

BANGALORE SAHODAYA SCHOOLS COMPLEX

PRE-BOARD EXAMINATION 2017-18

Class: X

GENERAL SCIENCE

Max. Marks: 70

Date: 11.01.2018

SET 1

Time: 3 Hrs.

General Instructions:

1. The question paper comprises of two sections, A & B. You are to attempt both the sections.
 2. All questions are compulsory.
 3. There is no overall choice.
 4. All questions of section A and all questions of section B are to be attempted separately.
 5. Questions numbers 1 to 2 in section A are one mark questions. These are to be answered in one word or one sentence.
 6. Questions numbers 3 to 5 are two mark questions, to be answered in about 30 words each.
 7. Questions numbers 6 to 15 are three mark questions, to be answered in about 50 words each.
 8. Questions numbers 16 to 21 are five mark questions, to be answered in about 70 words each.
 9. Questions numbers 22 to 27 in section B are two mark questions based on practical skills.
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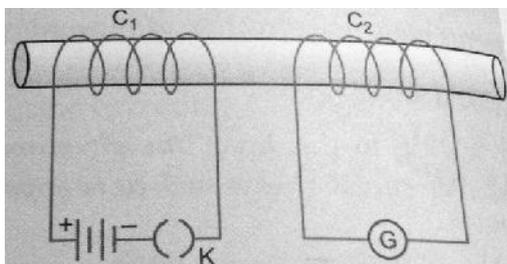
1. Differentiate between the male and the female gamete in mammals.
2. What is the role of guard cell in opening of stomata?
3. Give reasons for the following:
(a) Sky appears blue
(b) Clouds appear white } to an observer on earth
4. (a) How is nuclear energy generated?
(b) Why is the large scale use of nuclear energy prohibited?

5. Answer the questions based on the given table:

	I ⁻	NO ₃ ⁻	SO ₄ ²⁻	CO ₃ ²⁻
K ⁺	Soluble Colourless	Soluble Colourless	Soluble Colourless	Soluble Colourless
Pb ²⁺	Insoluble Yellow	Soluble Colourless	Insoluble White	Insoluble White
Cu ²⁺	Insoluble Light brown	Soluble Bright blue	Soluble Bright blue	Insoluble Olive green
Hg ²⁺ (l)	Insoluble Orange pink	Soluble Colourless	Insoluble Yellow	Insoluble Orange brown
Na ⁺	Soluble Colourless	Soluble Colourless	Soluble Colourless	Soluble Colourless

- (a) Write the equation for the reaction in which orange brown compound is produced.
 (b) Write the formula for any other 2 precipitates produced in the given table.

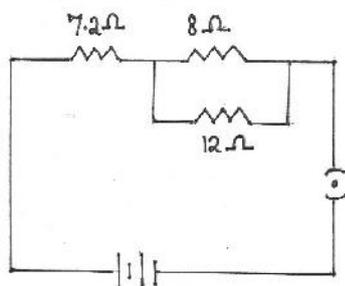
6. Observe the figure.



Two coils of insulated copper wire are wound as shown.

What would you observe

- (a) If the key in the figure is closed?
 (b) If the battery is replaced by an ac source and the key is closed?
 (c) Name and state the phenomena responsible for the observations in (a) and (b).
7. A person uses spectacles of power $-4D$.
 (a) Identify the defect.
 (b) Draw the ray diagram showing the defect and its correction.
8. Answer the following questions based on the circuit diagram.



- Calculate (a) the total current (b) the potential difference across the 8Ω resistor
 (c) the power dissipated in the 7.2Ω resistor.

OR

- (a) Define resistivity of a wire and state its SI unit.
 (b) Calculate the resistivity of a 400cm long copper wire that has a cross-sectional area of 2cm^2 and resistance is 2Ω .
9. A student stated that metals react with bases.
 (a) Support his statement with a balanced chemical equation.
 (b) What are such metals called?
 (c) Write the balanced chemical equation for the reaction of the same metal with dil. H_2SO_4
 (d) How will you test the gas evolved during both these reactions?

10. (a) Write the chemical formula of potassium carbonate.
(b) Name the acid and base from which it is made.
(c) With respect to strength what type of acid and base are they?
(d) What is the chemical nature of the salt?

OR

- (a) "X" is a compound used for softening the hard water. Write the chemical formula of "X".
(b) What type of salt is "X"?
(c) What happens when "X" is heated?
(d) Name the acid and base used to obtain compound "X".
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11. "M" is a reddish brown metal, Curd should not be stored in the container made out of this metal.
(a) Identify "M".
(b) Give reason as to why curd should not be stored in "M".
(c) List the steps of obtaining metal "M" from its concentrated ore with necessary equations.
12. (a) Which type of receptor will help in detecting taste? How does this information travel along a neuron and across two neurons?
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13. How did Mendel prove that traits can be dominant or recessive?

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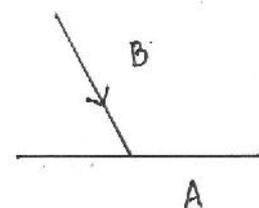
How did Mendel prove that traits are independently inherited?

14. Taking a current example, show that dissimilar looking structures evolve from a common ancestral design.
15. Government has fixed the marriageable age at 18 and 21 for girls and boys respectively. Give two reasons behind this decision. What are the two advantages of using contraceptives? Why is there an imbalance in the sex ratio in society?
16. (a) Define the following terms for a spherical mirror : (i) pole (ii) aperture
(b) Draw the ray diagram showing the use of a spherical mirror as a shaving mirror.
(c) An object of size 5cm is placed 25cm from the pole of a convex mirror of radius of curvature 30cm. calculate the position and size of the image. What will be the nature of the image?

OR

- (a) State the laws of refraction of light.
(b) The speed of light in medium A is 2.5×10^8 m/s and in medium B is 2×10^8 m/s .
A ray of light is entering medium A from medium B as shown.

- (i) Which of the two media is optically denser?
 (ii) Copy and complete the diagram to show the path of the refracted ray.
 (ii) Calculate the refractive index of medium A, with respect to medium B.



17. (a) Name the device which converts electrical energy to mechanical energy.
 (b) State the principle on which it works.
 (c) Explain its working with the help of a suitable diagram.
 (d) Name an appliance in which it is used.

18. Study the table given below and answer the given questions by identifying the elements:

Group Period ↓	1	2	13	14	15	16	17	18
1	A							M
2	B	E	H	I	J	K	L	N
3	C	F	T	S	R	Q	P	O
4	D	G						

- (a) Identify the position of K.
 (b) Name the element with the largest radius in the period to which “K” belongs. Give reason for your answer.
 (c) What type of compound will “K” form when it reacts with (i) element “C” and (ii) element Q?
 (d) Write the chemical formulae for the compounds formed between
 (i) K and C (ii) K and Q.
 (e) Which one of the compound formed in the above cases (i) and (ii) will have a high M.P? Give reason for your answer.
19. Molecular mass of an organic solvent, “P” is 46u. “P” is used to remove chlorophyll from the leaf in the lab.
- (a) Identify “P”.
 (b) Write the equations when “P” is oxidized.
 (i) in the presence of oxidising agent
 (ii) in the absence of oxidising agent
 (c) “P” reacts with the product formed in the reaction (b) (i) given above, which forms a fruity smelling compound.
 (i) Write the equation for the same.
 (ii) Fruity smelling compound is treated with an alkali. Name the process.
 (d) Explain the cleansing action of soap.

OR

Molecular mass of an organic solvent “P” is 46u. “P” is used to remove chlorophyll from the leaf in the lab.

- “P” is treated with conc. H_2SO_4 . Write the equation for the reaction.
- What is the role of conc. H_2SO_4 in the above reaction?
- The product obtained in the above reaction is treated with H_2 gas.
 - Write the equation for the reaction.
 - What is the practical application of the above reaction?
- Name the homologous series to which the product obtained in case (c) (i) belongs.
- Write any 2 isomers of the 6th member of the above homologous series.

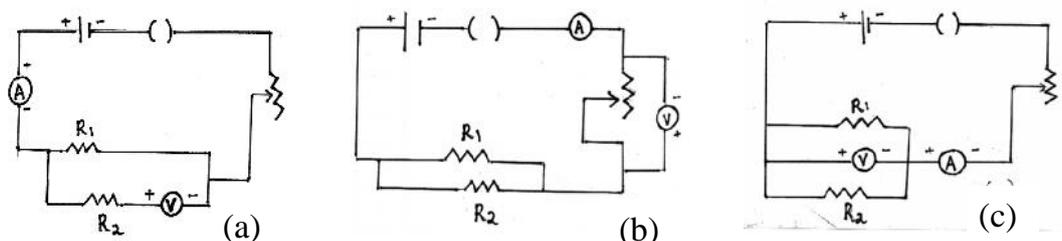
20. Draw a neat structure of human heart and label the following.

- The blood vessel that brings
 - oxygenated blood to the heart
 - deoxygenated blood to the heart
 - Chamber of the heart which pumps oxygenated blood to all parts of the body.
- Name the artery which brings blood to the kidney.
- How is the amount of water in the blood regulated by kidney?

- What would be the advantages of exploiting resources with short term aims?
- How would these advantages differ from the advantages of using a long term perspective of managing resources?
- How do traditional water harvesting structures ensure sustainable development?

SECTION – B

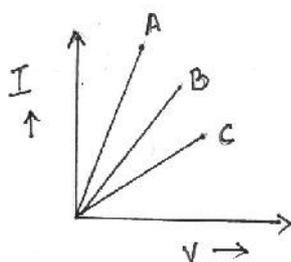
22. Three students draw the circuit diagram to find the effective resistance when two resistors are connected in parallel.



Which of these is the correct circuit diagram for the experiment? Give reasons.

OR

Study the I-V graph of three wires A, B and C to answer the following questions.



- (a) Which among the three is the best conductor? Give reasons.
- (b) If C and B are made of the same material and have equal length, which of the two is thicker?

23. Draw the ray diagram to show image formation in a convex lens when

- (a) object is placed between F and 2F
- (b) object is between F and O.

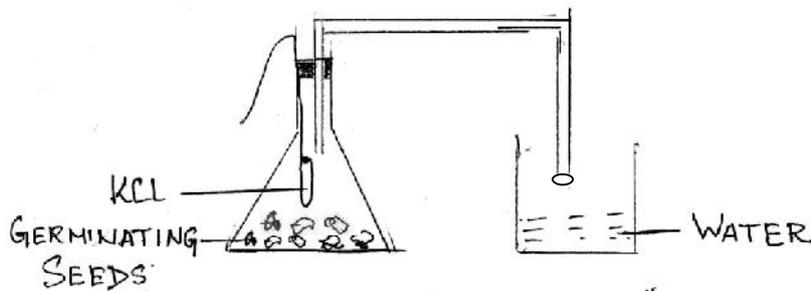
24. You are given the solution of the following with known concentration. Arrange them in the increasing order of their p^H value.

- (a) Lemon juice , (b) gastric juice (c) lime water , (d) caustic soda
- (b) What will be the change in colour of p^H paper when tested in (i) lemon juice (ii) lime water?

25. 5ml of acetic acid is added to 20ml of distilled water. The mixture is stirred well in the beaker.

- (a) Which property of acetic acid is exhibited here?
- (b) When soap is added to the above mixture will it produce lather? Give reason for your answer.

26. (a) The following set up is arranged to conduct the activity on respiration of germinating seeds. Identify the errors in the set-up.



- (b) Write the equation representing aerobic respiration.

27. Draw the diagram of a germinating dicot seed and label the following parts.

- (a) Part of the seed which stores food
- (b) Part of the embryo that develops into shoot

*****Best of Luck*****

General Science Answer Key - Class 10 {SET 1}

SN	Value Points	Marks	
1.	<p>Male gamete</p> <p>* Smaller in size</p> <p>* Motile</p> <p>(Any one difference)</p>	<p>Female gamete</p> <p>* Bigger in size</p> <p>* Non- motile</p>	1
2.	Role of guard cell- absorbs water, increases in size and creates stomatal opening	1	
3.	When sunlight enters the earth's atmosphere the fine particles in air scatter the blue colour more strongly than red as blue has shorter wavelength.	1	
	Clouds contain large dust particles and water droplets which scatter all wavelengths of light nearly uniformly. So clouds appear white.	1	
4.	By nuclear fission.(splitting the nucleus of a heavy atom into lighter nuclei)	1	
	High cost of installation, environmental contamination, limited availability of uranium (any two)	1/2 1/2	
5.	(a) $\text{Hg}(\text{OH})_2 + \text{H}_2\text{CO}_3 \rightarrow \text{HgCO}_3 \downarrow + \text{H}_2\text{O}$	1	
	(b) 2 formulae of any 2 precipitates other than given in the question.	1/2+1/2	
	(a) The galvanometer needle will show a momentary deflection.	1	
	(b) The galvanometer needle will deflect continuously in both directions.	1	
6.	(c) Electromagnetic induction. A changing magnetic field in a conductor induces a current in another conductor.	1	
7.	(a) Myopia (Near –Sightedness)	1	
	(b) Ray diagrams [NCERT Page 189 fig 11.2 (b) and (c)]	1+1	
8.	(a) $1/R_p = 1/8 + 1/12 = 10/48$	1	
	$R_p = 4.8$; Total R = $4.8 + 7.2 = 12$	1	
	$I = 0.5\text{A}$	1/2	
	(b) Potential difference across 8 = $0.5 \times 4.8 = 2.4\text{V}$	1/2	
	(c) Power dissipated in 7.2 = $I^2R = (0.5)^2 \times 7.2 = 1.8\text{W}$	1	
	<u>OR</u>		
	(a) The resistance of a conductor of unit length and unit area of cross section of a material at a certain temperature.	1	
	Its SI unit is m	1/2	

(b) $R = \frac{\dots l}{A}$ 1/2
 $\dots = RA/l = 2 \times 2 \times 10^{-4} / 4 = 10^{-4} \text{ m or } 10^{-2} \text{ cm}$ 1

9. (i) $Zn + 2 NaOH \rightarrow Na_2ZnO_2 + H_2$ (Any other equation) 1
 [1/2 for balancing and 1/2 for equation]
 (ii) amphoteric metals 1/2
 (iii) $Zn + H_2SO_4 \rightarrow ZnSO_4 + H_2$ 1
 (iv) bring a burning splinter near the gas . it burns with a pop sound. 1/2

10. (i) K_2CO_3 1/2
 (ii) Carbonic acid / H_2CO_3 1/2 + 1/2
 Potassium hydroxide / KOH
 (iii) Weak acid , Strong base 1/2 + 1/2
 (iv) Basic salt 1/2

OR

- (i) $Na_2CO_3 \cdot 10H_2O$ 1/2
 (ii) Basic 1/2
 (iii) It forms a monohydrate salt / anhydrous salt 1/2
 (iv) Carbonic acid / H_2CO_3 , Sodium hydroxide / NaOH 1/2 + 1/2
 (v) Basic salt 1/2

11. a) Copper 1/2
 b) Copper reacts with oxygen, moisture , carbon di oxide to form green colour compound / basic cupric carbonate 1/2
 c) $2Cu_2S + 3O_2 \rightarrow 2Cu_2O + 2SO_2$
 $Cu_2S + 2Cu_2O \rightarrow 6Cu + SO_2$
 (1/2 mark for each equation and 1/2 mark for balancing) 1/2 × 4

12. (a) Gustatory receptor 1/2
 Along the neuron as an electrical impulse 1/2
 Across two neurons- neuron with the help of neurotransmitters impulse moves from axon endings of one neuron to the dendrites of the next 1
 (b) * Reach all the cells of the body
 * Prolonged response to stimulus 1

13.	Show monohybrid cross	1
	F1 generation- dominant trait is seen in heterozygous condition	1/2
	F2 generation – 3:1 ratio of the two phenotypes	1/2
	Conclusion – out of the pair of contrasting characteristics, one is dominant over the other	1

OR

	Show dihybrid cross	1
	F2 generation – new combination of variants; ratio 9:3:3:1	1/2 + 1/2
	Conclusion – since two new combinations of traits are seen in F2 generation, it shows that traits are inherited independently	1
14.	Wild Cabbage- Artificial Selection [any other correct example]	1/2
	Selection of any two traits with proper mention of traits	2
	Conclusion	1/2

15.	Any two * Mental maturity/ Emotional maturity / * Financial independence to handle the responsibilities	1/2 + 1/2
	Any two	
	* Restriction of family size/ * Spacing between siblings/ * Avoid unwanted pregnancy	1
	Sex ratio: preference for male child leading to female foeticide/ infanticide	1

16.	(a) i) Pole : the midpoint of a spherical mirror	1/2
	ii) Aperture: The diameter of the reflecting surface of a spherical mirror.	1/2
	(b) Ray diagram [NCERT page 166 , fig 10.7 (f)]	
	(c) $h = +5\text{cm}$, $u = - 25\text{cm}$, $f = R/2 = 15\text{cm}$	1
	$1/v + 1/u = 1/f$ or $1/v = 1/f - 1/u = 1/15 - 1/-25$	
	Or $1/v = 8/75$; $v = 75/8 = 9.375\text{cm}$	1
	$h' = -vh/u = - 9.375 \times 5 / - 25 = 1.875\text{cm}$	1/2
	Image is virtual and erect.	1

OR

(a) i)	The incident ray, refracted ray and the normal to the interface of two transparent media at the point of incidence, all lie in the same plane.	1
ii)	The ratio of sine of angle of incidence to the sine of angle of refraction is constant for the light of a given colour and for the given pair of media.	1
(b) i)	B	1

- (a) $C_2H_5OH \xrightarrow{\text{Conc. } H_2SO_4} CH_2 = CH_2 + H_2O$ 1
- (b) Dehydrating agent 1/2
- (c) (i) $CH_2 = CH_2 + H_2 \xrightarrow{Ni / Pd + \Delta} CH_3 - CH_3$ 1
(Condition 1/2 + equation 1/2)
- (ii) Hydrogenation of oils 1/2
- (d) Alkanes 1/2
- (e) 6th member of alkanes is C_6H_{14} 1/2
2 isomers (1 mark each isomer)
 $CH_3 - CH_2 - CH_2 - CH_2 - CH_2 - CH_2 - CH_3$
n-hexane 1
1 2 3 4 5
 $CH_3 - \underset{\begin{array}{c} | \\ CH_3 \end{array}}{CH} - CH_2 - CH_2 - CH_3$ 2-methylpentane
(or any other structures)

20. Structure of heart [Fig. 6.10 Pg No. 106 NCERT Science Textbook] 2
- (a) Label- pulmonary vein, venacava, left ventricle 1/2 + 1/2
+ 1/2
- (b) Renal Artery 1/2
Water regulation by kidney- selective reabsorption of water in nephric tubule
depending on the quantity of nitrogenous wastes in blood and amount of excess
water in the body 1
21. a) * Faster economic growth 1
* Availability of resources for developmental activities
- b) Any two * Equitable distribution of resources- social equality / 2
* Resources available for future generations /
* Lesser environmental degradation /
* Sustainable development
- c) Any two
* Recharge of ground water ensures continuous availability of water /
* Amicable sharing of water / 2
* Will not cause ecological imbalance /
* Avoids mismanagement and overexploitation of resources

SECTION – B

22. Fig (c) .only in this figure the voltmeter will measure the potential difference of the resistors in parallel. 1+1
- OR**
- (a) A, least resistance 1
- (b) B. 1
23. (a) Ray diagram [NCERT page 180,fig 10.16 (d)] 1
- (b) Ray diagram [NCERT page 181,fig 10.16 (f)] 1
24. (a) Gastric juice lemon juice lime water caustic soda 1
- (b) Red/orange ½
- (c) Blue / purple ½
- (* No marks to be awarded if **ALL** the samples are not in order)
25. (a) Miscibility ½
- (b) Yes. ½
- (c) As presence of acetic acid does not make the water hard. 1
26. a) Errors- * Bent tube not inserted completely in beaker containing water ½
- * Micro test tube does not have substance that can absorb carbon dioxide like KOH ½
- b) $C_6H_{12}O_6 + 6O_2 \longrightarrow 6CO_2 + 6H_2O$ 1
27. Structure of seed- Fig 8.9 Pg No. 135 in NCERT Science textbook 1
- i) Cotyledon ii) Plumule ½ + ½

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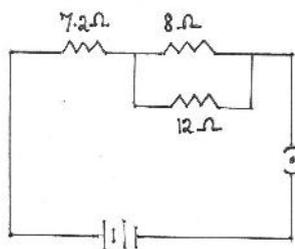
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Na^+	Soluble Colourless	Soluble Colourless	Soluble Colourless	Soluble Colourless

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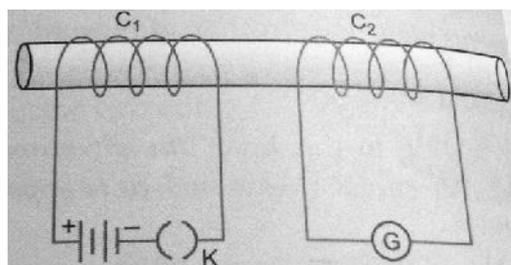
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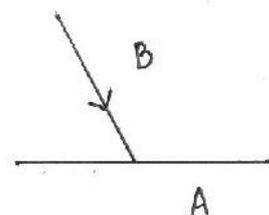
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(c) Explain its working with the help of a suitable diagram.
(d) Name an appliance in which it is used.

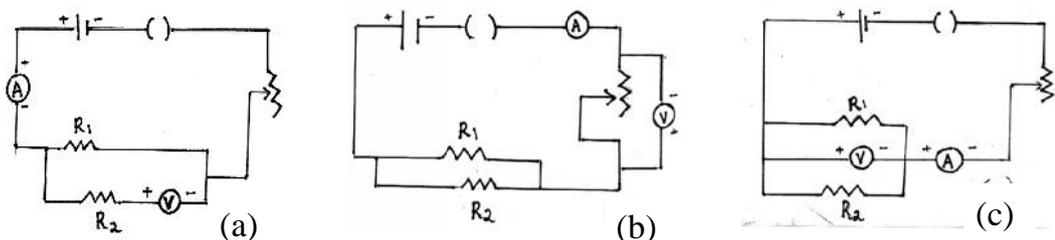
21. Study the table given below and answer the given questions by identifying the elements:

Group Period ↓	1	2	13	14	15	16	17	18
1	A							M
2	B	E	H	I	J	K	L	N
3	C	F	T	S	R	Q	P	O
4	D	G						

- (a) Identify the position of K.
 (b) Name the element with the largest radius in the period to which “K” belongs. Give reason for your answer.
 (c) What type of compound will “K” form when it reacts with (i) element “C” and (ii) element Q?
 (d) Write the chemical formulae for the compounds formed between (i) K and C (ii) K and Q.
 Which one of the compound formed in the above cases (i) and (ii) will have a high M.P? Give reason for your answer.

SECTION – B

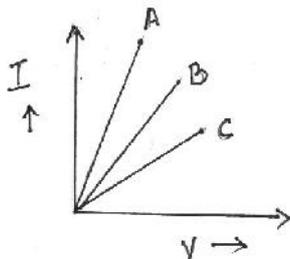
22. Three students draw the circuit diagram to find the effective resistance when two resistors are connected in parallel.



Which of these is the correct circuit diagram for the experiment? Give reasons.

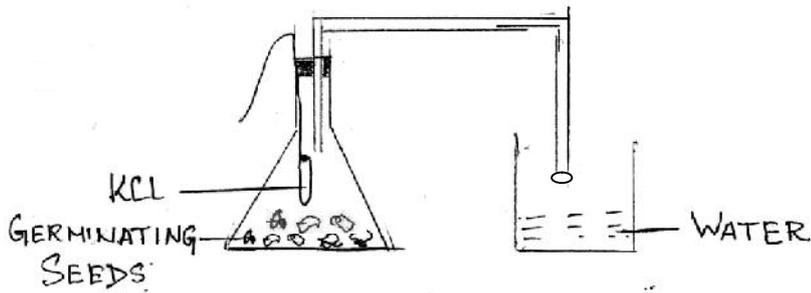
OR

Study the I-V graph of three wires A, B and C to answer the following questions.



- (a) Which among the three is the best conductor? Give reasons.
 If C and B are made of the same material and have equal length, which of the two is thicker?

23. (a) The following set up is arranged to conduct the activity on respiration of germinating seeds. Identify the errors in the set-up.



- (b) Write the equation representing aerobic respiration.
24. Draw the diagram of a germinating dicot seed and label the following parts.
- (a) Part of the seed which stores food
(b) Part of the embryo that develops into shoot
25. You are given the solution of the following with known concentration. Arrange them in the increasing order of their p^H value.
- (a) Lemon juice , (b) gastric juice (c) lime water , (d) caustic soda
(b) What will be the change in colour of p^H paper when tested in (i) lemon juice (ii) lime water ?
26. Draw the ray diagram to show image formation in a convex lens when
- (a) object is placed between F and 2F
(b) object is between F and O.
27. 5ml of acetic acid is added to 20ml of distilled water. The mixture is stirred well in the beaker.
- (a) Which property of acetic acid is exhibited here?
(b) When soap is added to the above mixture will it produce lather? Give reason for your answer.

*****Best of Luck*****

General Science Answer Key Class 10 {Set 2}

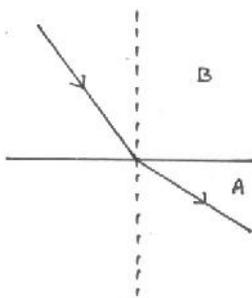
SN	Value Points	Marks								
1.	Role of guard cell- absorbs water, increases in size and creates stomatal opening	1								
2.	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Male gamete</td> <td style="width: 50%;">Female gamete</td> </tr> <tr> <td>* Smaller in size</td> <td>* Bigger in size</td> </tr> <tr> <td>* Motile</td> <td>* Non- motile</td> </tr> <tr> <td colspan="2">(Any one difference)</td> </tr> </table>	Male gamete	Female gamete	* Smaller in size	* Bigger in size	* Motile	* Non- motile	(Any one difference)		1
Male gamete	Female gamete									
* Smaller in size	* Bigger in size									
* Motile	* Non- motile									
(Any one difference)										
3.	(a) $\text{Hg}(\text{OH})_2 + \text{H}_2\text{CO}_3 \rightarrow \text{HgCO}_3 \downarrow + \text{H}_2\text{O}$ (b) 2 formulae of any 2 precipitates other than given in the question.	1 ½+½								
4.	By nuclear fission.(splitting the nucleus of a heavy atom into lighter nuclei) High cost of installation, environmental contamination, limited availability of uranium (any two)	1 ½ ½								
5.	When sunlight enters the earth's atmosphere the fine particles in air scatter the blue colour more strongly than red as blue has shorter wavelength. Clouds contain large dust particles and water droplets which scatter all wavelengths of light nearly uniformly. So clouds appear white.	1 1								
6.	(i) $\text{Zn} + 2 \text{NaOH} \rightarrow \text{Na}_2\text{ZnO}_2 + \text{H}_2$ (Any other equation) [½ for balancing and ½ for equation] (ii) amphoteric metals (iii) $\text{Zn} + \text{H}_2\text{SO}_4 \rightarrow \text{ZnSO}_4 + \text{H}_2$ (iv) bring a burning splinter near the gas . it burns with a pop sound.	1 ½ 1 ½								
7.	(a) Myopia (Near –Sightedness) (b) Ray diagrams [NCERT Page 189 fig 11.2 (b) and (c)]	1 1+1								
8.	(a) $1/R_p = 1/8 + 1/12 = 10/48$ $R_p = 4.8$; Total R = $4.8 + 7.2 = 12$ $I = 0.5\text{A}$ (b) Potential difference across 8 = $0.5 \times 4.8 = 2.4\text{V}$ (c) Power dissipated in 7.2 = $I^2R = (0.5)^2 \times 7.2 = 1.8\text{W}$	1 ½ ½ 1								

OR

- (a) The resistance of a conductor of unit length and unit area of cross section of a material at a certain temperature. 1
Its SI unit is Ω $\frac{1}{2}$
- (b) $R = \frac{\rho l}{A}$ $\frac{1}{2}$
 $\rho = RA/l = 2 \times 2 \times 10^{-4} / 4 = 10^{-4} \text{ m or } 10^{-2} \text{ cm}$ 1
9. (a) The galvanometer needle will show a momentary deflection. 1
(b) The galvanometer needle will deflect continuously in both directions. 1
(c) Electromagnetic induction. A changing magnetic field in a conductor induces a current in another conductor. 1
10. (i) K_2CO_3 $\frac{1}{2}$
(ii) Carbonic acid / H_2CO_3 $\frac{1}{2} + \frac{1}{2}$
Potassium hydroxide / KOH $\frac{1}{2} + \frac{1}{2}$
(iii) Weak acid , Strong base $\frac{1}{2}$
(iv) Basic salt $\frac{1}{2}$
- OR**
- (i) $Na_2CO_3 \cdot 10H_2O$ $\frac{1}{2}$
(ii) Basic $\frac{1}{2}$
(iii) It forms a monohydrate salt / anhydrous salt $\frac{1}{2}$
(iv) Carbonic acid / H_2CO_3 , Sodium hydroxide / NaOH $\frac{1}{2} + \frac{1}{2}$
(v) Basic salt $\frac{1}{2}$
11. a) Gustatory receptor $\frac{1}{2}$
Along the neuron as an electrical impulse $\frac{1}{2}$
Across two neurons- neuron with the help of neurotransmitters impulse moves from axon endings of one neuron to the dendrites of the next 1
- b) * Reach all the cells of the body 1
* Prolonged response to stimulus
12. a) Copper $\frac{1}{2}$
b) Copper reacts with oxygen, moisture , carbon di oxide to form green colour compound / basic cupric carbonate $\frac{1}{2}$
c) $2Cu_2S + 3O_2 \rightarrow 2Cu_2O + 2SO_2$
 $Cu_2S + 2Cu_2O \rightarrow 6Cu + SO_2$
($\frac{1}{2}$ mark for each equation and $\frac{1}{2}$ mark for balancing) $\frac{1}{2} \times 4$

13. Show monohybrid cross 1
 F1 generation- dominant trait is seen in heterozygous condition 1/2
 F2 generation – 3:1 ratio of the two phenotypes 1/2
 Conclusion – out of the pair of contrasting characteristics, one is dominant over the other 1
- OR**
- Show dihybrid cross 1
 F2 generation – new combination of variants; ratio 9:3:3:1 1/2 + 1/2
 Conclusion – since two new combinations of traits are seen in F2 generation, it shows that traits are inherited independently 1
14. Any two * Mental maturity/ Emotional maturity / * Financial independence to handle the responsibilities 1/2 + 1/2
- Any two
 * Restriction of family size/ * Spacing between siblings/ * Avoid unwanted pregnancy 1
- Sex ratio: preference for male child leading to female foeticide/ infanticide 1
15. Wild Cabbage- Artificial Selection [any other correct example] 1/2
 Selection of any two traits with proper mention of traits 2
 Conclusion 1/2
16. (a) i) Pole : the midpoint of a spherical mirror 1/2
 ii) Aperture: The diameter of the reflecting surface of a spherical mirror. 1/2
 (b) Ray diagram [NCERT page 166 , fig 10.7 (f)]
 (c) $h = +5\text{cm}$, $u = - 25\text{cm}$, $f = R/2 = 15\text{cm}$ 1
 $1/v + 1/u = 1/f$ or $1/v = 1/f - 1/u = 1/15 - 1/-25$
 Or $1/v = 8/75$; $v = 75/8 = 9.375\text{cm}$ 1
 $h' = -vh/u = - 9.375 \times 5 / - 25 = 1.875\text{cm}$ 1/2
 Image is virtual and erect. 1
- OR** 1/2
- (a) i) The incident ray, refracted ray and the normal to the interface of two transparent media at the point of incidence, all lie in the same plane. 1
 ii) The ratio of sine of angle of incidence to the sine of angle of refraction is constant for the light of a given colour and for the given pair of media. 1

(b) i) B 1



1

ii) fig showing refracted ray bending away from the normal.

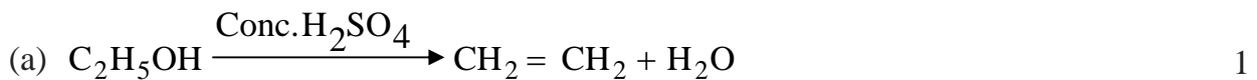
iii) $n_{AB} = \frac{2 \times 10^8}{2.5 \times 10^8} = 0.8$

1

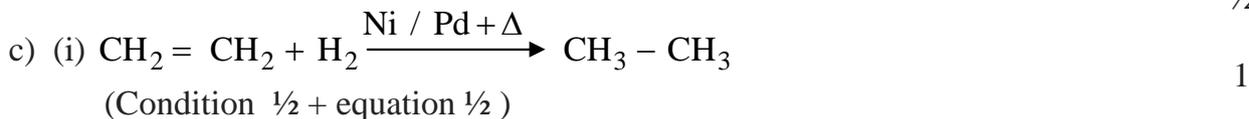
17. Structure of heart [Fig. 6.10 Pg No. 106 NCERT Science Textbook] 2
- a) Label- pulmonary vein, venacava, left ventricle ½ + ½
+ ½
- b) Renal Artery ½
- Water regulation by kidney- selective reabsorption of water in nephric tubule depending on the quantity of nitrogenous wastes in blood and amount of excess water in the body 1
18. a) * Faster economic growth 1
- * Availability of resources for developmental activities
- b) Any two * Equitable distribution of resources- social equality / 2
- * Resources available for future generations /
- * Lesser environmental degradation /
- * Sustainable development
- c) Any two
- * Recharge of ground water ensures continuous availability of water /
- * Amicable sharing of water / 2
- * Will not cause ecological imbalance /
- * Avoids mismanagement and overexploitation of resources
19. (a) Alcohol / Ethanol/Ethyl alcohol ½
- (b) (i)
$$\text{C}_2\text{H}_5\text{OH} + (\text{O}) \xrightarrow[\Delta]{\text{alk. KMnO}_4 / \text{Acidified K}_2\text{Cr}_2\text{O}_7} \text{CH}_3\text{COOH} + \text{H}_2\text{O}$$
 1
- (ii)
$$\text{C}_2\text{H}_5\text{OH} + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$$
- (c) (i)
$$\text{C}_2\text{H}_5\text{OH} + \text{CH}_3\text{COOH} \rightarrow \text{CH}_3\text{COOC}_2\text{H}_5 + \text{H}_2\text{O}$$
- (ii) Saponification reaction ½

- d) Hydrophobic end attaches to dirt. Hydrophilic end will be in water. 1
 they form the micelle remaining dirt will be removed by agitation

OR



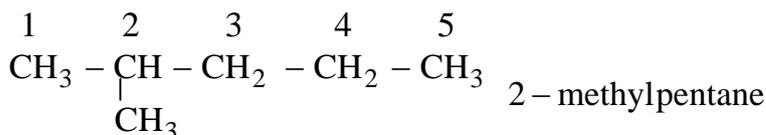
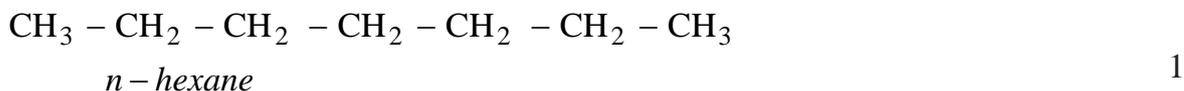
b) Dehydrating agent 1/2



(ii) Hydrogenation of oils 1/2

(d) Alkanes 1/2

(e) 6th member of alkanes is C_6H_{14} 1/2
 2 isomers (1 mark each isomer)



(or any other structures)

20. (a) Motor 1/2

(b) A current carrying conductor experiences a mechanical force in a magnetic field. 1

(c) [NCERT page 232 fig 13.15] 1
 For working,

A mechanical force acts in opposite directions in arms AB and CD according to Fleming's left hand rule. So the coil rotates anticlockwise. After half rotation the arms interchange their positions. The direction of current is reversed every half rotation by the split ring (commutator). Hence the motor continues rotating in the same direction. 2

(d) Any appliance. 1/2

21. (a) Group 16 , period 2 1/2 + 1/2

(b) B , Atomic size decreases from left to right across the period. 1/2 + 1/2

(c) (i) Ionic (ii) Covalent 1/2 + 1/2

(d) Na_2O , SO_2 1/2 + 1/2

(e) Na_2O , Ionic compound 1/2 + 1/2

SECTION – B

22. Fig (c) .only in this figure the voltmeter will measure the potential difference of the resistors in parallel. 1+1
- OR**
- (a) A, least resistance 1
- (b) B. 1
23. a) Errors- * Bent tube not inserted completely in beaker containing water ½
* Micro test tube does not have substance that can absorb carbon dioxide like KOH ½
- b) $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$ 1
24. Structure of seed- Fig 8.9 Pg No. 135 in NCERT Science textbook 1
i) Cotyledon ½ ii) Plumule ½
25. (a) Gastric juice lemon juice lime water caustic soda 1
(b) Red/orange ½
(c) Blue / purple ½
(* No marks to be awarded if **ALL** the samples are not in order)
26. (a) Ray diagram [NCERT page 180,fig 10.16 (d)] 1
(b) Ray diagram [NCERT page 181,fig 10.16 (f)] 1
27. (a) Miscibility ½
(b) Yes. ½
(c) As presence of acetic acid does not make the water hard. 1

BANGALORE SAHODAYA SCHOOLS COMPLEX

PRE-BOARD EXAMINATION 2017-18

Class: X

GENERAL SCIENCE

Max. Marks: 70

Date: 11.01.2018

SET 3

Time: 3 Hrs.

General Instructions:

1. The question paper comprises of two sections, A & B. You are to attempt both the sections.
 2. All questions are compulsory.
 3. There is no overall choice.
 4. All questions of section A and all questions of section B are to be attempted separately.
 5. Questions numbers 1 to 2 in section A are one mark questions. These are to be answered in one word or one sentence.
 6. Questions numbers 3 to 5 are two mark questions, to be answered in about 30 words each.
 7. Questions numbers 6 to 15 are three mark questions, to be answered in about 50 words each.
 8. Questions numbers 16 to 21 are five mark questions, to be answered in about 70 words each.
 9. Questions numbers 22 to 27 in section B are two mark questions based on practical skills.
-

1. Differentiate between the male and the female gamete in mammals.
2. What is the role of guard cell in opening of stomata?
3. Give reasons for the following:
(a) Sky appears blue
(b) Clouds appear white } to an observer on earth

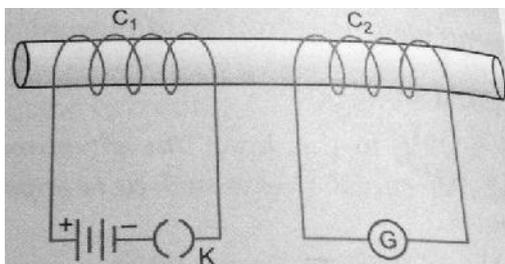
4. Answer the questions based on the given table:

	I^-	NO_3^-	SO_4^{2-}	CO_3^{2-}
K^+	Soluble Colourless	Soluble Colourless	Soluble Colourless	Soluble Colourless
Pb^{2+}	Insoluble Yellow	Soluble Colourless	Insoluble White	Insoluble White
Cu^{2+}	Insoluble Light brown	Soluble Bright blue	Soluble Bright blue	Insoluble Olive green
$Hg^{2+}(l)$	Insoluble Orange pink	Soluble Colourless	Insoluble Yellow	Insoluble Orange brown
Na^+	Soluble Colourless	Soluble Colourless	Soluble Colourless	Soluble Colourless

- (a) Write the equation for the reaction in which orange brown compound is produced.
- (b) Write the formula for any other 2 precipitates produced in the given table.

5. (a) How is nuclear energy generated?
 (b) Why is the large scale use of nuclear energy prohibited?

6. Observe the figure.

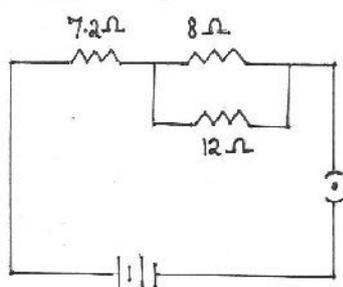


Two coils of insulated copper wire are wound as shown.

What would you observe

- (a) If the key in the figure is closed?
 (b) If the battery is replaced by an ac source and the key is closed?
 (c) Name and state the phenomena responsible for the observations in (a) and (b).
7. A student stated that metals react with bases.
 (a) Support his statement with a balanced chemical equation.
 (b) What are such metals called?
 (c) Write the balanced chemical equation for the reaction of the same metal with dil. H_2SO_4
 (d) How will you test the gas evolved during both these reactions?

8. Answer the following questions based on the circuit diagram.



- Calculate (a) the total current (b) the potential difference across the 8Ω resistor
 (c) the power dissipated in the 7.2Ω resistor.

OR

- (a) Define resistivity of a wire and state its SI unit.
 (b) Calculate the resistivity of a 400cm long copper wire that has a cross-sectional area of $2cm^2$ and resistance is 2Ω .
9. A person uses spectacles of power $-4D$.
 (a) Identify the defect.
 (b) Draw the ray diagram showing the defect and its correction.

10. (a) Write the chemical formula of potassium carbonate.
(b) Name the acid and base from which it is made.
(c) With respect to strength what type of acid and base are they?
(d) What is the chemical nature of the salt?

OR

- (a) "X" is a compound used for softening the hard water. Write the chemical formula of "X".
(b) What type of salt is "X"?
(c) What happens when "X" is heated?
(d) Name the acid and base used to obtain compound "X".
(e) What is the chemical nature of the salt?
11. "M" is a reddish brown metal, Curd should not be stored in the container made out of this metal.
(a) Identify "M".
(b) Give reason as to why curd should not be stored in "M".
(c) List the steps of obtaining metal "M" from its concentrated ore with necessary equations.
12. (a) Which type of receptor will help in detecting taste? How does this information travel along a neuron and across two neurons?
(b) What is the need for chemical co-ordination in the presence of nervous system?
13. How did Mendel prove that traits can be dominant or recessive?

OR

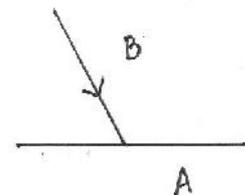
How did Mendel prove that traits are independently inherited?

14. Taking a current example, show that dissimilar looking structures evolve from a common ancestral design.
15. Government has fixed the marriageable age at 18 and 21 for girls and boys respectively. Give two reasons behind this decision. What are the two advantages of using contraceptives? Why is there an imbalance in the sex ratio in society?
16. (a) Define the following terms for a spherical mirror : (i) pole (ii) aperture
(b) Draw the ray diagram showing the use of a spherical mirror as a shaving mirror.
(c) An object of size 5cm is placed 25cm from the pole of a convex mirror of radius of curvature 30cm. calculate the position and size of the image. What will be the nature of the image?

OR

- (a) State the laws of refraction of light.
(b) The speed of light in medium A is 2.5×10^8 m/s and in medium B is 2×10^8 m/s.
A ray of light is entering medium A from medium B as shown.

- (i) Which of the two media is optically denser?
 (ii) Copy and complete the diagram to show the path of the refracted ray.
 (iii) Calculate the refractive index of medium A, with respect to medium B.



17. (a) Name the device which converts electrical energy to mechanical energy.
 (b) State the principle on which it works.
 (c) Explain its working with the help of a suitable diagram.
 (d) Name an appliance in which it is used.

18. Draw a neat structure of human heart and label the following.

- (a) The blood vessel that brings
 (i) oxygenated blood to the heart (ii) deoxygenated blood to the heart
 (iii) Chamber of the heart which pumps oxygenated blood to all parts of the body.
 (b) Name the artery which brings blood to the kidney.
 (c) How is the amount of water in the blood regulated by kidney?

19. Molecular mass of an organic solvent, "P" is 46u. "P" is used to remove chlorophyll from the leaf in the lab.

- (a) Identify "P".
 (b) Write the equations when "P" is oxidized.
 (i) in the presence of oxidising agent
 (ii) in the absence of oxidising agent
 (c) "P" reacts with the product formed in the reaction (b) (i) given above, which forms a fruity smelling compound.
 (i) Write the equation for the same.
 (ii) Fruity smelling compound is treated with an alkali. Name the process.
 (d) Explain the cleansing action of soap.

OR

Molecular mass of an organic solvent "P" is 46u. "P" is used to remove chlorophyll from the leaf in the lab.

- (a) "P" is treated with conc. H_2SO_4 . Write the equation for the reaction.
 (b) What is the role of conc. H_2SO_4 in the above reaction?
 (c) The product obtained in the above reaction is treated with H_2 gas.
 (i) Write the equation for the reaction.
 (ii) What is the practical application of the above reaction?
 (d) Name the homologous series to which the product obtained in case (c) (i) belongs.
 (e) Write any 2 isomers of the 6th member of the above homologous series.

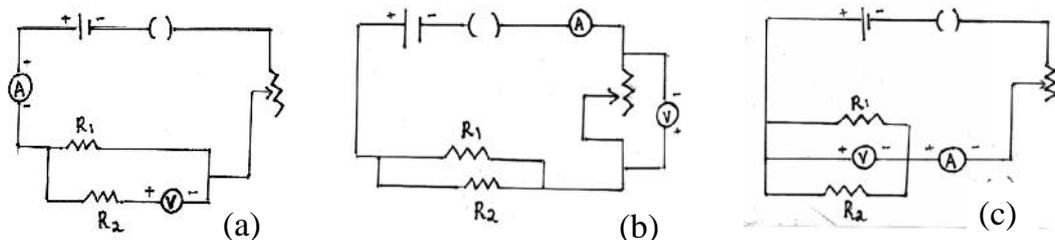
20. Study the table given below and answer the given questions by identifying the elements:

Group Period ↓	1	2	13	14	15	16	17	18
1	A							M
2	B	E	H	I	J	K	L	N
3	C	F	T	S	R	Q	P	O
4	D	G						

- (a) Identify the position of K.
 (b) Name the element with the largest radius in the period to which “K” belongs. Give reason for your answer.
 (c) What type of compound will “K” form when it reacts with (i) element “C” and (ii) element Q?
 (d) Write the chemical formulae for the compounds formed between (i) K and C (ii) K and Q.
 (e) Which one of the compound formed in the above cases (i) and (ii) will have a high M.P? Give reason for your answer.
21. (a) What would be the advantages of exploiting resources with short term aims?
 (b) How would these advantages differ from the advantages of using a long term perspective of managing resources?
 (c) How do traditional water harvesting structures ensure sustainable development?

SECTION – B

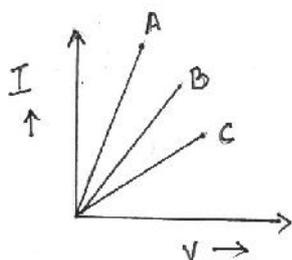
22. Three students draw the circuit diagram to find the effective resistance when two resistors are connected in parallel.



Which of these is the correct circuit diagram for the experiment? Give reasons.

OR

Study the I-V graph of three wires A, B and C to answer the following questions.



- (a) Which among the three is the best conductor? Give reasons.
- (b) If C and B are made of the same material and have equal length, which of the two is thicker?

23. You are given the solution of the following with known concentration. Arrange them in the increasing order of their p^H value.

- (a) Lemon juice , (b) gastric juice (c) lime water , (d) caustic soda
- (b) What will be the change in colour of p^H paper when tested in (i) lemon juice (ii) lime water?

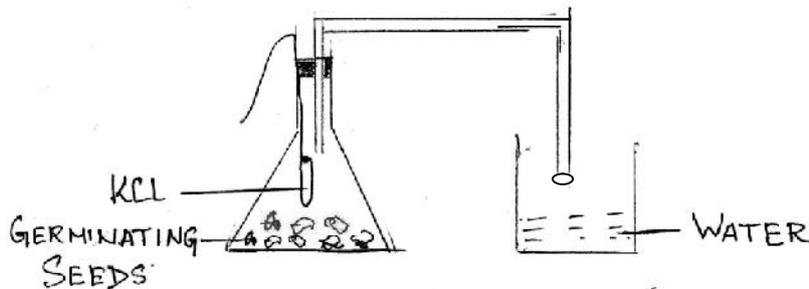
24. 5 ml of acetic acid is added to 20ml of distilled water. The mixture is stirred well in the beaker.

- (a) Which property of acetic acid is exhibited here?
- (b) When soap is added to the above mixture will it produce lather? Give reason for your answer.

25. Draw the diagram of a germinating dicot seed and label the following parts.

- (a) Part of the seed which stores food
- (b) Part of the embryo that develops into shoot

26. (a) The following set up is arranged to conduct the activity on respiration of germinating seeds. Identify the errors in the set-up.



- (b) Write the equation representing aerobic respiration.

27. Draw the ray diagram to show image formation in a convex lens when

- (a) object is placed between F and 2F
- (b) object is between F and O.

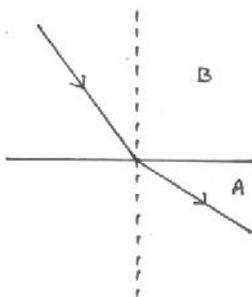
*****Best of Luck*****

General Science Answer Key Class 10 {Set 3}

SN	Value Points	Marks
1.	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> Male gamete * Smaller in size * Motile (Any one difference) </div> <div style="width: 45%;"> Female gamete * Bigger in size * Non- motile </div> </div>	1
2.	Role of guard cell- absorbs water, increases in size and creates stomatal opening	1
3.	When sunlight enters the earth's atmosphere the fine particles in air scatter the blue colour more strongly than red as blue has shorter wavelength. Clouds contain large dust particles and water droplets which scatter all wavelengths of light nearly uniformly. So clouds appear white.	1
4.	(a) $\text{Hg}(\text{OH})_2 + \text{H}_2\text{CO}_3 \rightarrow \text{HgCO}_3 \downarrow + \text{H}_2\text{O}$ (b) 2 formulae of any 2 precipitates other than given in the question.	1 $\frac{1}{2} + \frac{1}{2}$
5.	By nuclear fission.(splitting the nucleus of a heavy atom into lighter nuclei) High cost of installation, environmental contamination, limited availability of uranium (any two)	1 $\frac{1}{2}$ $\frac{1}{2}$
6.	(a) The galvanometer needle will show a momentary deflection. (b) The galvanometer needle will deflect continuously in both directions. (c) Electromagnetic induction. A changing magnetic field in a conductor induces a current in another conductor.	1 1 1
7.	(i) $\text{Zn} + 2 \text{NaOH} \rightarrow \text{Na}_2\text{ZnO}_2 + \text{H}_2$ (Any other equation) [$\frac{1}{2}$ for balancing and $\frac{1}{2}$ for equation] (ii) amphoteric metals (iii) $\text{Zn} + \text{H}_2\text{SO}_4 \rightarrow \text{ZnSO}_4 + \text{H}_2$ (iv) bring a burning splinter near the gas . it burns with a pop sound.	1 $\frac{1}{2}$ 1 $\frac{1}{2}$
8.	(a) $\frac{1}{R_p} = \frac{1}{8} + \frac{1}{12} = \frac{10}{48}$ $R_p = 4.8$; Total R = $4.8 + 7.2 = 12$ $I = 0.5\text{A}$ (b) Potential difference across 8 = $0.5 \times 4.8 = 2.4\text{V}$ (c) Power dissipated in 7.2 = $I^2 R = (0.5)^2 \times 7.2 = 1.8\text{W}$	1 $\frac{1}{2}$ $\frac{1}{2}$ 1
<u>OR</u>		1

	(a) The resistance of a conductor of unit length and unit area of cross section of a material at a certain temperature.	1/2
	Its SI unit is m	
	(b) $R = \frac{\dots l}{A}$	1/2
	... = $RA/l = 2 \times 2 \times 10^{-4} / 4 = 10^{-4}$ m or 10^{-2} cm	1
9.	(a) Myopia (Near –Sightedness)	1
	(b) Ray diagrams [NCERT Page 189 fig 11.2 (b) and (c)]	1+1
10.	(i) K_2CO_3	1/2
	(ii) Carbonic acid / H_2CO_3	1/2 + 1/2
	Potassium hydroxide / KOH	
	(iii) Weak acid , Strong base	1/2 + 1/2
	(iv) Basic salt	
	<u>OR</u>	1/2
	(i) $Na_2CO_3 \cdot 10H_2O$	1/2
	(ii) Basic	1/2
	(iii) It forms a monohydrate salt / anhydrous salt	1/2 + 1/2
	(iv) Carbonic acid / H_2CO_3 , Sodium hydroxide / NaOH	
	(v) Basic salt	1/2
11.	a) Copper	1/2
	b) Copper reacts with oxygen, moisture , carbon di oxide to form green colour compound / basic cupric carbonate	1/2
	c) $2Cu_2S + 3O_2 \rightarrow 2Cu_2O + 2SO_2$	
	$Cu_2S + 2Cu_2O \rightarrow 6Cu + SO_2$	
	(1/2 mark for each equation and 1/2 mark for balancing)	1/2 × 4
12.	a) Gustatory receptor	1/2
	Along the neuron as an electrical impulse	1/2
	Across two neurons- neuron with the help of neurotransmitters impulse moves from axon endings of one neuron to the dendrites of the next	1
	b) * Reach all the cells of the body	1
	* Prolonged response to stimulus	

13. Show monohybrid cross 1
 F1 generation- dominant trait is seen in heterozygous condition ½
 F2 generation – 3:1 ratio of the two phenotypes
 Conclusion – out of the pair of contrasting characteristics, one is dominant over the other ½
 1
- OR**
- Show dihybrid cross 1
 F2 generation – new combination of variants; ratio 9:3:3:1 ½ + ½
 Conclusion – since two new combinations of traits are seen in F2 generation, it shows that traits are inherited independently. 1
14. Wild Cabbage- Artificial Selection [any other correct example] ½
 Selection of any two traits with proper mention of traits 2
 Conclusion ½
15. Any two * Mental maturity/ Emotional maturity / * Financial independence to handle the responsibilities ½ + ½
- Any two
 * Restriction of family size/ * Spacing between siblings/ * Avoid unwanted pregnancy 1
- Sex ratio: preference for male child leading to female foeticide/ infanticide 1
16. (a) i) Pole : the midpoint of a spherical mirror ½
 ii) Aperture: The diameter of the reflecting surface of a spherical mirror. ½
 (b) Ray diagram [NCERT page 166 , fig 10.7 (f)] 1
 (c) $h = +5\text{cm}$, $u = -25\text{cm}$, $f = R/2 = 15\text{cm}$
 $1/v + 1/u = 1/f$ or $1/v = 1/f - 1/u = 1/15 - 1/-25$ 1
 Or $1/v = 8/75$; $v = 75/8 = 9.375\text{cm}$ ½
 $h' = -vh/u = -9.375 \times 5 / -25 = 1.875\text{cm}$ 1
 Image is virtual and erect. ½
- OR**
- (a) i) The incident ray, refracted ray and the normal to the interface of two transparent media at the point of incidence, all lie in the same plane. 1
 ii) The ratio of sine of angle of incidence to the sine of angle of refraction is constant for the light of a given colour and for the given pair of media. 1
 (b) i) B 1



ii) fig showing refracted ray bending away from the normal.

iii) $n_{AB} = 2 \times 10^8 / 2.5 \times 10^8 = 0.8$

17. (a) Motor 1/2
- (b) A current carrying conductor experiences a mechanical force in a magnetic field. 1
- (c) [NCERT page 232 fig 13.15] 1
 For working,
 A mechanical force acts in opposite directions in arms AB and CD according to Fleming's left hand rule. So the coil rotates anticlockwise. After half rotation the arms interchange their positions. The direction of current is reversed every half rotation by the split ring(commutator). Hence the motor continues rotating in the same direction. 2
- (d) Any appliance. 1/2
18. Structure of heart [Fig. 6.10 Pg No. 106 NCERT Science Textbook] 2
- a) Label- pulmonary vein, venacava, left ventricle 1/2 + 1/2
+ 1/2
- b) Renal Artery 1/2
 Water regulation by kidney- selective reabsorption of water in nephric tubule depending on the quantity of nitrogenous wastes in blood and amount of excess water in the body 1
19. (a) Alcohol / Ethanol/Ethyl alcohol 1/2
- (b) (i)
$$C_2H_5OH + (O) \xrightarrow[\Delta]{\text{alk. KMnO}_4 / \text{Acidified K}_2\text{Cr}_2\text{O}_7} CH_3COOH + H_2O$$
 1
- (ii) $C_2H_5OH + O_2 \rightarrow CO_2 + H_2O$
- (c) (i) $C_2H_5OH + CH_3COOH \rightarrow CH_3COOC_2H_5 + H_2O$

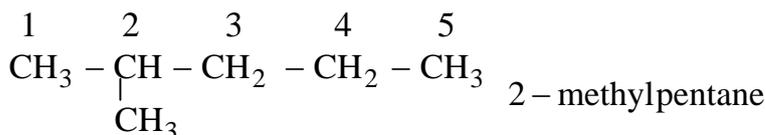
- (ii) Saponification reaction 1/2
 d) Hydrophobic end attaches to dirt. Hydrophilic end will be in water. 1/2
 They form the micelle remaining dirt will be removed by agitation 1

OR

- (a) $C_2H_5OH \xrightarrow{\text{Conc. } H_2SO_4} CH_2 = CH_2 + H_2O$ 1
 b) Dehydrating agent 1/2
 c) (i) $CH_2 = CH_2 + H_2 \xrightarrow{Ni / Pd + \Delta} CH_3 - CH_3$ 1
 (Condition 1/2 + equation 1/2)
 (ii) Hydrogenation of oils 1/2
 (d) Alkanes 1/2
 (e) 6th member of alkanes is C_6H_{14} 1/2
 2 isomers (1 mark each isomer)



n-hexane



(or any other structures)

- 20.** (a) Group 16 , period 2 1/2 + 1/2
 (b) B , Atomic size decreases from left to right across the period. 1/2 + 1/2
 (c) (i) Ionic (ii) Covalent 1/2 + 1/2
 (d) Na_2O , SO_2 1/2 + 1/2
 (e) Na_2O , Ionic compound 1/2 + 1/2
- 21.** a) * Faster economic growth 1
 * Availability of resources for developmental activities
 b) Any two * Equitable distribution of resources- social equality / 2
 * Resources available for future generations /
 * Lesser environmental degradation /
 * Sustainable development
 c) Any two
 * Recharge of ground water ensures continuous availability of water /
 * Amicable sharing of water / 2
 * Will not cause ecological imbalance /
 * Avoids mismanagement and overexploitation of resources

SECTION – B

22. Fig (c) .only in this figure the voltmeter will measure the potential difference of the resistors in parallel. 1+1
- OR**
- (a) A, least resistance 1
(b) B. 1
23. (a) Gastric juice lemon juice lime water caustic soda 1
(b) Red/orange ½
(c) Blue / purple ½
(* No marks to be awarded if **ALL** the samples are not in order)
24. (a) Miscibility ½
(b) Yes. ½
(c) As presence of acetic acid does not make the water hard. 1
25. Structure of seed- Fig 8.9 Pg No. 135 in NCERT Science textbook 1
i) Cotyledon ii) Plumule ½ + ½
26. a) Errors- * Bent tube not inserted completely in beaker containing water ½
* Micro test tube does not have substance that can absorb carbon dioxide like KOH ½
b) $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$ 1
27. (a) Ray diagram [NCERT page 180,fig 10.16 (d)] 1
(b) Ray diagram [NCERT page 181,fig 10.16 (f)] 1
