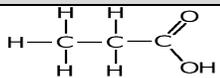


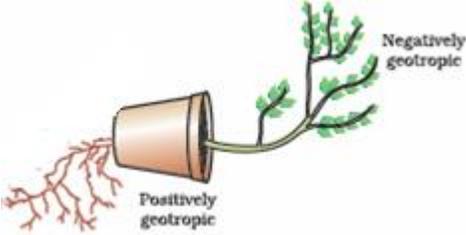
Strictly Confidential: (For Internal and Restricted use only)
Secondary School Examination-2020
Marking Scheme – SCIENCE
(SUBJECT CODE: 086) (PAPER CODE : 31/4/3)

General Instructions: -

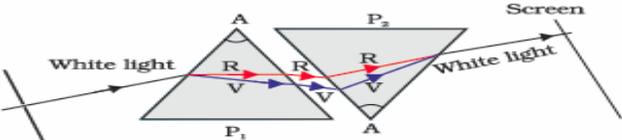
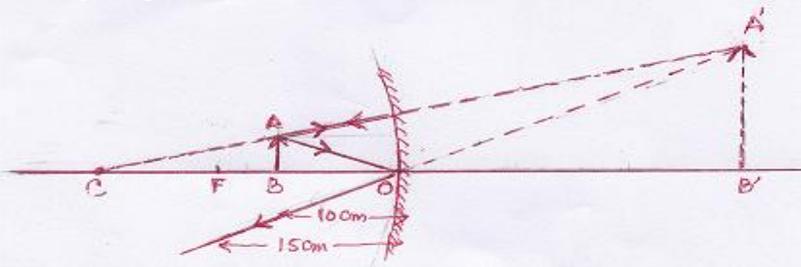
1. You are aware that evaluation is the most important process in the actual and correct assessment of the candidates. A small mistake in evaluation may lead to serious problems which may affect the future of the candidates, education system and teaching profession. To avoid mistakes, it is requested 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 efforts in 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(\checkmark) 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 **0-80** 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.

| MARKING SCHEME –CLASS X SCIENCE(2019-20) | | | |
|--|--|---|-------------|
| QUESTION PAPER CODE : SET 31/4/3 | | | |
| S.NO | VALUE POINTS/EXPECTED ANSWER | MARKS | TOTAL MARKS |
| SECTION A | | | |
| 1. | Propanoic acid  | 1 | 1 |
| 2 | When 1 joule of work is done to move a charge of 1 coulomb from one point to the other /1 volt = $\frac{1 \text{ joule}}{1 \text{ coulomb}}$ | 1 | 1 |
| 3. | (a) The properties of elements are the periodic functions of their atomic masses. (b) To fill with undiscovered elements. (c) (ii)/RH ₄ , RO ₂ (d) (i)/Atoms of an element with similar chemical properties but different atomic masses. | 1 1 1 1 | 4 |
| 4. | (a) Use of separate bins for plastic and paper ; separation of biodegradable and non biodegradable waste or any other. (b) <ul style="list-style-type: none"> • Packaging of articles like water, food, biscuits, milk etc • Disposable utility items – bowls, tumblers, plates, leaves etc. (c) By providing cloth /jute /earthen pots and utensils/ paper or any other material for the similar purposes. (d) <ul style="list-style-type: none"> • Yes • The action of microbes is tested in the laboratory creating the same conditions as in the landfill. | $\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$ 1 $\frac{1}{2}$ $\frac{1}{2}$ | 4 |
| 5. | Note: Treat all answers as correct. Give full credit even if not attempted. | 1 | 1 |
| 6. | (C) /various interlinked food chains in an ecosystem. | 1 | 1 |
| 7. | (C) /It detaches from the parent body as soon as it is produced. | 1 | 1 |
| 8. | (A)/ takes place in yeast during fermentation. OR (A)/ small intestine | 1 | 1 |
| 9. | (B) IR ² | 1 | 1 |
| 10. | (B)/ The nucleus of Uranium is bombarded with high energy neutrons. OR (A)/ Biomass | 1 | 1 |
| 11. | (C) / Valves ensure that the blood does not flow backwards. | 1 | 1 |
| 12. | (A) /1 Ω OR (B) / half | 1 1 | 1 |
| 13. | (a) /Both (A) and (R) are true and (R) is the correct explanation of the assertion (A). | 1 | 1 |
| 14. | (b) /Both (A) and (R) are true but (R) is not the correct explanation of the assertion (A). | 1 | 1 |

| SECTION B | | | |
|-----------|--|---|---|
| 15. | <p>The movement of the growth of the roots downwards and the shoots upwards under the stimuli of gravity is called geotropism./ The movement of the part of the plant towards or away from the stimulus gravity.</p>  <p style="text-align: right;">Diagram Labelling</p> | 1 1 ½+ ½ | 3 |
| 16. | <ul style="list-style-type: none"> A cheetah on seeing a prey generates a nerve impulse which reaches the muscles and the muscle fibre moves. <p>The muscle cell will then move by changing their shape so that muscle cells shorten.</p> <ul style="list-style-type: none"> Muscle cells have special proteins that change both shape and their arrangement in the cell in response to nervous electrical impulses. <p>When this happens new arrangements of these proteins give the muscle cells a shorter form.</p> | 1 ½ 1 ½ | 3 |
| 17. | <p>(a) Soap is sodium or potassium salt of long chain carboxylic acids while detergents are ammonium or sulphonate salts of long chain carboxylic acids.</p> <p>(b)</p> <ul style="list-style-type: none"> Take two test tubes with about 10 ml of hard water in each. Add five drops of soap solution to one and five drops of detergent solution to the other. Shake both test tubes for the same period. In detergent quantity of lather is more than soap. | ½ + ½ 2 | 3 |
| 18. | <p>(a) Lead iodide; Yellow colour</p> <p>(b) $Pb(NO_3)_2 + 2 KI \rightarrow PbI_2 + 2 KNO_3$</p> <p>Note : ½ marks to be deducted if reaction is not balanced.</p> <p>(c) Double displacement reaction ; Due to exchange of ions.</p> <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> Fats and oils become rancid. Observable changes – <ol style="list-style-type: none"> Change in taste Change in smell Three ways of prevention :- <ol style="list-style-type: none"> Addition of antioxidants / substance which prevent oxidation. Keeping food in air tight containers. Use of nitrogen gas in packaged food. | ½ + ½ 1 ½+½ ½ ½ ½ ½ ½ ½ | 3 |

| 19. | <table border="1"> <thead> <tr> <th>Galvanisation</th> <th>Alloying</th> </tr> </thead> <tbody> <tr> <td>1. Coating a layer of zinc metal on the metal.</td> <td>1. Mixing of a metal with metal or non-metal.</td> </tr> <tr> <td>2. Not a homogeneous mixture.</td> <td>2. Homogeneous mixture.</td> </tr> <tr> <td>3. No change in physical properties of metals takes place.</td> <td>3. Change in physical properties of metals takes place.</td> </tr> <tr> <td>4. The process is an outcome of the reactivity of metals.</td> <td>4. Reactivity of metals do not play any role in it.</td> </tr> <tr> <td>5. Prevents rusting only.</td> <td>5. Some alloys may prevent rusting and also used for other advantages.</td> </tr> </tbody> </table> | Galvanisation | Alloying | 1. Coating a layer of zinc metal on the metal. | 1. Mixing of a metal with metal or non-metal. | 2. Not a homogeneous mixture. | 2. Homogeneous mixture. | 3. No change in physical properties of metals takes place. | 3. Change in physical properties of metals takes place. | 4. The process is an outcome of the reactivity of metals. | 4. Reactivity of metals do not play any role in it. | 5. Prevents rusting only. | 5. Some alloys may prevent rusting and also used for other advantages. | 1×3 | 3 |
|--|--|--|----------------------|---|---|--|--|--|--|---|--|--|--|-----|---|
| | Galvanisation | Alloying | | | | | | | | | | | | | |
| 1. Coating a layer of zinc metal on the metal. | 1. Mixing of a metal with metal or non-metal. | | | | | | | | | | | | | | |
| 2. Not a homogeneous mixture. | 2. Homogeneous mixture. | | | | | | | | | | | | | | |
| 3. No change in physical properties of metals takes place. | 3. Change in physical properties of metals takes place. | | | | | | | | | | | | | | |
| 4. The process is an outcome of the reactivity of metals. | 4. Reactivity of metals do not play any role in it. | | | | | | | | | | | | | | |
| 5. Prevents rusting only. | 5. Some alloys may prevent rusting and also used for other advantages. | | | | | | | | | | | | | | |
| <p style="text-align: right;">(Any Three)</p> <p style="text-align: center;">OR</p> <table border="1"> <thead> <tr> <th></th> <th>Cold Water</th> <th>Hot Water</th> </tr> </thead> <tbody> <tr> <td>Sodium</td> <td> <ul style="list-style-type: none"> Reacts violently Heat is evolved. </td> <td> <ul style="list-style-type: none"> React more violently More heat is evolved. (Any one point) </td> </tr> <tr> <td>Calcium</td> <td> <ul style="list-style-type: none"> Reacts less violently as compared to sodium. </td> <td> <ul style="list-style-type: none"> Reacts violently with hot water and sticks to surface of metal and floats on surface of water. </td> </tr> <tr> <td>Magnesium</td> <td> <ul style="list-style-type: none"> Does not react with cold water </td> <td> <ul style="list-style-type: none"> React with hot water and floats on surface of water. </td> </tr> </tbody> </table> | | Cold Water | Hot Water | Sodium | <ul style="list-style-type: none"> Reacts violently Heat is evolved. | <ul style="list-style-type: none"> React more violently More heat is evolved. (Any one point) | Calcium | <ul style="list-style-type: none"> Reacts less violently as compared to sodium. | <ul style="list-style-type: none"> Reacts violently with hot water and sticks to surface of metal and floats on surface of water. | Magnesium | <ul style="list-style-type: none"> Does not react with cold water | <ul style="list-style-type: none"> React with hot water and floats on surface of water. | 1 × 3 | | |
| | Cold Water | Hot Water | | | | | | | | | | | | | |
| Sodium | <ul style="list-style-type: none"> Reacts violently Heat is evolved. | <ul style="list-style-type: none"> React more violently More heat is evolved. (Any one point) | | | | | | | | | | | | | |
| Calcium | <ul style="list-style-type: none"> Reacts less violently as compared to sodium. | <ul style="list-style-type: none"> Reacts violently with hot water and sticks to surface of metal and floats on surface of water. | | | | | | | | | | | | | |
| Magnesium | <ul style="list-style-type: none"> Does not react with cold water | <ul style="list-style-type: none"> React with hot water and floats on surface of water. | | | | | | | | | | | | | |
| 20. | <ul style="list-style-type: none"> Variation- The occurrence of structural and functional differences among the individuals of same species are called variations. Variations help in adaptations /survival/Organic evolution Error in DNA copying/ combining of DNA from parents /mutation. (Any two) <p style="text-align: center;">OR</p> <table border="1"> <thead> <tr> <th>Acquired Characters</th> <th>Inherited Characters</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> Character / Traits which an organisms acquired during its lifetime. </td> <td> <ul style="list-style-type: none"> Character / Traits which can pass from one generation to the next generation. </td> </tr> <tr> <td> <ul style="list-style-type: none"> Acquired characters / traits are in the somatic cells/ body cells/no change in DNA of cell. Do not play any role in evolution. Eg. Dancing skill </td> <td> <ul style="list-style-type: none"> Inherited characters / traits are in the DNA of the germ cells. Bring about evolution of species. (Any two) Eg. Colour of eye. </td> </tr> </tbody> </table> | Acquired Characters | Inherited Characters | <ul style="list-style-type: none"> Character / Traits which an organisms acquired during its lifetime. | <ul style="list-style-type: none"> Character / Traits which can pass from one generation to the next generation. | <ul style="list-style-type: none"> Acquired characters / traits are in the somatic cells/ body cells/no change in DNA of cell. Do not play any role in evolution. Eg. Dancing skill | <ul style="list-style-type: none"> Inherited characters / traits are in the DNA of the germ cells. Bring about evolution of species. (Any two) Eg. Colour of eye. | 1 1 1 | 3 | | | | | | |
| Acquired Characters | Inherited Characters | | | | | | | | | | | | | | |
| <ul style="list-style-type: none"> Character / Traits which an organisms acquired during its lifetime. | <ul style="list-style-type: none"> Character / Traits which can pass from one generation to the next generation. | | | | | | | | | | | | | | |
| <ul style="list-style-type: none"> Acquired characters / traits are in the somatic cells/ body cells/no change in DNA of cell. Do not play any role in evolution. Eg. Dancing skill | <ul style="list-style-type: none"> Inherited characters / traits are in the DNA of the germ cells. Bring about evolution of species. (Any two) Eg. Colour of eye. | | | | | | | | | | | | | | |
| | | 1 × 2 | 1 | | | | | | | | | | | | |

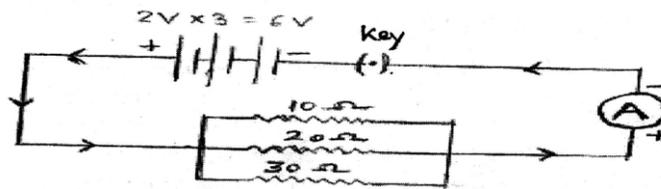
| | | | |
|------------------|---|---|---|
| 21. | <p>By placing second (identical) prism in an inverted position with respect to the first prism.</p>  <p style="text-align: right;">Diagram Labelling</p> | 1 | |
| 22. | <p>(a) Behind the mirror (b) Magnified (c) Virtual and erect</p> <p>Labelled ray diagram</p>  | <p>1 ½ ½ ½</p> <p style="text-align: right;">1½</p> | 3 |
| 23. | <p>Hypermetropia / When a person cannot see nearby objects clearly but can see distant objects clearly.</p> <ul style="list-style-type: none"> The focal length of the eye is too long. The eyeball has become too small. <p>Corrected by using convex lens or converging lens of appropriate power.</p> | <p>1 ½+½ 1</p> | 3 |
| 24. | <ul style="list-style-type: none"> $n_{xy} = \frac{2}{3} \quad \therefore \quad n_{yx} = \frac{3}{2}$ $n_{yz} = \frac{4}{3} \quad \therefore \quad n_{zy} = \frac{3}{4}$ $n_{zx} = n_{zy} \times n_{yx}$ $\therefore \quad n_{zx} = \frac{3}{4} \times \frac{3}{2} = \frac{9}{8}$ $n_{yx} = \frac{v_x}{v_y}$ $\frac{3}{2} = \frac{3 \times 10^8}{v_y}$ $v_y = \frac{3 \times 10^8 \times 2}{3} = 2 \times 10^8 \text{ m/s}$ | <p>½ ½ ½ ½ ½</p> | 3 |
| SECTION C | | | |
| 25. | <p>Olfactory indicator (a) Colourless and Odourless gas is evolved with bubbles .</p> | 1 1 | |

| | | | |
|-----|--|---|---|
| | <p style="text-align: center;">$\text{Zinc} + \text{Acid} \rightarrow \text{Zinc Salt} + \text{H}_2 \uparrow$ (or by using any example of acid e.g. HCl/ H₂SO₄)</p> <p>(b) Brisk effervescence/ colourless and odourless gas is evolved. Sodium carbonate + Acid \rightarrow Sodium salt of Acid + Water + Carbon dioxide \uparrow (or by using any example of acid like HCl/ H₂SO₄)</p> <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> Water of crystallization is the fixed number of water molecules present in one formula unit of a salt. Examples CuSO₄ .5H₂O Na₂CO₃.10 H₂O (or Any other) Heat a few crystals of hydrated copper sulphate(bluecolour) in a dry boiling tube. Water droplets are seen in the boiling tube. Colour : The colour of copper sulphate changes to white . State :The blue crystal changes to white powder. | 1 1 1 1 1/2 1/2 1/2 1 1 | 5 |
| 26. | <p>a)</p> <ul style="list-style-type: none"> Alloy – A homogeneous mixture of two or more metals or a metal and non-metal in definite proportion. Amalgam – If one of the constituents of an alloy is mercury. Solder ; Lead and tin. <p>b) (i) Copper and Zinc / Cu and Zn (ii) Iron, Nickel and Chromium / Fe , Ni , Cr (iii) Copper and Tin / Cu and Sn.</p> <ul style="list-style-type: none"> Brass and Bronze have lower electrical conductivity than their constituents. Stainless steel does not corrode easily as iron does. | 1/2 1/2 1/2 + 1/2 1/2 1/2 1/2 + 1/2 1/2 | 5 |
| 27. | <p>(a) Flemings’ Left hand rule: Stretch the thumb, forefinger and middle finger of your left hand such that they are mutually perpendicular. If the forefinger points in the direction of magnetic field, middle finger in the direction of current , then the thumb will point in the direction of motion or force acting on the conductor.</p> <p>(b) Three characteristic features :</p> <ul style="list-style-type: none"> Reverses direction periodically. Frequency of 50 Hz. Potential difference between live wire and neutral wire is about 220V. <p>(c)</p> <ul style="list-style-type: none"> Fuse is a safety device used in a circuit (or appliance) to prevent damage due to overloading/ short circuiting. It protects the circuit (or appliance) by stopping the flow of any unduly high electric current / If current larger than the specified value flows through the circuit , due to Joule’s heating effect the fuse wire melts and breaks the circuit. | 1 1/2 1/2 1/2 | |

| | | | |
|-----|---|---|----------------------------|
| | (d) It provides a low resistance conducting path for the current and protects the user from electric shock due to leakage of current. | 1 | 5 |
| 28. | <p>a)</p> <ul style="list-style-type: none"> • Uterus prepare itself with the development of a thick lining which is richly supplied with blood to nourish the growing embryo. • The embryo gets nutrition from mother's blood with the help of a special tissue called placenta. • Disc like structure in the uterine wall contain villi on the embryo's side of the tissue and blood spaces/ capillaries from mother's sides. • It passes glucose and oxygen from mother to the embryo and waste substances from embryo to the mother. • The child gets developed inside the mother's body in ninemonths and is born as a result of rhythmic contractions of the muscles in the uterus. <p>b) The thick and spongy lining of the uterus break and comes out through vagina as blood and mucous ie menstruation occurs.</p> <p style="text-align: center;">OR</p> <p>a)</p> <ul style="list-style-type: none"> • It is a method of reproduction in which a new plant develops from the vegetative parts of plants like root, stem or leaf. • Advantages :- <ul style="list-style-type: none"> - Bear flowers and fruits earlier - Many identical plants having same characters can be raised - Only means of propagation in plants which have lost the capacity to produce seed. • Methods :- Layering / Grafting / Cutting (Any Two) <p>a) In complex organisms there is high level of differentiation and organization. Hence tissue/organ lose the ability to regenerate. Cells make up tissues –organ –organ system and are placed at definite positions in the body.</p> <p>So, they cannot give rise to new individuals from their cut body parts by regeneration.</p> | <p>1/2 1/2</p> <p>1/2</p> <p>1/2</p> <p>1/2 1/2 1/2 1/2</p> <p>1</p> <p>1</p> <p>1/2 × 3 1/2 + 1/2</p> <p>1/2 1/2 1/2</p> | <p>5</p> <p>5</p> <p>5</p> |
| 29. | <p>(a) For providing energy for various metabolic processes / Formation of new cells / Repair of damaged or worn out cells & tissues / Developing resistance against diseases. (Any Two)</p> <p>(b) Peristaltic movement / Peristalsis/ Rhythmic contraction and relaxation of the muscles in the lining of alimentary canal.</p> <p>(c) Herbivores eat plant matter which is rich in cellulose and takes longer time to digest and hence longer small intestine.</p> <p>(d) The inner lining of the stomach will not be protected from the action of the acid /HCl</p> | <p>1+1</p> <p>1</p> <p>1</p> <p>1</p> | <p>5</p> |

30.

(a)



Three resistors are connected in parallel hence voltage across each is same i.e. 6V.

$$I_1 = \frac{V}{R_1} = \frac{6}{10} = 0.6 \text{ A}$$

$$I_2 = \frac{V}{R_2} = \frac{6}{20} = 0.3 \text{ A}$$

$$I_3 = \frac{V}{R_3} = \frac{6}{30} = 0.2 \text{ A}$$

$$\text{b) } I = I_1 + I_2 + I_3 = 1.1 \text{ A}$$

$$\text{c) } R_{\text{eff}} = \frac{V}{I}$$

$$= \frac{6}{1.1} = 5.4\Omega$$

OR

$$R_1 = R_2 = 15\Omega \quad V = 6V$$

i) In series :

$$R_s = R_1 + R_2 = 15\Omega + 15\Omega = 30\Omega$$

$$I = \frac{V}{R_s} = \frac{6V}{30\Omega} = 0.2 \text{ A}$$

$$\therefore P_1 = VI = 6V \times 0.2 \text{ A} = 1.2 \text{ W}$$

ii) In parallel

$$R_p = \frac{R_1 \times R_2}{R_1 + R_2} = \frac{15 \times 15}{15 + 15} = \frac{225}{30} = 7.5\Omega$$

$$I = \frac{V}{R_p} = \frac{6V}{7.5\Omega} = 0.8 \text{ A}$$

$$P_2 = VI = 6V \times 0.8 \text{ A} = 4.8 \text{ W}$$

$$\text{Ratio of power} = \frac{P_1}{P_2} = \frac{1.2 \text{ W}}{4.8 \text{ W}} = \frac{1}{4}$$

$$\therefore P_1 : P_2 = 1 : 4$$

2

 $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$

1

 $\frac{1}{2}$ $\frac{1}{2}$

1

 $\frac{1}{2}$ $\frac{1}{2}$

5