केंद्रीय विद्यालय संगठन
KENDRIYA VIDYALAYA SANGATHAN

शिक्षा एवं प्रशिक्षण का आंचलिक संस्थान, चंडीगढ़

ZONAL INSTITUTE OF EDUCATION AND TRAINING, CHANDIGARH

SAMPLE PAPERS

SESSION– 2021-22

CLASS – X
SCIENCE
TERM - II

KVS Zonal Institute of Education & Training Chandigarh

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DIRECTOR'S MESSAGE

Our aim is to provide such brief study materials and sample papers to the student that not only guides students to the path of success, but also inspires them to recognize and explore their own inner potential. The Board exam preparation is based on three pillars – **Concept Clarity, Contextual familiarity and Application Expertise**. Our innovative and dedicated teaching materials ensure that every student gets a firm grip of each of these pillars so very essential for these arduous preparations.

We also understand the importance of CBSE board exam as students' future goal depends upon the performance in board exams. We know that in pandemic situation the students feel a lot of pressure of performance in board exam. It is very important to develop the right exam temperament in students so they can tackle the pressure & surprises easily. In this direction, to release such brief study materials and sample papers will help to the students a lot.

CLASS - X
SCIENCE
COURSE STRUCTURE
EVALUATION SCHEME THEORY TERM - II

UNITS	TERM II	MARKS
I	Chemical Substances-Nature and Behaviour: Chapter 4 and 5	10
II	World of Living: Chapter 8 and 9	13
III	Effects of Current: Chapter 12 and 13	12
IV	Natural Resources: Chapter 15	05
	TOTAL	40

CLASS-X
SCIENCE
SAMPLE PAPER TERM - II
BLUE PRINT

S. NO.	UNITS	SECTION -A (2 MARKS)	SECTION-B (3 MARKS)	SECTION-C CASE BASED (5 MARKS)	TOTAL
1.	Carbon & its compounds	1 (2)	1 (3)		2 (5)
2.	Periodic classification of elements	1 (2)	1 (3)		2 (5)
3.	How do organisms reproduce?	1(2)	1 (3)	1 (4)	3 (9)
4.	Heredity & evolution	2 (2)			2 (4)
5.	Electricity		2 (3)		2 (6)
6.	Magnetic effects of current	1 (2)		1 (4)	2 (6)
7.	Natural environment	1 (2)	1 (3)		2 (5)
	Total questions	7 (14)	6 (18)	2 (8)	15 (40)

CLASS - X
SCIENCE THEORY
TERM - II (2021-22)
SAMPLE PAPER -1

MM: 40   **TIME: 2 HOURS**
GENERAL INSTRUCTIONS:
Read the following instructions carefully.
1. There are 15 questions in this question paper with internal choice.
2. SECTION – A, Q. No. 1 – 7 are very short answer questions carrying 2 Marks each.
3. SECTION – B, Q. No. 8 – 13 are short answer questions carrying 3 Marks each.
4. SECTION – C. Q. No. 14 & 15are case based question carrying 4 Marks each.
5. All questions are compulsory.
6. Use of log tables and Calculator is not allowed.

SECTION – A

Q1. Write the name and structure of a saturated compound in which three carbon atoms are arranged in a ring. Give the number of single bonds present in this compound.
Q2. The electronic configuration of an element is 2, 8, 4. State its:
    a. Group and period in the Modern periodic table.
    b. Name and write its one physical property.
Q3. Differentiate between self-pollination and cross pollination.
Q4. In the field of genetics:
    a. Define the word inheritance.
    b. Give two differences between somatic and germinal variations.
Q5. The process of reproduction is broadly classified into two categories. Name the two types of reproduction. Mention one basic difference between them. Which one of the two, is responsible for bringing in variations in the next generation?
Q6. A wire is placed between N and S poles of a magnet as shown in figure. If current flows in the wire as shown, in which direction does the wire tend to move?
Q7. Suggest one word for each of the following statements:
    a. An integrated network of physical and biological world where we live in.
    b. The different levels of food chain involving transfer of matter and energy.
    c. The parameters like temperature, rainfall, wind and soil of a habitat.
    d. Organisms which depend on the producers either directly or indirectly for food.
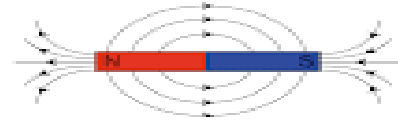
SECTION – B

Q8. Based on the inherent property of formation of compounds, answer the following:
    a. Carbon, Group (14) element in the periodic table, is known to form compounds with many elements. Write an example of a compound formed with:
     i. Oxygen, (Group 16 element in the periodic table).
    ii. Chlorine, (Group 17 element in the periodic table).
    b. Why covalent compounds have low melting and boiling points.
Q9. From the elements A (At. No. 19, Mass no. 39), B (At. No. 14, Mass no. 28), C (At. No. 8, Mass no. 16), D (At. No. 18, Mass no. 40) Identify:
    i. The most electropositive element.
    ii. A noble gas.

  iii. A metalloid.

  iv. An element which will gain 2 electrons to attain nearest noble gas configuration.

  v. Formula of compound formed between A and C.

  vi. Element belonging to same period.

Q10. 'Reproduction is one of the most important characteristics of living beings'. Give three reasons in support of the given statement.

Q11. (i) Write the relation between resistance and electrical resistivity of the material of a conductor in the shape of a cylinder of length 'l' and area of cross-section 'A'. Hence derive the S.I. unit of electrical resistivity.

 (ii) Resistance of a metal wire of length 5 m is 100 ohms. If the area of cross-section of the wire is 3×10^{-7} m^2, calculate the resistivity of the metal.

Q12. A torch bulb is rated 5 V and 500 mA. Calculate its

  a. Power

  b. Resistance

  c. Energy consumed when it is lighted for 2.5 hours

Q13. Food chain and food web forms the basis of ecosystems. Based on it comment on:

  a. What are decomposers. Give two examples of decomposers.

  b. What will be the consequence of their absence in an ecosystem?

SECTION – C

Q14. Acquired Immunodeficiency Syndrome (AIDS) is a chronic life-threatening disorder. It is one of the sexually transmitted disease and is caused by a virus called HIV (Human Immunodeficiency Virus). HIV damages the immune system of the body so that the body cannot protect itself against infection. So, HIV-AIDS is a very dangerous which leads to death.

Some of the symptoms of AIDS are weight loss, fever, diarrhoea, oral thrush and enlargement of lymph glands. In severe conditions, a patient may develop pneumonia, cancer of skin and lymph system. The life span of the patient may be restricted from a year to sometimes twenty years.

The virus may gain entry by many routes, some of which are blood transfusion, hypodermic needles used by addicts, homosexual or heterosexual intercourse with the infected partner.

Treatment: No definite cure has been found for the HIV-AIDS so far. The best method of prevention is to avoid drug abuse and intercourse with affected persons and restrict mating to one partner only.

Based on above information, answer the following questions:

(i) What are sexually transmitted diseases?

(ii) Contraceptive methods can be used to prevent STDs. Name any two.

(iii) What is the difference between HIV and AIDS?

(iv) How can people be made aware of STDs?

Q15. When the magnet is brought into the field of another magnet, the field interacts with each pole of the magnet and each of these poles experience magnetic force.

The space surrounding a magnet where a magnetic force is experienced is called magnetic field.

A magnetic field line is a continuous curve in a magnetic field such that the tangent at any point on it gives the direction of magnetic field at that point.

Based on above information, answer the following questions:

(i)   Where is the magnetism minimum in a bar magnet?
(ii)   Meena draws magnetic field lines of field close to the axis of a current-carrying circular loop. As she moves away from the centre of the circular loop, she observes that the lines keep on diverging. How will you explain her observation?
(iii)   How can it be proved that a magnetic field exists around a current carrying metallic wire?
(iv)   What are uniform and non-uniform magnetic fields?

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CLASS-X
SCIENCE
SAMPLE PAPER TERM - II
BLUE PRINT

S. NO.	UNITS	SECTION-A 2 MARKS	SECTION-B 3 MARKS	SECTION-C CASE BASED 5 MARKS	TOTAL
1.	Carbon & its compounds	1 (2)	1 (3)		2 (5)
2.	Periodic classification of elements	1 (2)	1 (3)		2 (5)
3.	How do organisms reproduce?	2 (2)	1 (3)		3 (7)
4.	Heredity & evolution	1 (2)		1 (4)	2 (6)
5.	Electricity	1 (2)		1 (4)	2 (6)
6.	Magnetic effects of current		2 (3)		2 (6)
7.	Natural environment	1 (2)	1 (3)		2 (5)
	Total questions	7 (14)	6 (18)	2 (8)	15 (40)

CLASS - X
SCIENCE THEORY
TERM - II (2021-22)
SAMPLE PAPER -2

MM: 40   **TIME: 2 HOURS**
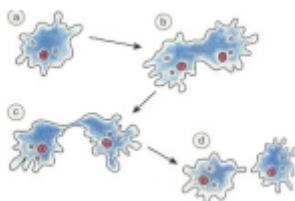
GENERAL INSTRUCTIONS:
Read the following instructions carefully.
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3. SECTION – B, Q. No. 8 – 13 are short answer questions carrying 3 Marks each.
4. SECTION – C. Q. No. 14 & 15are case based question carrying 4 Marks each.
5. All questions are compulsory.
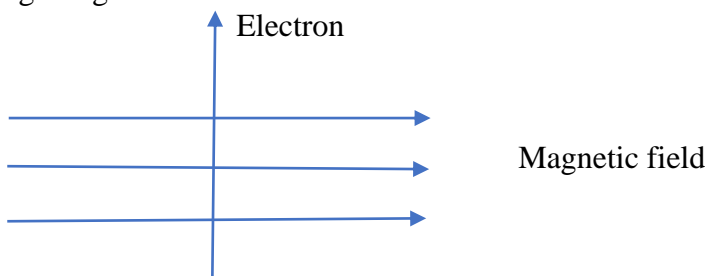6. Use of log tables and Calculator is not allowed.

SECTION – A
Q1. Define isomerism. Draw all possible isomers of butane.
Q2. An element 'X' has mass number 35 and number of neutrons 18. Write atomic number and electronic configuration of 'X'. Also write name and valency of 'X'.
Q3. Identify the organism in the given figure and write two important observations.

Q4. Vegetative propagation is quick and suitable method for multiplication of horticultural crops. Comment on the statement.

Q5. A wire of length l and resistance R is stretched so that its length is doubled and the area of cross-section is halved. How will its resistance change? Justify your answer in this case.

Q6. In the experiments conducted by Mendel, taking height as one characters, mention:
   a. At what stage the law of dominance can be observed?
   b. At what stage law of segregation is depicted and with what percentage of expression?

Q7. Give two differences between food chain and food web.

SECTION – B

Q8. Draw the electron dot structures of
   a. Ethane (C_2H_6)
   b. Ethene (C_2H_4)
   c. Ethyne (C_2H_2)

Q9. An element placed in 2nd group and 3rd period of the periodic table, burns in the presence of oxygen to form a basic oxide.
   a. Identify the element and write their electronic configuration.
   b. Write a balance equation when this oxide is dissolved in water.
   c. Draw the electron dot structure for the formation of this oxide.

Q10. Reproduction involves a set of organs to function properly.
   a. Name the primary reproductive organ in the human female reproductive system.
   b. What role does the secondary organs play during the reproductive cycle of human female?

Q11. In experiments with magnets:
   a. Draw the pattern of magnetic field lines due to a magnetic field through and around a current carrying circular loop.
   b. Name and state the rule to find out the direction of magnetic field inside and around the loop.

Q12. In the diagram given below:

   (i)   State Fleming's left-hand rule.
   (ii) An electron moves perpendicular to a magnetic field as shown in above figure. What would be the direction of force experienced by the electrons?

Q13. Environment protection is of prime concern these days:
   a. Differentiate between biodegradable and non-biodegradable substances with the help of one example each.
   b. List two changes in the habitat that people must adopt to dispose non-biodegradable wastes for saving the environment?

SECTION – C

Q14. Mendel is credited with the honour of being the first person to use logical and mathematical approach to study transmission of traits from parents to next generation. He used garden pea plant to do his experiments. During his studies, he noticed some characters which were easy to identify and existed in opposite pairs. The procedure followed by him involved transmission of a single trait and also two different traits together. In his experiments with pea plant involving two characters of seed shape (round or wrinkled) and seed colour (yellow or green), his observations led him to materialize the famous laws of inheritance. The ratios that he observed are valid till today.

      a. What is the name of the cross that is mentioned in the above paragraph?

      b. Make a cross using the data given, taking parents to be pure for both traits together and find out the expression of F1 generation?

      c. Taking the F1 combination, make a cross (undergoing selfing), and find out the possibilities of different combinations in the F2 generation?

Q15. In many electric appliances, such as radio, television and other similar things, it is necessary to combine two or more resistance to get the required current flowing through the circuit . So, there are two types of combination of resistance such as:

a. Resistance in series: In this combination of resistance, current flowing through all resistors is same but voltage across them is different. i.e., $R_{eq} = R_1 + R_2$

b. Resistance in parallel: In this combination of resistance, current flowing through all resistors is different but voltage across them is same. i.e., $1/R_{eq} = 1/R_1 + 1/R_2$

Based on above information, answer the following questions:

(i) Why is an ammeter likely to be burn out if it is connected in parallel in a circuit?

(ii) In series combination of resistance 4Ω and 3Ω, what will be the equivalent resistance?

(iii) In parallel combination of resistance 4Ω and 6Ω, what will be the equivalent resistance?

(iv) Why is resistance less when resistors are joined in parallel?

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CLASS - X
SCIENCE THEORY
TERM - II (2021-22)
BLUE PRINT
SAMPLE PAPER -3

S. NO.	UNITS	SECTION-A 2 MARKS	SECTION-B 3 MARKS	SECTION-C CASE BASED 5 MARKS	TOTAL
1.	Carbon & its compounds	1 (2)	1 (3)		2 (5)
2.	Periodic classification of elements	1 (2)	1 (3)		2 (5)
3.	How do organisms reproduce?	1(2)	1 (3)	1 (4)	3 (9)
4.	Heredity & evolution	2 (2)			2 (4)
5.	Electricity		2 (3)		2 (6)
6.	Magnetic effects of current	1 (2)		1 (4)	2 (6)
7.	Natural environment	1 (2)	1 (3)		2 (5)
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CLASS - X
SCIENCE THEORY
TERM - II (2021-22)
SAMPLE PAPER -3

MM: 40   **TIME: 2 HOURS**

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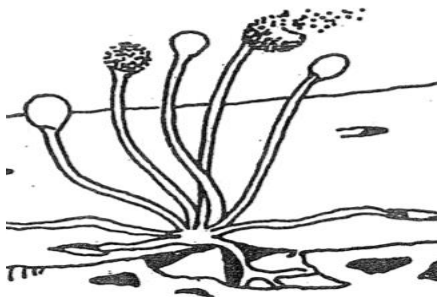
SECTION – A

Q1. Identify and name the functional groups present in the following compounds.

    a. $CH_3-CH_2-CH_2-OH$

    b. $CH_3-CH_2-CH_2-CHO$

    c. $CH_3-CH_2-CO-CH_2-CH_3$

    d. $CH_3- CH_2 –COOH$

Q2. A metal 'M' belongs to 13th group and 3rd period in the Modern periodic table.

    a. Write the valency of the metal 'M'.

    b. How does valency of an element vary across the period?

Q3. In the figure given below, identify the life form and comment on it.

Q4. A cross between two tall pea plant, produces tall and short both expressions. Make a cross based on the above information to explain the reason for the above observation.

Q5. How is sex determined in humans during reproduction?

Q6. A fixed wire AB carries current I. An electron is moving parallel to the wire, in which direction does the electron tend to move?

A ——————————————————B

Electron

Q7. Ecosystem is an integrated network of many components with each having its specific place and importance.
   a. List the two main components of an ecosystem.
   b. List two biotic components of a biosphere.

SECTION – B

Q8. (a) Write any two similarities and difference between cyclohexane and benzene. Also draw their structures.

(b) Write any two uses each of graphite and diamond.

Q9. An element X (Atomic number 17) reacts with an element Y (Atomic number 20) to form a divalent halide.
   a. Where in the periodic table are elements X and Y placed?
   b. Classify X and Y as metal, non-metal or metalloid.
   c. What will be the nature of oxide of element Y? Identify the nature of bonding in the compound formed.

Q10. During human reproductive cycle, what changes are observed if:
   a. The egg gets fertilized?
   b. The egg does not gets fertilized?

Q11. (a) Define electric power. Derive an expression for power in terms of current and
   (b) Two electric bulbs rated 100 W; 220 V and 60 W; 220 V are connected in parallel to an electric main of 220 V. Find the current drawn by bulbs from the mains.

Q12. Two identical resistors, each of resistance 15Ω are connected in (i) series and (ii) parallel, in turns to a battery of 6 V. Calculate the ratio of the power consumed in the combination of resistors in each case.

Q13. Explain the following:
   a. Autotrophs are at the first level of food chain. Give reason.
   b. How agricultural practices may cause damage to the environment?
   c. Construct a terrestrial food chain comprising four trophic levels.

SECTION – C

Q14. Evolutionary relationships of animals can be deduced by studying the design and function of organs of different animals / plants. If we compare the higher animals (vertebrates), we come across two types of situations. Some of the organs among the higher animals although look differently and perform different functions but to our surprise such organs show striking similarity in their internal structure and origin. While in some other cases, the organs look very similar and perform same function, but they show marked differences in their internal structure and origin. Similar examples can be cited in plants.
   a. What is this topic all about?
   b. Name the first category of organs discussed above. Give one example each from plant and animal group.
   c. Name the second category of organs discussed above. Give one example each from plant and animal group.

Q15. Faraday's discovery of electromagnetic induction in August 1831 has been recognized as one of his great achievements, as well as a discovery of immense importance in understanding electromagnetism. John Tyndall, one of the Faraday's early biographers surmised that this discovery of magneto-electricity is the greatest experimental result ever obtained by an investigator. It is the Mont Blanc of Faraday's own achievements. Thomas Martin, the editor of Faraday's laboratory notes, remarked that Faraday's discovery of induction, was one of the most important experiments in the history of physical science. The phenomenon Faraday had demonstrated was the generation of an electric current (electricity in motion), in a wire forming closed circuit, by the change of the current in an adjacent wire, as well as. by the wire either being in the presence of a changing magnetic force or moving through a region of magnetic force. The effect provided the anticipated converse of Oersted's demonstration in 1820, that an electric current produced a magnetic force. The importance of the phenomenon in the development of electromagnetism may be seen in the pivotal role it played in Maxwell's dynamical approach to electromagnetism.

Based on above information, answer the following questions:
   a. Write any one method to induce current in a coil.
   b. What is meant by electromagnetic induction?
   c. List the factors on which the value of induced current produced depends.
   d. What is the importance of the phenomenon 'electromagnetism'?

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CLASS - X
SCIENCE THEORY
TERM - II (2021-22)
Marking Scheme-SQP-1

Q1	Cyclopropane, No. of single bond = 9	1,1
Q2	(i)Group -14, Period – 3 (ii) Silicon, Non-metallic/poor conductor of electricity.	1,1
Q3	Self Pollination: Pollination occours from anthers to stigma of same flower Cross Pollination: Pollination occours from anthers to stigma of different flower on the same / different plant.	1+1
Q4	a. Inheritance: The process of transmission of traits/ characters from parents to next generation. b. Somatic variations may occour in general body cells but germinal variations occour only in gamete forming cells Somatic variations are non-inheritable but germinal variations are inheritable.	1+1
Q5	a. Vegetative and Sexual reproduction b. Vegetative: Multiplication from any part of the body except gametes, Sexual: Multiplication from any part of the body except gametes, c. Sexual reproduction shows variations.	½, 1, ½
Q6	The direction of magnetic field is from N-pole to S-pole; On applying Fleming's left-hand rule, the wire tends to move perpendicular to plane of paper in the upward direction.	1,1
Q7	a. Ecosystem b. Trophic level c. Physical /Abiotic factors d. Consumenrs (Heterotrophs)	½ X 4 = 2
Q8	(a) (i) carbon dioxide (CO_2) (ii) carbon tetrachloride (CCl_4) (b) Covalent compounds have low melting and boiling points because they have weak intermolecular forces of attraction.	2,1
Q9	(i) A, (ii) D, (iii) B, (iv) C, (v) A_2C (vi) B & D	½ X 6 =3
Q10	a. Continuity of species b. Bringing in variations due to recombination and random fertilization. c. Variations become the base for evolution.	1,1,1
Q11	(i) resistivity (ρ) = RA/l Units of resistivity = ohm metre (ii) ρ = RA/l =(100 x 3 x10^{-7}) /5 = 6 x 10^{-6}ohm metre	2,1
Q12	(i) P = VI = 5V X 500 m A = 2.5 watt (ii) P = V^2/R R = V^2/P = 5 x 5/2.5 = 25/2.5 = 10 ohm. (iii) Energy consumed = Power x Time = 2.5watt x 2.5hour = 6.25watt h	1,1,1

Q13	a. Decomposer: The organisms that consume dead or decaying organic matter for survival. e.g.: Fungus – Rhizopus, Bacteria for sewage treatment b. In the absence of decomposer the nature will not be cleaned and everywhere we will see dead organic matter.	1½, 1½
Q14	a. STD: The infections that can be transmitted by sexual contact with the infected person are sexually transmitted diseases. b. Contraceptive: Condom (male), Condom (female) c. HIV : Human Immuno Virus (Just the presence of virus in the body) AIDS: Acquired Immuno Deficiency Syndrome (Manifestation of symptoms) d. Awareness: Use of media (advertisement/documentary/skits Awareness programs for students (Content in book / Skits / AEP)	1,1,1,1
Q15	(i) Inside the magnet, magnetic field strength is decreasing. So, at the centre of the bar magnet, the magnetism is minimum. (ii) Strength of the magnetic field falls as distance increases. This is indicated by the decrease in degree of closeness of the lines of field. (iii) When a magnetic compass needle is placed close to the current carrying wire, it will get deflected. (iv) If the magnetic field lines are parallel and equidistant, the field is uniform and if they are irregularly spaced, the field is non-uniform.	1X4=4

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CLASS - X
SCIENCE THEORY
TERM - II (2021-22)
Marking Scheme-SQP-2

Q1	When two or more organic compounds have same molecular formula but different structural formula, then the compounds are called isomers and this phenomenon is called isomerism. ButaneCH_3-CH_2-CH_2-CH_3 Isobutane CH_3-$CH(CH_3)_2$	1,1
Q2	Atomic number = 17 Electronic configuration= 2, 8, 7 Group number = 17 Period number = 3 Valency of X = 1	2
Q3	Amoeba Binary Fission, Division of cytoplasm , nuclear division	½ X 4 = 2
Q4	Vegetative propagation: Any part of the plant that is used to multiply the parent plant. Since, parent plant is being used so no variation. The buds grow quickly Disease free parts used for multiplication reduce the use of insecticides.	1+1
Q5	R = ρ (l/A) New resistance, R_1 = ρ (2l/A/2)= 4ρ (l/A) = 4 x R i.e. Resistance becomes four times.	2
Q6	a. Law of dominance is seen during F1 b. Law of segregation is seen during F2 & to the extent of 25%	1+1
Q7	a. Food chain represent a single sequence of food/energy transfer. Food web represents multiple sequences of food chain b. Food chain is ecologically less stable than food web.	1+1
Q8	Draw the electron dot structures of Ethane (C_2H_6), Ethene (C_2H_4) and Ethyne (C_2H_2)	1,1,1
Q9	(i) Magnesium (Mg), Electronic configuration = 2, 8, 2 (ii) MgO (s) + H_2O(l) → 2Mg$(OH)_2$ (aq) (iii) Draw the electron dot structure of $Mg^{2+}[:O:]^{2-}$	1,1,1
Q10	a. Primary reproductive organs of human female: Ovaries b. Role of 2^0 reproductive organs: Tubes to transport gamete / zygote to the right place for implantation.	1,2
Q11	(i) Draw the pattern of magnetic field lines (ii)Right hand thumb rule, when a current straight conductor is held in the right hand in such a way that the thumb points towards the direction of the current, then the fingers will wrap around the conductor in the direction of the field lines of the magnetic field.	1,2
Q12	(i) Stretch the thumb, forefinger and middle finger of the left hand such that they are mutually perpendicular to one another. If the forefinger points in the direction of magnetic field and the middle finger in the direction of current, then the thumb will point in the direction of motion or the force acting on the conductor.	1½ , 1½

	(ii) According to Fleming's left-hand rule, the direction of force is perpendicular to the direction of magnetic field and current. We know that the direction of current is taken opposite to the direction of motion of electrons. Therefore, the force is directed upwards from the plane of the paper.	
Q13	a. Bio-degradable substances are organic substances that can be decomposed by living organisms (Microbes) where as non-bio-de e.g.: Fungus – Rhizopus, Bacteria for sewage treatment b. Habits to be adopted to reduce non-bio-degradable wastes: Reduce, Reuse, Recycle, Alternative products etc.	1½ , 1½

Q14	a. Di-hybrid cross
	b. Parents: RRYY X rryy = RrYy (F1)
	c. F1 : RrYy X RrYy
	F2: 25% = Double dominant: RRYY/RrYY/RrYy/RRYy
	    25% = 1st Domi. & 2nd Rece. : RRyy/Rryy
	    25% = 1st Rece. & 2nd Domi. : rrYY/rrYy
	    25% = Double recessive: rryy
		1,1,2

Q15	(i) The resistance of an ammeter is very low. If an ammeter is connected in parallel, the resultant resistance of the circuit decreases and excessive current passes through the instrument. Hence, the ammeter is likely to be burnt out. (ii) In series combination, $R = R_1 + R_2 = 4 + 3 = 7$ ohm (iii) In parallel combination, $1/R = 1/R_1 + 1/R_2 = 1/4 + 1/6 = 12/5 = 2.4$ ohm (iv) We know that when resistance is connected in parallel, the current is divided in different branches to go from one point to another across the applied potential difference. The equivalent resistance is reciprocal of sum of reciprocal of individual resistances. Hence, the equivalent resistance is less when resistors are connected in parallel.	1X4=4

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Q1	(i) -OH, Hydroxyl/Alcohol (ii) -CHO, Aldehyde (iii) >C = O, Ketone (iv) -COOH, Carboxylic acid	½ X 4 = 2
Q2	(i) Atomic number = 13 Electronic configuration = 2, 8, 3 Valency = 3 (ii) The valency of an element first increases the decreases across the period.	1,1
Q3	Rhizopus Process of spore formation (Sporulation)	1,1
Q4	Cross with parents heterozygous Tall (Tt), Getting the ration of Short (tt) Since, parent plant is (Tt) so gamete formation will result in segregation of (t) and fertilization will result the combining of (t) with (t) to form (tt) in the ration of 25%.	1+1
Q5	a. In humans sex is determined by the type of make gamete (sperm) that fertilizes the egg (X) b. If (X) containing sperm fertilizes the egg (X) : Girl child c. If (Y) containing sperm fertilizes the egg (X) : Boy child	1, 1,1
Q6	By right hand thumb rule, the magnetic field in the vicinity of wire is downward perpendicular to plane of paper. By convention, direction of electric current is opposite to the direction of motion of electron. By Fleming's left-hand rule, the force on electron is away from wire into the plane of paper; therefore, the electron will be deflected down ward (away from wire) into the plane of paper.	1+1
Q7	a. Biotic and Abiotic components of the ecosystem. b. Plants & Animals	1+1

Q8	a. Similarities: (i) Both are cyclic compounds (ii) Both contains 6 carbon atoms.
	    Differences: (i) Cyclohexane is a saturated compound whereas benzene is an unsaturated compound.
	      (ii) Cyclohexane is less reactive than benzene as double bond is weaker than single bond.
	    Draw their structures of benzene (C_6H_6) and Cyclohexane (C_6H_{12})
	b. Graphite: (i) It is used for making pencil. (ii) It is used as a lubricant.
	Diamond: (i) It is used in making tools. (ii) It is used in jewellery.
		1,1,1

Q9	a. X belongs to group 17 and 3rd period, Y belongs to group 2 and 4th period. b. X-Non-metal and Y-Metal c. Basic oxide, Ionic bonding	1,1,1
Q10	a. If egg gets fertilized: The zygote starts its journey in the fallopian tube towards uterus by repeated division (embryo). Uterus become	1,2

	more nutritive & spongy to receive the embryo. b. If egg is not fertilized: The egg remains alive for few hours before death. The nutritive & spongy layer of uterus is not required so it dislodges and starts being ejected out of uterus (menstruation). It may take 2 to 4 days for this.	
Q11	a. It is the rate at which electrical energy is dissipated or consumed in an electrical circuit is called electric power. $V = W/Q$, $W = VQ$, $W/t = V(Q/t)$ $P = VI = IR$. $I = I^2R$ b. Bulb 1: $I = P/V = 100/220 = 5/11 = I_1$ Bulb 2: $I = P/V = 60/220 = 3/11 = I_2$ Total current = $5/11 + 3/11 = 8/11 = 0.72$ A	1,2
Q12	$R_1 = R_2 = 15$ ohm = 6 V (i) In series: $R_s = R_1 + R_2 = 30$ ohm, $I = V/R_s = 6/30 = 0.2$ A $P_1 = VI = 6 \times 0.2 = 1.2$ W (ii) In parallel: $R_p = R_1 \times R_2/R_1 + R_2 = 225/30 = 7.5$ ohm $I = V/R_p = 6/7.5 = 0.8$ A $P_2 = VI = 6 \times 0.8 = 4.8$ W Ratio of power = $P_1/P_2 = 1.2/4.8 = 1/4$ $P_1 : P_2 = 1 : 4$	2,2
Q13	a. Autotrophs form the 1st trophic level because they are the initial providers of energy in the living system. b. Agriculture practices that damage ecosystem: Use of pesticides, excessive fertilizers, excessive use of ground water for irrigation. c. Grass → Insect → Frog → Snake / Eagle (or any other)	1,1,2
Q14	a. Evolutionary evidences b. Homologous organs. Animals: Human arm : Leg of horse : Flipper of whale Plants: Normal root : Root or carrot c. Analogous organs. Animals: Wing of bird : Wing of Insect Plants: Rose leaf : Tendril of pea plant	1,1,2
Q15	(i) By moving a magnet towards the coil or vice versa. Current can be induced in the coil. (ii) Electromagnetic induction is the phenomenon of production of emf (potential difference) or current in a coil due to change in magnetic field around it. (iii) The value of induced current produced in a circuit depends on the following factors: (a) number of turns in given coil (b) area of each turn in coil (c) rate of change of magnetic field.	1,1,2

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