

Strictly Confidential: (For Internal and Restricted use only)
Class : X Secondary School Term II Examination, 2022
Marking Scheme – Science SUBJECT CODE -086
(PAPER CODE –31/3/1)

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9. No marks to be deducted for the cumulative effect of an error. It should be penalized only once.
10. A full scale of marks **40** has to be used. Please do not hesitate to award full marks if the answer deserves it.
11. Every examiner has to necessarily do evaluation work for full working hours i.e. 8 hours every day and evaluate 30 answer books per day in main subjects and 35 answer books per day in other subjects (Details are given in Spot Guidelines). This is in view of the reduced syllabus and number of questions in question paper.

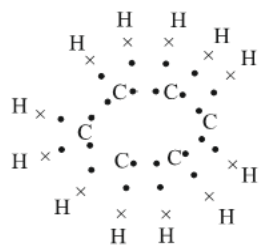
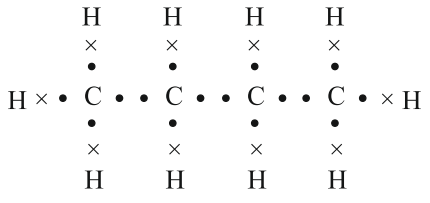
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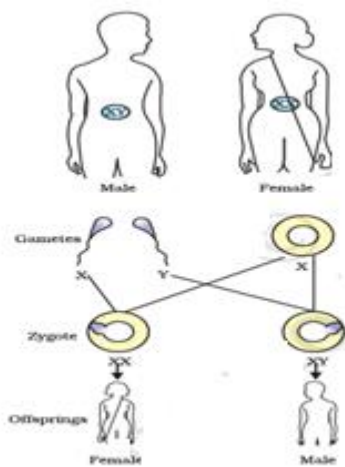
MARKING SCHEME
SECONDARY SCHOOL EXAMINATION TERM-II, 2022
SUBJECT : SCIENCE CODE-086
[PAPER CODE : 31/3/1]

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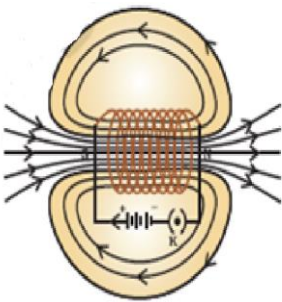
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Maximum Marks : 40

Q. No.	EXPECTED ANSWER / VALUE POINTS	Marks	Total Marks
	SECTION—A		
1.	(a) • Disposable paper cups. • Making of Kulhads on a large scale would result in the loss of fertile top soil. / Disposable paper cups can easily decompose and do not pollute the environment. (or any other suitable answer) OR 1. (b) • Human beings occupy the top level in any food chain therefore maximum concentration of these chemicals get accumulated in our bodies. • Harmful chemicals or pesticides get absorbed from the soil by the plants along with water and minerals therefore ordinary washing cannot remove these harmful chemicals.	1 1 1 1	2
2.	(a)  (b) 	1 1	2

	• Copper T or loop : to prevent pregnancy/to prevent fusion of male & female gametes • Surgical method : To block vas deferens in males or fallopian tube in females to prevent fertilization (Any two)	1 +1	2
6.	(a) • No halfway characteristics were found in the F_1 generation because the F_1 progeny is a mixture of contrasting traits of the parents but only one of the character of the parents gets expressed in F_1 progeny. • The character that gets expressed is a dominant trait and that which does not get expressed in the presence of dominant trait is a recessive trait. OR (b) Mother has XX chromosome. Father has XY chromosome. All children inherit X chromosome from mother. The one who inherits X chromosome from father will be a girl and one who inherits Y chromosome from the father will be a boy. /  (full credit for diagrammatic expression)	1 1 $\frac{1}{2}$ $\frac{1}{2}$ 1	2
7.	(a) Uterus (b) Fallopian tube or oviduct (c) Ovary / As question has printing error, half mark is awarded to all students irrespective of attempted/non attempted (d) Placenta	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	2

	SECTION—B		
8.	- Human made ecosystems are artificial ecosystems that are developed by human beings. Example: an aquarium, crop fields, parks (or any other) (any one) - No, they cannot become self-sustaining ecosystem. - It needs to be cleaned regularly as natural replenishment by decomposers /bacteria (cleansing agents) is not possible. (any other answer with justification)	1+½ ½ 1	3
9.	(a) (i) The forces of attraction between the molecules are weak. (ii) Bonding in carbon compounds does not give rise to any charged particles. (iii) Carbon only shares electrons with other atoms. It is not able to lose four electrons or gain four electrons. OR (b) - A series of compounds in which some functional groups substitute for hydrogen in a carbon chain / the succeeding members differ by -CH₂ unit (14 u) - Difference of CH₂ = 12u + 2u = 14u (i) Melting and boiling points increase with increase in molecular mass. (ii) Chemical properties, determined by the functional group remain same in a homologous series.	1 1 1 1 1 ½ ½	3
10.	- Newland's Law of Octaves - Important features : - The elements were arranged in the order of their increasing atomic mass. - Every eighth element has properties similar to the first element. - Anomalies : - It was assumed that only 56 elements existed in nature and new elements would not be discovered in future. - Unlike elements were put in the same slot/note. (Or any other)	1 ½ ½ ½ ½	3
11.	Solenoid: A coil of many circular turns of insulated copper wire wrapped closely in the shape of a cylinder.	1	

	• Pattern of field lines:  • Field is uniform only inside the solenoid. (Position of the uniform field to be marked in the figure)	1½	
		½	3
12.	(a) (i) • When the key is plugged-in, current starts in coil-1, the magnetic field around the coil is changed. This produces induced current in the coil – 2 and galvanometer shows deflection • There is no change in magnetic field when a steady current starts flowing in the circuit. (ii) Galvanometer shows deflection in the opposite direction. (iii) Conclusion: Induced current is produced only when there is a change in magnetic field which occurs only when the key is plugged in or plugged out. OR (b) (i) Arm <i>AB</i>—Downward, Arm <i>CD</i>—Upward (ii) <i>P</i> and <i>Q</i>—Split ring / Commutator (iii) Arm <i>AB</i> upward, Arm <i>CD</i> downward/Direction of force will get reversed (iv) Fleming's left-hand rule	1 1 1 ½+½ ½, ½ ½ ½	3
13.	• Mendel crossed two pea plants with two different visible contrasting characteristics such as plant with round and green seeds, with plant with wrinkled, yellow seeds. In F_1 progeny all obtained plants have round and yellow seeds which are dominant characters. • F_1 progeny is self-pollinated to produce F_2 progeny and the plant produced in F_2 progeny showed new combination such as plant with round and yellow seeds or plant with wrinkled and green seeds which were not present in parent generation or F_1 progeny. The ratio obtained was 9 round yellow, 3 round green, 3 wrinkled yellow, 1 wrinkled green. Thus, traits are independently inherited.	1 1 1	

	(Full marks should be given if diagrammatically represented)		3
	SECTION—C		
14.	(a) $R_S = R_1 + R_2 + R_3 = 40\Omega$ (b) $\frac{1}{R_p} = \frac{1}{R_B} + \frac{1}{R_C}$ $\frac{1}{R_p} = \frac{1}{30\Omega} + \frac{1}{60\Omega}$ $R_p = 20\Omega$ (c) (i) $R = R_s + R_p$ $= 40\Omega + 20\Omega = 60\Omega$ $\therefore I = \frac{V}{R} = \frac{6V}{60\Omega} = \frac{1}{10} A = 0.1 A$ OR (c) (ii) Resistance, $R = 40\Omega + 60\Omega = 100\Omega$ $\therefore I = \frac{V}{R} = \frac{6V}{100\Omega} = 0.06 A$	$\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ 1 $\frac{1}{2} + \frac{1}{2}$ 1 $\frac{1}{2} + \frac{1}{2}$	4
15.	(a) Leishmania, Kala-azar (b) Plants can bear fruits and flowers much earlier than produced by sexual reproduction Plants produced are genetically similar to the parent plant (Or any other) (c) (i) Bud develops as an outgrowth due to repeated cell division at one specific site, these buds develop into tiny individuals, and when fully mature detach from the parent body and become new independent individuals. (Marks should be awarded if a student draws a well labelled diagram) OR (c) (ii) (I) The filament breaks into smaller pieces or fragments and each fragment grows into new individuals. (II) It releases spores which germinate and eventually develops into new Rhizopus individuals.	$\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ 2 1 1	4

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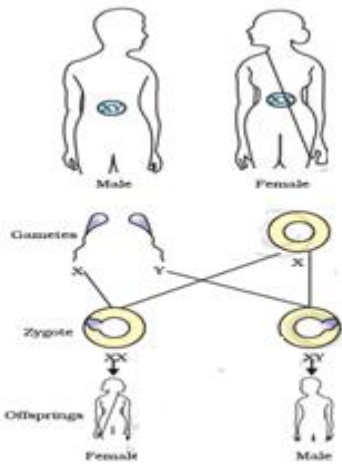
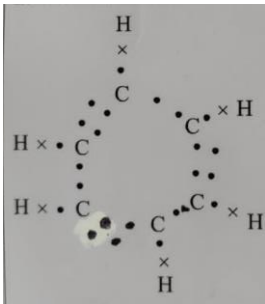
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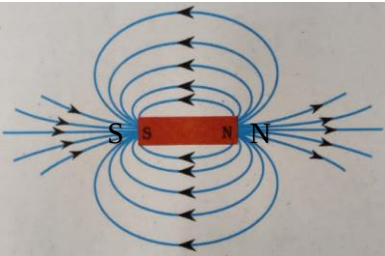
Maximum Marks: 40

Q. No.	EXPECTED ANSWER / VALUE POINTS	Marks	Total Marks
	SECTION—A		
1.	(a) Urethra (b) Testis (c) Vas deferens (d) Seminal vesicle/Prostate gland	$\frac{1}{2} \times 4 = 2$	2
2.	(a) • No halfway characteristics were found in the F_1 generation because the F_1 progeny is a mixture of contrasting traits of the parents but only one of the character of the parents gets expressed in F_1 progeny. • The character that gets expressed is a dominant trait and that which does not get expressed in the presence of dominant trait is a recessive trait. OR (b) Mother has XX chromosome. Father has XY chromosome. All children inherit X chromosome from mother. The one who inherits X chromosome from father will be a girl and one who inherits Y chromosome from the father will be a boy. /	1 1 $\frac{1}{2}$ $\frac{1}{2}$ 1	

	 (full credit for diagrammatic expression)		2
3.	• Barrier method : Prevents the meeting of sperms with ova • Oral pills/Chemical method : Changes the hormonal balance in females so eggs are not released • Copper T or loop : to prevent pregnancy/to prevent fusion of male & female gametes • Surgical method : To block vas deferens in males or fallopian tube in females to prevent fertilization (Any two)	1+1	2
4.	• Electronic configuration of X : 2, 8, 8, 6 • Valency = 2 • Group of X= 6 • Period of X=4	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	2
5.	(a) Electron dot structure of benzene 	1	

	(b) Electron dot structure of ethane <pre> H H × × • • H × • C • • C • × H • • × × H H </pre>	1	2
6.	(a) • Disposable paper cups. • Making of Kulhads on a large scale would result in the loss of fertile top soil. / Disposable paper cups can easily decompose and do not pollute the environment. (or any other suitable answer) OR (b) • Human beings occupy the top level in any food chain therefore maximum concentration of these chemicals get accumulated in our bodies. • Harmful chemicals or pesticides get absorbed from the soil by the plants along with water and minerals therefore ordinary washing cannot remove these harmful chemicals.	1 1	2
7.	(a) P (Power) = V (Potential difference) $\times I$ (Current) Here $P = 1100 \text{ W}$, $V = 220 \text{ V}$, $I = ?$, $R = ?$ $P = \frac{V^2}{R}$ (i) $R = \frac{V^2}{P}$ $= \frac{220^2 \text{ V} \times 220 \text{ V}}{1100 \text{ W}}$ $= 44 \Omega$ (ii) $I = \frac{V}{R}$ $I \text{ (Current)} = \frac{V}{R} = \frac{220 \text{ V}}{44 \Omega} = 5 \text{ A}$ (Accept any other alternative method) OR	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	

[illegible]

	(iii) Arm <i>AB</i> upward, Arm <i>CD</i> downward/Direction of force will get Reversed (iv) Fleming's left-hand rule	$\frac{1}{2}$ $\frac{1}{2}$	3
10.	(a) • Field lines around a bar magnet.  • Position of North pole, South pole- to be marked in the diagram • Field is strongest where lines are crowded / at Poles / or indicated in the diagram. (b) If two field lines cross each other then at the point of intersection, the compass needle would point towards two directions which is not possible.	1 $\frac{1}{2}$ $\frac{1}{2}$ 1	3
11.	• Newland's Law of Octaves • Important features : 1. The elements were arranged in the order of their increasing atomic mass. 2. Every eighth element has properties similar to the first element. • Anomalies : 1. It was assumed that only 56 elements existed in nature and new elements would not be discovered in future. 2. Unlike elements were put in the same slot/note. (Or any other)	1 $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	3
12.	(a) (i) The forces of attraction between the molecules are weak. (ii) Bonding in carbon compounds does not give rise to any charged particles. (iii) Carbon only shares electrons with other atoms. It is not able to lose four electrons or gain four electrons. OR (b) • A series of compounds in which some functional groups substitute for hydrogen in a carbon chain / the consequent members differ by -CH ₂ unit (14 u) • Difference of CH ₂ = 12u + 2u = 14u (i) Melting and boiling points increase with increase in molecular mass. (ii) Chemical properties, determined by the functional group remain same in a homologous series.	1 1 1 1 1 $\frac{1}{2}$ $\frac{1}{2}$	3

13.	(a) Since the 10% energy is available from lower trophic level to higher trophic level therefore the number of individuals decreases. (b) The energy captured by the autotrophs cannot revert back to the solar input / energy once received by herbivores cannot come back to autotrophs Note: similar explanation using any two trophic levels .	1½ 1½	3
	SECTION—C		
14.	(a) Since most organisms would not normally depend on being cut up to be able to reproduce. (b) •Plants can bear fruits and flowers much earlier than produced by sexual reproduction •Plants produced are genetically similar to the parent plant (Or any other) (c) (i) Bud develops as an outgrowth due to repeated cell division at one specific site, these buds develop into tiny individuals, and when fully mature detach from the parent body and become new independent individuals. (Marks should be awarded if a student draws a well labelled diagram) OR (c) (ii) (I) The filament breaks into smaller pieces or fragments and each fragment grows into new individuals. (II) It releases spores which germinate and eventually develops into new Rhizopus individuals.	1 ½ + ½ 2 1 1	4
15.	(a) $R = R_1 + R_2 + R_3$ $= 5\Omega + 10\Omega + 15\Omega$ $= 30\Omega$ (b) $\frac{1}{R_p} = \frac{1}{R_B} + \frac{1}{R_C}$ $\frac{1}{R_p} = \frac{1}{30\Omega} + \frac{1}{60\Omega}$ $R_p = 20\Omega$ (c) (i) $R = R_s + R_p$ $= 40\Omega + 20\Omega = 60\Omega$ $\therefore I = \frac{V}{R} = \frac{6V}{60\Omega} = \frac{1}{10} A = 0.1 A$	1 ½ ½ 1 ½ + ½	

	OR (c) (ii) <i>Resistance</i> , $R = 40\Omega + 60\Omega = 100\Omega$ $\therefore I = \frac{V}{R} = \frac{6V}{100\Omega} = 0.06 A$	1 $\frac{1}{2} + \frac{1}{2}$	4
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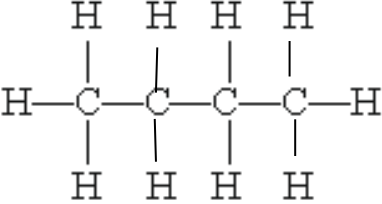
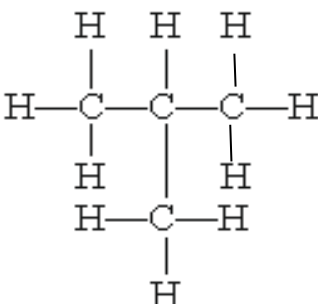
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SUBJECT : SCIENCE CODE–086
[PAPER CODE : 31/3/3]

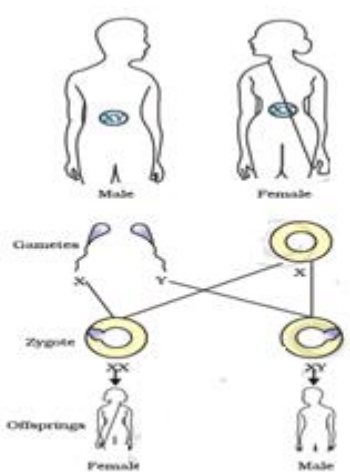
Instructions:-

- The marking scheme carries only suggested value points for the answers.
- These are only guidelines and do not constitute the complete answer.
- The students can have their own expression and if the expression is correct, the marks are awarded accordingly.

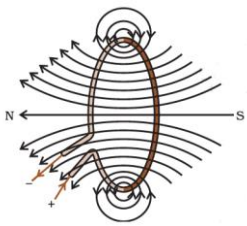
Maximum Marks : 40

Q. No.	EXPECTED ANSWER / VALUE POINTS	Marks	Total Marks
	SECTION—A		
1.	(a) $P(\text{Power}) = V(\text{Potential difference}) \times I(\text{Current})$ Here $P = 1100 \text{ W}$, $V = 220 \text{ V}$, $I = ?$, $R = ?$ $P = \frac{V^2}{R}$ (i) $R = \frac{V^2}{P}$ $= \frac{220^2 \text{ V} \times 220 \text{ V}}{1100 \text{ W}}$ $= 44 \Omega$ (ii) $I = \frac{V}{R}$ $I(\text{Current}) = \frac{V}{R} = \frac{220 \text{ V}}{44 \Omega} = 5 \text{ A}$ (Accept any other alternative method) OR (b) $R_S = R_3 + R_4 = 10 + 10 = 20 \Omega$ $\frac{1}{R_P} = \frac{1}{R_2} + \frac{1}{R_S}$ $= \frac{1}{20} + \frac{1}{20} = \frac{1}{10} \Omega$ $R_P = 10 \Omega$ Total equivalent resistance = $R = R_1 + R_P + R_5$ $= R = 20 + 10 + 10 = 40 \Omega$	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	2

2.	(i) Down the group the effective nuclear charge experienced by valence electron is decreasing because the outer most electron are further away from the nucleus. Therefore, these can be lost easily. (ii) Effective nuclear charge acting on the valence shell electrons increases across a period. The tendency to lose electron will decrease.	1 1	2
3.	Structural isomers of butane  / $\text{CH}_3\text{—CH}_2\text{—CH}_2\text{—CH}_3$  / $\text{CH}_3\text{—CH(CH}_3\text{)—CH}_3$	1 1	2
4.	(a) • Disposable paper cups. • Making of Kulhads on a large scale would result in the loss of fertile top soil. / Disposable paper cups can easily decompose and do not pollute the environment. (or any other suitable answer) OR (b) • Human beings occupy the top level in any food chain therefore maximum concentration of these chemicals get accumulated in our bodies. • Harmful chemicals or pesticides get absorbed from the soil by the plants along with water and minerals therefore ordinary washing cannot remove these harmful chemicals.	1 1 1 1	2
5.	(a) i) Part—D Anther /Stamen ii) Part—A Stigma (b) Ovule converts into Seed; Ovary converts into Fruit	½ ½ ½ + ½	2
6.	• Barrier method : Prevents the meeting of sperms with ova		

	• Oral pills/Chemical method : Changes the hormonal balance in females so eggs are not released • Copper T or loop : to prevent pregnancy/to prevent fusion of male & female gametes • Surgical method : To block vas deferens in males or fallopian tube in females to prevent fertilization (Any two)	1+1	2
7.	(a) • No halfway characteristics were found in the F_1 generation because the F_1 progeny is a mixture of contrasting traits of the parents but only one of the character of the parents gets expressed in F_1 progeny. • The character that gets expressed is a dominant trait and that which does not get expressed in the presence of dominant trait is a recessive trait. OR (b) Mother has XX chromosome. Father has XY chromosome. All children inherit X chromosome from mother. The one who inherits X chromosome from father will be a girl and one who inherits Y chromosome from the father will be a boy. /  (Full credit for diagrammatic expression)	1 1 $\frac{1}{2}$ $\frac{1}{2}$ 1	2
	SECTION-B		
8.	Newland's Law of Octaves Important features: 1. The elements were arranged in the order of their increasing atomic mass. 2. Every eighth element has properties similar to the first element.	1 $\frac{1}{2}$	

	Anomalies: 1. It was assumed that only 56 elements existed in nature and new elements would not be discovered in future. 2. Unlike elements were put in the same slot/note. (Or any other)	½ ½ ½	3
9.	• Mendel crossed two pea plants with two different visible contrasting characteristics such as plant with round and green seeds, with plant with wrinkled, yellow seeds. In F₁ progeny all obtained plants have round and yellow seeds which are dominant characters. • F₁ progeny is self-pollinated to produce F₂ progeny and the plant produced in F₂ progeny showed new combination such as plant with round and yellow seeds or plant with wrinkled and green seeds which were not present in parent generation or F₁ progeny. The ratio obtained was 9 round yellow, 3 round green, 3 wrinkled yellow, 1 wrinkled green. Thus, traits are independently inherited. (Full marks should be given if diagrammatically represented)	1 1 1	3
10.	(a) • The microorganisms, that break down the dead remains and waste products of organisms into simpler substances. • Break down the complex organic wastes into simpler substances and return the nutrients to the soil so that these can be used again by the plants. (b) Decomposers are not able to break down the plastics into its constituents therefore plastics cannot be decomposed. / Plastics are non-bio degradable.	1 1 1	3
11.	(a) (i) The forces of attraction between the molecules are weak. (ii) Bonding in carbon compounds does not give rise to any charged particles. (iii) Carbon only shares electrons with other atoms. It is not able to lose four electrons or gain four electrons. OR (b) • A series of compounds in which some functional groups substitute for hydrogen in a carbon chain / the consequent members differ by -CH₂ unit (14 u) • Difference of CH₂ = 12u + 2u = 14u (i) Melting and boiling points increase with increase in molecular mass.	1 1 1 1 1 ½	

	(ii) Chemical properties, determined by the functional group remain same in a homologous series.	$\frac{1}{2}$	3
12.	(a) Pattern of magnetic field  1 mark for correct representation of direction of magnetic field lines and current. (b) Right-hand thumb rule : Hold a current carrying straight conductor in your righthand such that the thumb points towards the direction of current, then your fingers will wrap around the conductor in the direction of the field lines of the magnetic field.	1 1 1	3
13.	(a) (i) • When the key is plugged-in, current starts in coil-1, the magnetic field around the coil is changed. This produces induced current in the coil – 2 and galvanometer shows deflection • There is no change in magnetic field when a steady current starts flowing in the circuit. (ii) Galvanometer shows deflection in the opposite direction. (iii) Conclusion: Induced current is produced only when there is a change in magnetic field which occurs only when the key is plugged in or plugged out.	1 1 1	3
13.	OR (b) (i) Arm AB—Downward, Arm CD—Upward (ii) P and Q—Split ring / Commutator (iii) Arm AB upward, Arm CD downward/Direction of force will get reversed (iv) Fleming's left-hand rule	$\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2}, \frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	
	SECTION—C		
14.	(a) $R = R_1 + R_2 + R_3$ $= 10\Omega + 20\Omega + 30\Omega$ $= 60\Omega$ (b) $\frac{1}{R_p} = \frac{1}{R_B} + \frac{1}{R_C}$	1 $\frac{1}{2}$	

	$\frac{1}{R_p} = \frac{1}{30\Omega} + \frac{1}{60\Omega}$ $R_p = 20\Omega$ (c) (i) $R = R_s + R_p$ $= 40\Omega + 20\Omega = 60\Omega$ $\therefore I = \frac{V}{R} = \frac{6V}{60\Omega} = \frac{1}{10} A = 0.1 A$ OR (c) (ii) $\text{Resistance, } R = 40\Omega + 60\Omega = 100\Omega$ $\therefore I = \frac{V}{R} = \frac{6V}{100\Omega} = 0.06 A$	$\frac{1}{2}$ 1 $\frac{1}{2} + \frac{1}{2}$ 1 $\frac{1}{2} + \frac{1}{2}$	4
15.	(a) Leishmania, Kala-azar (b) Buds produced in the notches of leaf margins of 'Bryophyllum' develop into new plants, whereas Banana leaves do not have buds in their leaves. (c) (i) Bud develops as an outgrowth due to repeated cell division at one specific site, these buds develop into tiny individuals, and when fully mature detach from the parent body and become new independent individuals. (Marks should be awarded if a student draws a well labelled diagram) OR (c) (ii) (I) The filament breaks into smaller pieces or fragments and each fragment grows into new individuals. (II) It releases spores which germinate and eventually develops into new Rhizopus individuals.	1 1 2 1 1	4

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