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FOR KARNATAKA CLASS 10 PREPARATION

# Karnataka SSLC Model Question Paper 2027 for Science (Paper 4, English Medium) Key Answers

| EXAM | YEAR | TYPE | SUBJECT |
| --- | --- | --- | --- |
| Karnataka Class 10 | 2027 | Answer Key | Science |

# ಕರ್ನಾಟಕ ಶಾಲಾ ಪರೀಕ್ಷೆ ಮತ್ತು ಮೌಲ್ಯನಿರ್ಣಯ ಮಂಡಲಿ

ಮಲ್ಲೇಶ್ವರಂ, ಬೆಂಗಳೂರು – 560 003

**KARNATAKA SCHOOL EXAMINATION AND ASSESSMENT BOARD**
**Malleshwaram, Bengaluru - 560 003**

2026–27 ರ ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ. ಮಾದರಿ ಪ್ರಶ್ನೆಪತ್ರಿಕೆ – 4

## S.S.L.C. MODEL QUESTION PAPER – 4 : 2026-27

ಮಾದರಿ ಉತ್ತರಗಳು

**MODEL ANSWERS**

ಸಂಕೇತ ಸಂಖ್ಯೆ : **83-E** **Code No. : 83-E**

ವಿಷಯ : **ವಿಜ್ಞಾನ**

## Subject: SCIENCE

(ಭೌತ ವಿಜ್ಞಾನ, ರಸಾಯನ ವಿಜ್ಞಾನ ಮತ್ತು ಜೀವ ವಿಜ್ಞಾನ / **Physics, Chemistry and Biology**)

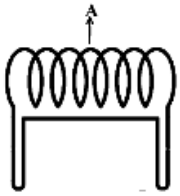
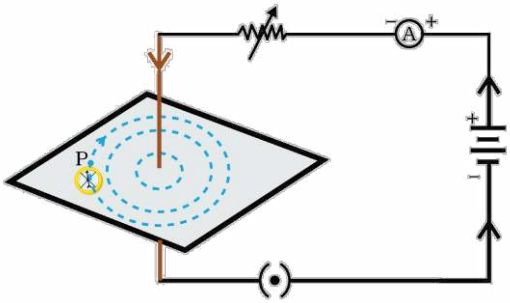
(ಆಂಗ್ಲ ಮಾಧ್ಯಮ / **English Medium**)

(ಭೌತ ವಿಜ್ಞಾನ / **Physics**)

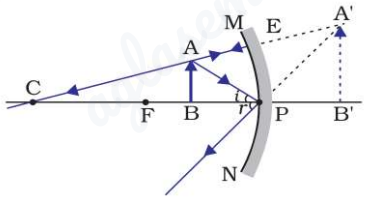
[Max. Marks: 80

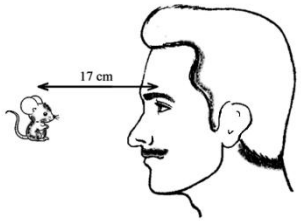
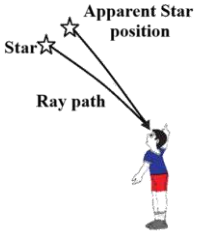
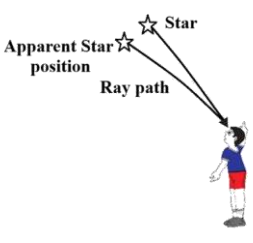
| Q.No. | Value Points | Total |
|---|---|---|
| | **Part - A** | |
| | **( Physics )** | |
| **I.** | **Multiple-choice questions:** **2 x 1 = 2** | |
| 1. | The device used to measure the rate of current in a circuit is<br>(A) ammeter (B) voltmeter<br>(C) rheostat (D) battery<br>***Answer:***<br>(A) ammeter | 1 |
| 2. | If the power of the lens prescribed by the ophthalmologist for vision correction is +2D then, the focal length of that lens is<br>(A) 2m (B) 0.2m<br>(C) 0.50m (D) 5m<br>***Answer:***<br>(C] 0.50m | 1 |
| **II.** | **Answer the following questions:** **2 x 1 = 2** | |
| 3. | What effect will happen if the fuse is not installed in a domestic electric circuit?<br>***Answer:***<br>♦ Causes short circuit / overload/heating of wires/damage of electrical 1 | 1 |

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| Q.No. | Value Points | | Total |
|---|---|---|---|
| | appliances | | |
| 4. | Observe the picture given below. Mention the two measures that can be followed to produce magnetic field lines around the coil A.   | | |
| | ***Answer:*** | | |
| | ♦ Connecting cell / battery in the circuit. | ½ | |
| | ♦ Soft iron placed inside the coil A. | ½ | 1 |
| **III.** | **Answer the following questions :** **3 x 2 = 6** | | |
| 5. | Write any two differences between near-sightedness (myopia) and far-sightedness (hypermetropia). | | |
| | ***Answer:*** | | |
| | ***Near-sightedness (myopia)*** / ***Far-sightedness (hypermetropia)*** | | |
| | ♦ Can see nearby objects clearly / cannot see distant objects distinctly. / ♦ Can see distant objects clearly / cannot see nearby objects distinctly. | | |
| | ♦ The image of a distant object is formed in front of the retina. / ♦ The image of a nearby object is formed behind the retina. | | |
| | ♦ The fat point is nearer than infinity. / ♦ The near point is farther away from the normal. | | |
| | ♦ The focal length of the eyeball is too short / the eyeball elongates. / ♦ The focal length of the eyeball is too long / the eyeball becomes too small. | | |
| | ♦ This defect can be corrected by using a concave lens of suitable power. / ♦ This defect can be corrected by using a convex lens of suitable power. | | |
| | (Any two) | 1+1 | 2 |
| 6. | Draw the diagram indicating the magnetic field lines formed around the current carrying straight wire. | | |
| | ***Answer:***   | | |
| | For diagram - | | 2 |

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| Q.No. | Value Points | | Total |
|---|---|---|---|
| 7. | 'In domestic electric circuits connecting electrical devices in parallel is a better practice '. Give four reasons for this practice.<br>***Answer:***<br>♦ A parallel circuit divides the current through the electrical gadgets.<br>♦ When one component fails, the circuit will not break. The other components work.<br>♦ The total resistance is less in this circuit.<br>♦ More helpful in cases of different current is required for different electrical appliances.<br>♦ Can be controlled by many switches.<br>(Any four) | 4x½ | 2 |
| **IV.** | **Answer the following questions :** | **3 x 3 = 9** | |
| 8. | Draw the ray diagram to show the image formation when an object is kept between 'F' and 'P' of a concave mirror. Write the nature and position of the image formed.<br>[F = Principal focus and P = Pole of the mirror]<br>***Answer:***<br><br><br>For drawing mirror and labelled principal axis -<br>Drawing correct positions of object and image -<br>Writing nature and position of image formed - | 1<br>1<br>½+½ | 3 |
| 9. | Explain an experiment to demonstrate that a current carrying conductor placed in a magnetic field experiences a force.<br>**OR**<br>Explain an activity to draw the magnetic field lines around a bar magnet using a compass needle.<br>***Answer:***<br>♦ Take a small aluminium rod. Using two connecting wires suspend it horizontally from a stand.<br>♦ Take a horseshoe magnet and place the aluminium rod in between the north and south pole of this magnet.<br>♦ Connect the aluminium rod in series to a battery, a key and a rheostat.<br>♦ Now pass the current through the conducting wire, then the rod displaces towards the left.<br>♦ If the direction of the current is reversed then the rod displaces | ½<br>½<br>½<br>½ | |

| Q.No. | Value Points | | Total |
|---|---|---|---|
| | towards the right. | ½ | |
| | ♦ If the direction of the magnetic field is reversed then the aluminium rod displaces again towards the left. | ½ | |
| | The reason for the displacement of the rod is that it experiences a force. | | |
| | **OR** | | |
| | ♦ Fix a white paper on a board and place a bar magnet in the middle. | ½ | . |
| | ♦ Now place the magnetic needle close to the north pole of the bar magnet. | ½ | |
| | ♦ Then the south pole of the compass needle will point to the north pole of the magnet. | ½ | |
| | ♦ Now put a dot mark on the paper in the direction pointed by the north pole of the compass needle. | ½ | |
| | ♦ The compass needle is now to be placed where its south pole points the dot. | ½ | |
| | ♦ Now put a dot mark on the paper in the new direction pointed by the north pole of the compass needle. | ½ | |
| | Repeat the steps till the compass reaches the south pole of the bar magnet. | | |
| | If all these dots are joined, then we obtain a magnetic field line of the bar magnet. | | 3 |
| 10. | The below figure is showing the distance between the human eye having normal vision and a mouse. Overview the picture and answer to the question given. | | |
| |   | | |
| | Is the mouse clearly visible to the human eye here? Justify your answer with a suitable reason. What is the function of the lens in the human eye? | | |
| | **OR** | | |
| | Observe the pictures given below. | | |
| |   Situation - 1 | | |
| |   Situation - 2 | | |

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| Q.No. | Value Points | | Total |
|---|---|---|---|
| | i) Which situation is correctly indicating the apparent position of the star? Why?<br>ii) What is the reason for the change in the apparent position of the star? | 1 | |
| | ***Answer:***<br>♦ No<br>♦ The distance between human eye and mouse is less than 25cm. / The distance between human eye and mouse is below the least distance of distinct vision.<br>♦ The eye lens forms an inverted real image of the object on the retina. / The lens provides the finest adjustment of focal length required to focus objects at different distances on the retina. | 1<br>1<br>1 | |
| | **OR** | | |
| | i) ♦ Situation – 1<br>♦ The star appears slightly higher than its actual position when viewed near the horizon.<br>ii) Atmospheric refraction of the starlight. | 1<br>1 | 3 |
| **V.** | **Answer the following questions :** **2 x 4 = 8** | | |
| 11. | a) Define 1 dioptre. Write the formula used to calculate the magnification of the image formed by a mirror.<br>b) State the laws of refraction of light. | | |
| | ***Answer:***<br>a) ♦ The power of a lens of focal length 1 meter is called 1 dioptre.<br>♦ $m = \frac{h'}{h}$ $OR$ $m = \frac{v}{u}$<br>b) ♦ The incident ray, the refracted ray and the normal to the interface of two transparent media at the point of incidence, all lie in the same plane.<br>♦ The ratio of sine of angle of incidence to the sine of angle of refraction is a constant, for the light of a given colour and for the given pair of media OR $\frac{\sin i}{\sin r} = Constant$ | 1<br>1<br>1<br>1 | 4 |
| 12. | An electric heater connected to a 220V generator draws a current of 10A. What is the power of the electric heater? If this electric heater is used for 8 hours a day, then calculate the total cost of using it for 30 days at Rs. 5.00 per 1 kWh. | | |
| | **OR** | | |
| | The resistance of a metal wire of length 2m is 28Ω at 20°C. If the diameter of | | |

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| Q.No. | Value Points | | Total |
|---|---|---|---|
| | the wire is 0.04mm, then calculate the resistivity of the metal at that temperature. | | |
| | ***Answer:*** | | |
| | V = 220V | P = VI | ½ |
| | I = 10A | P = 220 x 10 = 2200W = 2.2kW | 1 |
| | P = ? | | |
| | E = ? | Total energy consumed by the electric heater in 30 days: | |
| | | = 2.2kW x 8 hours x 30 days | ½ |
| | | = 528 kWh | ½ |
| | | The cost of energy to operate the electric heater: | |
| | | = 528 x Rs. 5 | ½ |
| | | = 2640 Rs. | 1 |
| | | **OR** | |
| | R = 28Ω | $r = \frac{d}{2}$ | ½ |
| | d = 0.04 mm | $r = \frac{0.04}{2} = 0.02\ mm = 2\ x\ 10^{-5}$ | ½ |
| | $l$ = 2m | $A = \pi r^2$ | ½ |
| | ρ = ? | $A = 3.14 \times (2 \times 10^{-5})^2$ | ½ |
| | | $A = 12.56 \times 10^{-10}\ m^2$ | ½ |
| | | $R = \frac{\rho l}{A}$ | |
| | | $\rho = \frac{RA}{l}$ | ½ |
| | | $R = \frac{28\ x\ 12.56\ x\ 10^{-10}}{2} = 175.8 \times 10^{-10}\ \Omega m$ | ½ |
| | | $R = 1.758\ x\ 10^{-8}\ \Omega m$ | ½ |
| | | | 4 |

**83-E**



# ಕರ್ನಾಟಕ ಶಾಲಾ ಪರೀಕ್ಷೆ ಮತ್ತು ಮೌಲ್ಯನಿರ್ಣಯ ಮಂಡಲಿ

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**S.S.L.C. MODEL QUESTION PAPER – 4 : 2026-27**

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**MODEL ANSWERS**

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ವಿಷಯ : **ವಿಜ್ಞಾನ**

**Subject: SCIENCE**

(ಭೌತ ವಿಜ್ಞಾನ, ರಸಾಯನ ವಿಜ್ಞಾನ ಮತ್ತು ಜೀವ ವಿಜ್ಞಾನ / **Physics, Chemistry and Biology**)

(ಆಂಗ್ಲ ಮಾಧ್ಯಮ / **English Medium**)

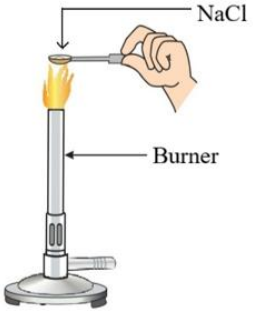
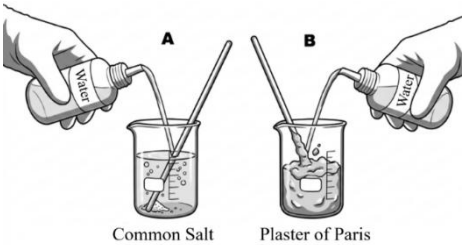
(ರಸಾಯನ ವಿಜ್ಞಾನ / **Chemistry**)

[Max. Marks: 80

| Q.No. | Value Points | Total |
|---|---|---|
| | **Part - A** | |
| | **( Physics )** | |
| **VI.** | **Multiple-choice questions:** **3 x 1 = 3** | |
| 13. | The range of pH values of different acids is<br>(A) 0 - less than 7 (B) 2 - 12<br>(C) 7 - 14 (D) 12 - 14<br>***Answer:*** (A) 0 - less than 7 | 1 |
| 14. | Organic compounds obtained by the reaction between carboxylic acid and alcohol are<br>(A) aldehydes (B) ketones<br>(C) esters (D) haloalkanes<br>***Answer:*** (C) esters | 1 |
| 15. | The list of Alloys that have different constituents is given in the table below. By observing it, an alloy that has a low melting point among these is | |

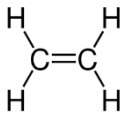
| Components | Alloy |
|---|---|
| Fe, Ni, and Cr | p |
| Cu and Zn | q |
| Cu and Sn | r |
| Pb and Sn | s |

**83-E** 

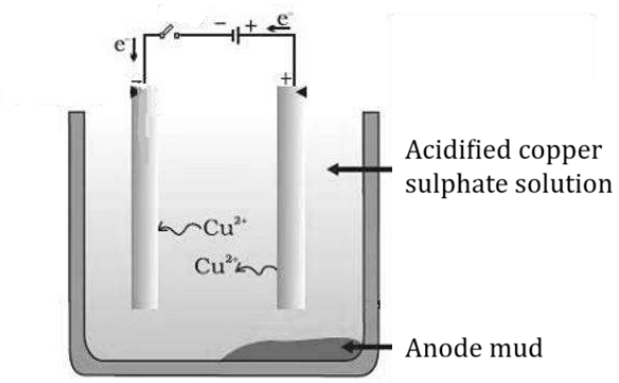
| Q.No. | Value Points | Total |
|---|---|---|
| | (A) p (B) q<br>(C) r (D) s<br>***Answer:***<br>(D) s | 1 |
| **VII.** | **Answer the following questions :** **3 x 1 = 3** | |
| 16. | What is the reason for the formation of reddish-brown coloured coating on iron objects?<br>***Answer:*** Corrosion | 1 |
| 17. | The molecular formulae of three carbon compounds that are in homologous series are $C_2H_6$, $C_3H_8$ and $C_4H_{10}$. Then write the general formula of this homologous series.<br>***Answer:*** $C_nH_{2n+2}$ | 1 |
| 18. | Analyse the activity carefully that is expressed in the figure below. From this activity, how can NaCl be considered as an ionic compound?<br><br><br>***Answer:***<br>♦ Sodium chloride does not melt easily/ sodium chloride has high melting point<br>♦ Generally ionic compounds have high melting points. | 1 |
| **VIII.** | **Answer the following questions :** **3 x 2 = 6** | |
| 19. | In the given below image, water is added to both of the beaker 'A' having common salt and the beaker 'B' having plaster of paris. The solution of which beaker turns into solid form? Justify your answer with a chemical equation.<br><br><br>***Answer:*** 1<br>♦ Beaker B solution 1<br>♦ $CaSO_4 . ½H_2O + 1½H_2O \rightarrow CaSO_4 . 2H_2O$ | 2 |

**83-E**

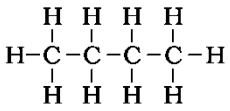
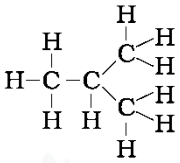


| Q.No. | Value Points | | Total |
|---|---|---|---|
| 20. | The ratio of carbon and hydrogen atoms in a particular group of unsaturated hydrocarbons is 1 : 2. However, a molecule of $CH_2$ in the same proportion cannot be the first member of this group of hydrocarbons. What is the reason for this? Write the structural formula of the first member of this hydrocarbon group. | | |
| | **OR** | | |
| | Carbon compounds are found in extremely large numbers in nature. Why? Clarify. | | |
| | ***Answer:*** | | |
| | ♦ The $CH_2$ molecule does not have a double bond between two carbon atoms. / Between carbon and hydrogen atoms in $CH_2$ molecule the electrons are not shared to satisfy a stable configuration. | 1 | |
| | ♦  | 1 | |
| | | | 2 |
| 21. | Which physical properties of the metals are used in the following situations? | | |
| | i) Gold is used in making jewellery. | | |
| | ii) Nickel is used in guitar strings. | | |
| | ***Answer:*** | | |
| | i) Lustrous / Hard / Malleability / Ductility (Any two) | 1 | |
| | ii) Ductility and Sonorous | 1 | 2 |
| **IX.** | **Answer the following questions :** **3 x 3 = 9** | | |
| 22. | Balance the following chemical equations | | |
| | i) $Na + O_2 \rightarrow Na_2O$ | | |
| | ii) $Mg + HCl \rightarrow MgCl_2 + H_2$ | | |
| | iii) $N_2 + H_2 \rightarrow NH_3$ | | |
| | **OR** | | |
| | a) Write the types of chemical reactions given below. | | |
| | i) $ZnCO_3 \rightarrow ZnO + CO_2$ | | |
| | ii) $H_2 + Cl_2 \rightarrow 2HCl$ | | |
| | b) Are reactions expressed in equations 'i)' and 'ii)' opposite to each other? Justify your answer with a suitable reason. | | |
| | ***Answer:*** | | |
| | i) $4Na + O_2 \rightarrow 2Na_2O$ | 1 | |
| | ii) $Mg + 2HCl \rightarrow MgCl_2 + H_2$ | 1 | |
| | iii) $N_2 + 3H_2 \rightarrow 2NH_3$ | 1 | |
| | **OR** | | |

**83-E** 

| Q.No. | Value Points | | Total |
|---|---|---|---|
| | a) i) Decomposition reaction ½ | | |
| | ii) Combination reaction ½ | | |
| | b) ♦ Yes 1 | | |
| | ♦ In a decomposition reaction, one reactant produces two products. ½ | | |
| | ♦ In a combination reaction, two reactants combine to produce a single product. ½ | | 3 |
| 23. | Read the information below and answer the questions given: | | |
| | • The liquid waste emitted by the factories may contain high amounts of hydrochloric acid sometimes. | | |
| | • It is dangerous to discharge this waste water to the water sources. | | |
| | i) Which type of chemical process must be carried out before letting these wastes to the water sources? Represent this process by a general word equation. | | |
| | ii) Mention the role of bleaching powder in the treatment of impure water. | | |
| | ***Answer:*** | | |
| | i) ♦ Neutralisation reaction 1 | | |
| | ♦ Acid + Base → Salt + Water 1 | | |
| | ii) Bleaching powder makes water free from germs/ acts as disinfectant/ removes bad smells from the impure water as an oxidising agent. 1 | | 3 |
| 24. | Draw the diagram to show the arrangement of the apparatus used in the electrolytic refining of copper. Label the following parts. | | |
| | i) Anode mud ii) Acidified copper sulphate solution | | |
| | ***Answer:*** | | |
| |   | | |
| | For diagram – 2 | | |
| | Parts – ½+½ | | 3 |

**83-E** - 11 -

| Q.No. | Value Points | Total |
|---|---|---|
| X. | **Answer the following questions :** **1 x 4 = 4**<br>a) The conversion of ethanol to ethanoic acid is an oxidation reaction. Why?<br>b) What are structural isomers? Write the structural isomers of butane.<br>**OR**<br>a) Explain the mechanism of cleaning action of soaps.<br>b) Which are the salts responsible for the hardness of water? Detergents are effective even in hard water. Why?<br>***Answer:***<br>a) Ethanol loses hydrogen and gains oxygen from the oxidising agents during this conversion. 1<br>b) Carbon compounds having the same molecular formula but have different structures are called structural isomers. 1<br> n-butane  isobutane 1+1<br>**OR**<br>a)<br>♦ The molecules of soap have hydrophilic / non-ionic end and hydrophobic / ionic end. ½<br>♦ The Ionic end of soap interacts with water while the carbon chain interacts with oil. ½<br>♦ Soap molecules thus form a structure called micelle. ½<br>♦ One end of the molecules is towards the oil droplet while the ionic-end faces outside. ½<br>The micelles thus help in pulling out the dirt in water.<br>b)<br>♦ Salts of calcium and magnesium. 1<br>♦ Detergents do not form water insoluble precipitate in hard water. 1 | 4 |

**83-E**



# ಕರ್ನಾಟಕ ಶಾಲಾ ಪರೀಕ್ಷೆ ಮತ್ತು ಮೌಲ್ಯನಿರ್ಣಯ ಮಂಡಲಿ

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**S.S.L.C. MODEL QUESTION PAPER – 4 : 2026-27**

ಮಾದರಿ ಉತ್ತರಗಳು

**MODEL ANSWERS**

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ವಿಷಯ : **ವಿಜ್ಞಾನ**

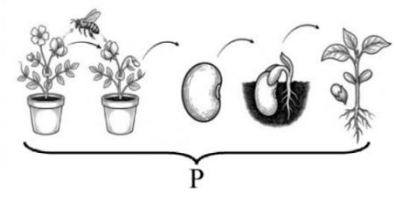
**Subject: SCIENCE**

(ಭೌತ ವಿಜ್ಞಾನ, ರಸಾಯನ ವಿಜ್ಞಾನ ಮತ್ತು ಜೀವ ವಿಜ್ಞಾನ / **Physics, Chemistry and Biology**)

(ಆಂಗ್ಲ ಮಾಧ್ಯಮ / **English Medium**)

(ಜೀವ ವಿಜ್ಞಾನ / **Biology**)

[Max. Marks: 80

| Q.No. | Value Points | Total |
|---|---|---|
| | **Part - C** | |
| | **( Biology )** | |
| **XI.** | **Multiple-choice questions:** **3 x 1 = 3** | |
| 26. | An enzyme that is secreted by the pancreas to digest protein is<br>(A) Amylase (B) Pepsin<br>(C) Trypsin (D) Lipase<br>***Answer:*** (C) Trypsin | 1 |
| 27. | The process that occurs in the production of new individuals of planaria is<br>(A) Binary fission (B) Regeneration<br>(C) Budding (D) Fragmentation<br>***Answer:*** (B) Regeneration | 1 |
| 28. | Observe the reproductive processes depicted through below P and Q figures.<br>A correct statement related to these processes among the following is<br><br>P<br><br>Q | . |

**83-E** 

| Q.No. | Value Points | Total |
|---|---|---|
| | (A) The offsprings produced in the process P are completely as similar to the parent plants.<br>(B) The offsprings produced in the process Q have variations.<br>(C) Offsprings produced in both of the processes will have 50% similarities with parent organisms.<br>(D) The organisms produced in the process P show more variations.<br>***Answer:***<br>(D) The organisms produced in the process P show more variations. | 1 |
| **XII.** | **Answer the following questions :** **3 x 1 = 3** | |
| 29. | What is geotropism?<br>***Answer:***<br>The movement of plant parts in response to gravity/ to the earth is called geotropism. | 1 |
| 30. | Using contraceptive pills and the use of condom on the penis both are contraceptive methods. Which among these methods is helpful in controlling sexually transmitting diseases?<br>***Answer:***<br>The use of condom on the penis | 1 |
| 31. | The amount of haemoglobin content in the blood of two persons 'A' and 'B' is found to be 9gm/dl and 13gm/dl. Which statement among the following is correct regarding the oxygen supply in their body?<br>i) Oxygen supply is more in person 'B' than in 'A' person.<br>ii) Oxygen supply is more in the person 'A' than in 'B' person<br>***Answer:***<br>i) Oxygen supply is more in person 'B' than in 'A' person. | 1 |
| **XIII.** | **Answer the following questions :** **2 x 2 = 4** | |
| 32. | How do we detect the smell of an ignited incense stick (Agarabatti)?<br>**OR**<br>Name the glands that secrete the following hormones and mention the functions of these hormones.<br>i) Insulin<br>ii) Thyroxine<br>***Answer:***<br>♦ The smell of incense is diffused in the air and is detected by the olfactory receptors in the nose. ½<br>♦ This information reaches the forebrain through sensory neurons. ½<br>♦ A specific area of the forebrain is specialized for perceiving odour information. ½ | |

| Q.No. | Value Points | | Total |
|---|---|---|---|
| | ♦ The association area here combines this information with information already stored in the brain and interprets it. | ½ | |
| | **OR** | | |
| | i) ♦ Pancreas | ½ | |
| | ♦ Controls blood sugar level. | ½ | |
| | ii) ♦ Thyroid | ½ | 2 |
| | ♦ Controls carbohydrates, proteins and fats metabolism. | ½ | |
| 33. | On a very hot summer day, a person drinks a lot of water but notices, he produces a small amount of concentrated urine. How is this process related to the reabsorption process that takes place in the nephron tube? | | |
| | ***Answer:*** The amount of water reabsorbed in the tubular part of nephron depends on the following factors: | | |
| | ♦ The amount of excess water in the body. | 1 | |
| | ♦ The amount of dissolved wastes that need to be excreted. | 1 | 2 |
| **XIV.** | **Answer the following questions :** **3 x 3 = 9** | | |
| 34. | What are producers, consumers and decomposers in the environment? Give an example for each. | | |
| | **OR** | | |
| | a) Define the following. | | |
| | i) Food chain | | |
| | ii) Biological magnification | | |
| | b) Mention the function of ozone. | | |
| | ***Answer:*** | | |
| | Producers: | | |
| | ♦ Organisms that prepare their own food through photosynthesis. | ½ | |
| | ♦ Example: Plants / Certain bacteria. | ½ | |
| | Consumers: | | |
| | ♦ Organisms that depend on other organisms for food directly or indirectly. | ½ | |
| | ♦ Example: Animals | ½ | |
| | Decomposers: | | |
| | ♦ Microorganisms that break-down the complex organic substances (wastes) into simple inorganic substances. / Microorganisms that feed on dead parts of plants and animals and play a key role in decaying and recycling of these wastes. | ½ | |
| | ♦ Example: Bacteria / fungi | ½ | |

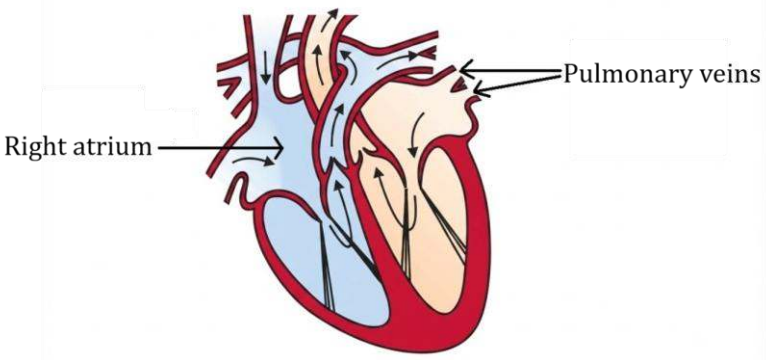
**83-E** 

| Q.No. | Value Points | | Total |
|---|---|---|---|
| | **OR** | | |
| | a) i) Food chain is a series of organisms taking part at various tropic levels. / A representation that shows the interdependence between different types of tropic levels of the environment to get food and energy. | 1 | |
| | ii) Biomagnification is the phenomenon where certain harmful non-degradable chemicals accumulated progressively at each trophic level in a food chain. | 1 | |
| | b) Ozone layer shields the surface of the earth from ultraviolet radiation from the sun. | 1 | 3 |
| 35. | a) Red flowers producing pea plant (RR) is crossed with white flowers producing pea plant (rr). Show the result obtained in the $F_2$ generation with the help of a checkerboard. | | |
| | b) How is the sex of the male child in humans determined? | | |
| | ***Answer:*** | | |
| | a) | | |

| $F_2$ generation | R | r |
|---|---|---|
| R | RR | Rr |
| r | Rr | rr |

| | | |
|---|---|---|
| | | 2 |
| | b) If egg gets Y chromosomes from father then the zygote develops into male child. | 1 | 3 |
| 36. | A person who met with an accident experiences the heat of a cup that has hot tea by a touch but fails to withdraw the hand immediately by itself. | | |
| | i) Which neuron of the reflex arc is probably damaged? Justify your answer. | | |
| | ii) Which part of the human nervous system brings control during the situation mentioned above? | | |
| | ***Answer:*** | | |
| | i) ♦ Motor neuron | 1 | |
| | ♦ As the person experiences the sensation of touch, sensory neuron and relay neurons are functioning. | ½ | |
| | ♦ Since the motor neurons are damaged, the information is not reaching the muscles to give a response. | ½ | |
| | ii) The Spinal cord | 1 | 3 |

**83-E** 

| Q.No. | Value Points | | Total |
|---|---|---|---|
| **XV.** | **Answer the following questions :** **1 x 4 = 4** | | |
| 37. | Draw the diagram showing the sectional view of the human heart. Label the following parts:<br>i) Right atrium<br>ii) Pulmonary veins<br>***Answer:***<br><br><br>For diagram – 3<br>For parts – ½+½ | | 4 |
| **XVI.** | **Answer the following questions :** **1 x 5 = 5** | | |
| 38. | a) Growth of thread like structures along with the gradual spoilage of tomato is observed on a cut tomato after a few days. Mention the reasons for this change.<br>b) The testicles are located outside the abdomen in the scrotum in men. Why?<br>c) How does the number of chromosomes reestablish in sexual reproduction?<br>**OR**<br>a) How does a fertilized egg develop into an embryo in the uterus of female? How does this embryo get nourishment in the mother's womb? Explain.<br>b) How does a seed grow into a future plant?<br>***Answer:***<br>a) | | |
| | ♦ The thread like structures that grow on the tomato are hyphae of Rhizopus (Bread mould) | ½ | |
| | ♦ They have blob- like structures called sporangia. Sporangia contain reproductive structures called spores. | ½ | |
| | ♦ When spores come into contact with the moist surface, they begin to grow. | ½ | |
| | ♦ Therefore, the cut tomato gets spoiled gradually. | ½ | |

| Q.No. | Value Points | | Total |
|---|---|---|---|
| | b) Sperm production requires a temperature lower than body temperature. | 1 | |
| | c) | | |
| | ♦ Gametes receive half the number of chromosomes as a result of meiotic cell division. | 1 | |
| | ♦ During sexual reproduction, the male and female gametes fuse to form zygote and the number of chromosomes reestablish. | 1 | |
| | **OR** | | |
| | a) | | |
| | ♦ The zygote divides and becomes an embryo. | ½ | |
| | ♦ The embryo is implanted in the lining of the uterus. | ½ | |
| | ♦ The embryo continues to grow and develop organs to become a foetus. | ½ | |
| | ♦ Through the help of disc shaped special tissues embedded in the uterine wall is called placenta. | ½ | |
| | ♦ Placenta contains villi on the side of the embryo and provides an area to transport oxygen and glucose from mother. | 1 | |
| | b) | | |
| | ♦ The seed contains an embryo that germinates under suitable conditions. | ½ | |
| | ♦ The radicle develops into a future root. | ½ | |
| | ♦ The plumule develops into a future stem. | ½ | |
| | ♦ The food stored in the cotyledon is used for growth until photosynthesis begins. | ½ | 5 |