR | | |
| | | | |
| | (a) (i) Ovary$\rightarrow$ Production of female germ cell/egg | 1 | |
| | Production of hormone – estrogen | | |
| | (Any one) | | |
| | (ii) Oviduct$\rightarrow$ Site of fertilization | 1 | |
| | | | |
| | (b) (i) Thickening of the uterus lining | 1 | |
| | (ii) Wall of uterus breaks/Menstruation occurs. | 1 | |
| | | | |
| | (c) Providing the nutrition / $O_2$/to the developing embryo /foetus or removal of waste from the fetus. | 1 | 5 |
| | | | |

| 28. | (a) In fish : | | |
|---|---|---|---|
| | • 2 chambered heart | ½ + ½ | |
| | • Single Circulation | | |
| | In Human beings: | | |
| | • 4 chambered heart | ½ + ½ | |
| | • Double circulation. | | |
| | b) | | |
| | • The deoxygenated blood from all body parts is collected by the veins to pour into venacava. | | |
| | • Vena cava pours blood into the right atrium(RA). | | |
| | • Right atrium transfers this blood into the right ventricle (RV). | | |
| | • Right ventricle pumps blood to lungs through pulmonary artery. | | |
| | • The oxygenated blood from the lungs is brought to the left atrium (LA) through pulmonary vein. | | |
| | • Now the blood is pumped to left ventricle, from where the blood is distributed to all parts of the body through Aorta. | ½ x 6 | 5 |
| | (If student draws the labeled diagram / flow chart , credit marks) | | |
| 29. | (a) | | |
| | (i) Real and magnified | | |
| |  | 1 ½ | |
| | Object distance must be between 10 to 20 cm | | |
| | (ii) Virtual and magnified | | |
| |  | 1 ½ | |
| | Object distance must be less than 10 cm | | |
| | (b) f = 10 cm ; u = - 10 cm | | |
| | $$\frac{1}{v}+\frac{1}{u}=\frac{1}{f}$$ | ½ | |
| | $$\frac{1}{v}=\frac{1}{f}-\frac{1}{u}$$ | | |
| | $$\frac{1}{v}=\frac{1}{10}-\frac{1}{-10}$$ | 1 | |
| | $$\frac{1}{v}=\frac{1}{10}+\frac{1}{10}$$ | | |
| | $$\frac{1}{v}=\frac{1}{5} \therefore v=5cm$$ | ½ | |
| | OR | | |

| | | |
|---|---|---|
| (a) | (i) Ability of a lens to converge or diverge light rays/reciprocal of focal length of lens. | 1 |
| | (ii) It is a point on principal axis at which light ray parallel to principal axis converges after reflection. | 1 |
| (b) | (i) for spherical lens : $\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$ | ½ |
| | (ii) for spherical mirror : $\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$ | ½ |
| (c) | | 2 |
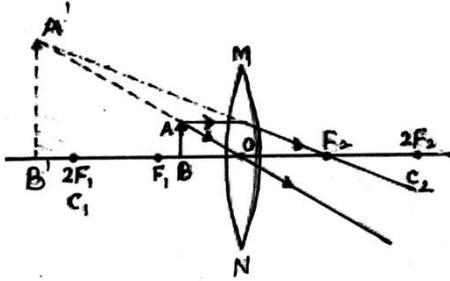


Distance of object (BO) = 10 cm
Focal length (OF$_1$) = 15 cm

5

(If the distance in the diagram are not marked , deduct ½ marks)

**30.**

(a) In this case : Length L becomes l/2 then Area of cross section A become 2A

$$R = \rho \frac{L}{A} = 6\Omega$$  ½

$$R' = \rho \frac{L/2}{2A}$$  ½

$$R' = \frac{1}{4} \rho \frac{L}{A}$$  ½
$$R' = \frac{1}{4} \times 6$$

$$R' = \frac{3}{2} \Omega$$  ½

(b) No of resistors = 3
Each resistor has resistance = 2Ω
In this arrangement where total resistance is 3Ω
- Resistor A of 2Ω is connected in series with a parallel combination of the resistors B (2Ω) and C (2Ω).  ½

- Arrangement :



1

- Total resistance (R) = $2\Omega + \frac{2\Omega \times 2\Omega}{2\Omega + 2\Omega}$

| | | R= 2Ω + $\frac{4Ω}{4Ω}$ <br><br> $R = 2Ω + 1Ω$ <br><br> R = 3Ω | ½ ×3 | 5 |