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Time : 3 Hours

SCIENCE (E)

Subject Code

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Total No. of Questions : 67 (Printed Pages : 15)

Maximum Marks : 70

INSTRUCTIONS : Read the following instructions carefully and strictly follow them :

- (i) There are **67** questions in the question paper. *All* questions are compulsory.
- (ii) Question Nos. **1** to **14** are multiple choice questions carrying *one* mark each.
- (iii) Question Nos. **15** to **18** are very short answer type questions, carrying **1** mark each.
- (iv) Question Nos. **19** to **46** are short answer type I questions carrying **2** marks each.
- (v) Question Nos. **47** to **58** are short answer type II questions, carrying **3** marks each.
- (vi) Question Nos. **59** to **67** are long answer type questions, carrying **4** marks each.
- (vii) There is no overall choice in the question paper. However, an internal choice has been provided for *three* questions of **2** marks, *two* questions of **3** marks and one question of **4** marks. Only one of the choices in such questions has to be attempted.
- (viii) In addition to this, separate instructions are given for each question wherever necessary.

Select the correct alternative given below each statement and complete the statement :

1. Radiation that is highly damaging to organisms and it is known to cause skin cancer in human beings in 1

- Infra-red radiations
- Visible radiations
- Ultraviolet radiations
- Microwaves

2. The decomposition of vegetable matter into compost is an example of 1

- Endothermic reaction
- Reduction reaction
- Exothermic reaction
- Displacement reaction

3. Salivation and vomiting is controlled by 1

- Spinal cord
- Hind brain
- Fore brain
- Mid brain

4. The first member of alkyne homologous series is 1
- Ethane
 - Ethyne
 - Methene
 - Methane
5. Gustatory receptors detect 1
- Taste
 - Smell
 - Touch
 - Sound
6. The opening and closing of the stomatal pore depends upon 1
- Oxygen
 - Temperature
 - Water in guard cells
 - Concentration of carbon dioxide in stomata
7. The growth of tendrils in pea plants is due to 1
- Effect of gravity
 - Effect of light
 - Rapid cell divisions in tendrillar cells in contact with support.
 - Rapid cell divisions in tendrillar cells that are away from the support.

8. The apparent flattening of the sun's disc at sunrise and sunset is due to 1
- Scattering of light
 - Dispersion of light
 - Reflection of light
 - Atmospheric refraction
9. Metals like are obtained by electrolysis of the molten chloride. 1
- Zinc, iron and lead
 - Gold, silver and copper
 - Aluminium, zinc and iron
 - Sodium, magnesium and calcium
10. Enzyme that converts starch into sugar is 1
- Pepsin
 - Trypsin
 - Lipase
 - Amylase
11. Neutralization reaction among the following is 1
- $2\text{NaOH} + \text{Zn} \longrightarrow \text{Na}_2\text{ZnO}_2 + \text{H}_2$
 - $\text{NaOH} + \text{HCl} \longrightarrow \text{NaCl} + \text{H}_2\text{O}$
 - $\text{Na}_2\text{O} + \text{CO}_2 \longrightarrow \text{Na}_2\text{CO}_3$
 - $4\text{Na} + \text{O}_2 \longrightarrow 2\text{Na}_2\text{O}$

12. Multi-cellular organisms like can be cut into any number of pieces and each piece grows into a complete organism. 1

- Amoeba and hydra
- Paramecium and planaria
- Hydra and planaria
- Plasmodium and amoeba

13. The refractive index of glass is 1.5, velocity of light in glass is 1

- 2×10^8 m/s
- 3×10^8 m/s
- 4.5×10^8 m/s
- 6×10^8 m/s

14. When an iron nail is immersed in the copper sulphate solution, the iron nail becomes brownish and copper sulphate solution fades in colour and forms a pale green solution. The pale green solution left in the test tube is 1

- Copper sulphate
- Copper chloride
- Iron sulphate
- Iron chloride

Name the following/Give a term :

15. The accumulation of non-biodegradable pesticides in the food chain in increasing amount at each trophic level. 1
16. The process of changing magnetic field in a conductor results in current in another conductor. 1

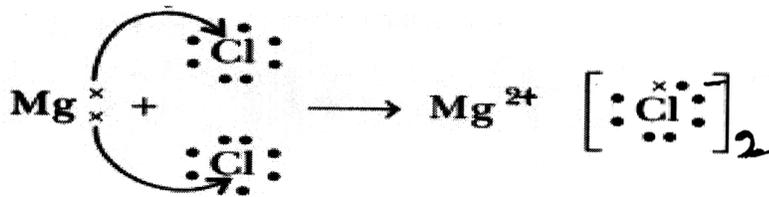
Observe the correlation in the first pair and complete the second pair :

17. 1 Diopetre : focal length 1 metre :: - 2 Diopetre : 1
18. $\frac{Q}{t}$: Current I :: $\frac{W}{Q}$: 1

What happens when : 2

19. Gypsum is heated at 373 K.
20. When electricity is passed through an aqueous solution of sodium chloride?

Elements react with each other to attain a completely filled valence shell. Given below is the formation of a compound : 2



21. Write the molecular formula of the above compound and name the type of compound formed.

22. This type of compounds do not conduct electricity in solid state but conduct electricity in molten state. Give reason :

Attempt the following : 2

23. Balance the following chemical reaction :



24. In a chemical reaction, the total mass of the elements present in the products has to be equal to the total mass of the elements present in the reactants. why ?

Plants and animals require a specific pH range for their healthy growth : 2

25. Milk of magnesia when taken orally reduces pain and irritation in our stomach. Give reason.
26. What effect does the concentration of H^+ (aq) ions have on the nature of saliva in our mouth ?

The functional groups present in the carbon compounds dictate the property of that compound : 2

27. Identify and name the functional group present in ethanone and butanoic acid.
28. Draw the structure of cyclohexane (complete molecule).

Answer the following : 2

29. List any *two* types of contraceptive methods for men.
30. State *two* functions performed by a special tissue called placenta.

Carbon and energy requirements of the autotrophic organisms are fulfilled by photosynthesis : 2

31. State the form in which the following is stored :
- (a) Unused carbohydrates in plants
- (b) The energy that derived from food in humans.
32. List the events that occur during the process of photosynthesis.

Answer the following : 2

33. Bleaching powder is extensively used in cotton and line industries, state any other *two* uses of it.
34. Hydrogen gas is not evolved when metal reacts with HNO_3 . Give reason.

Gregor Mendel was growing pea plants in two fields 'A' and 'B'. While the plants in field 'A' produced white coloured flowers, plants in Field 'B' produced yellow coloured flowers.

It was observed that in field 'A', all the plants showed white coloured flowers for consecutive generations, whereas in field 'B', majority of the plants showed variations in colours. 2

35. What are the probable reasons for these ?

36. "It is possible that a trait is inherited but may not be expressed in the next generation". Give reason to justify this statement.

Attempt the following : 2

37. Suggest one word for the statement/definition :

"Each step or level of food chain where transfer of energy takes place."

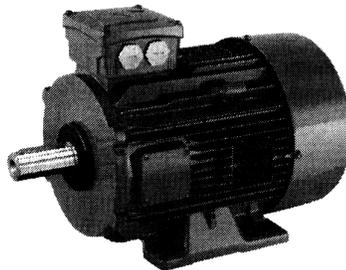
38. The existence of decomposers is essential in an ecosystem. Give reason.

Different species use different strategies to determine the sex of new born : 2

39. How can genetic inheritance determine sex in human beings ? Explain.

40. Write *two* points of difference between X chromosomes and Y chromosomes.

Observe the following figure and answer the questions given below : 2

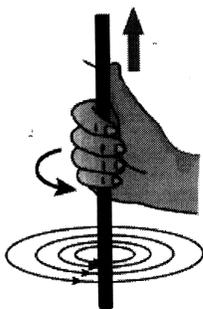


41. Which rule can be used to explain above device, also state the principle behind its functioning.

42. Write a point of difference between the usage of split-ring in an electric motor and in an electric generator.

Or

Observe the following figure and answer the questions given below : 2



41. State the application of the above rule.
42. How can the magnitude of the magnetic field be increased at a given point in a current carrying copper wire.

Do as directed : 2

43. An electric heater rated 400 W operates 6 hours per day. Find the cost of energy to operate it for 30 days at three rupees per unit.
44. Though the same current flows through the electric line wires and bulb filament, yet only the filament glows, why ?

Or

Do as directed : 2

43. An electric bulb of resistance 200 ohms draws current of 1 Ampere. Calculate the power of the bulb and the potential difference at its end.

44. State three factors on which the heat produced by an electric current depends.

“Plant hormones do not always promote growth.” 2

45. Cite an example in support of the above statement and mention the function of that plant hormone.
46. How do shoot and roots of a plant respond to the pulls of earth's gravity ?

Or

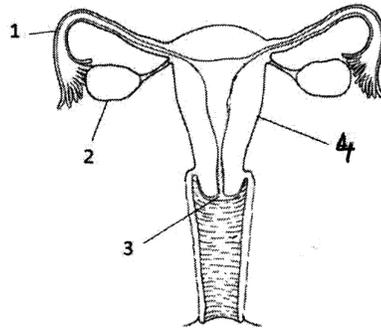
A squirrel is in a scary situation. Its body has to prepare for either fighting or running away. 2

45. State the immediate changes that take place in its body so that the squirrel is able to run or fight ?
46. How the timing and the amount of hormone released is regulated in human body ?

Answer the following : 3

47. State the importance of using a fuse in a house hold electrical circuit.
48. Distinguish between the magnetic field around a bar magnet and a solenoid with respect to the strength of the magnetic field.
49. An electrician used three insulated wires of colours green, red and black in a domestic circuit. State the function of green wire in the circuit.

From the figure given below identify the parts and their functions : 3



50. Which of the numbers represent the site of fertilization and the site of implantation and name the sites.
51. How is the surgical removal of unwanted pregnancies misused ?
52. Write *two* major functions of placenta.

Various processes are very essential to maintain life. 3

53. Write the structural differences between the composition of artery and vein.
54. How is the amount of urine produced regulated ?
55. Where does aerobic respiration occur in a cell and name the three-carbon molecule broken down there in the presence of oxygen ?

Or

Products of photosynthesis are moved from leaves to other parts of the plant. 3

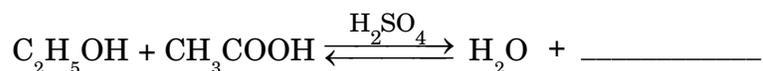
53. Write a point of difference between transpiration and translocation.

54. Plants have low energy needs as compared to animals. Give reason.
55. Where are the waste products stored in plants ?

Answer the following :

3

56. Complete and write the following reaction given below :



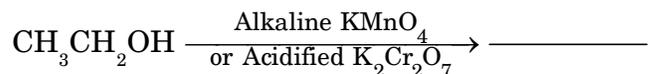
57. Saponification process is used to make soap. Explain the saponification reaction.
58. What is the role of conc. H_2SO_4 in making ethene from ethanol ?

Or

Answer the following :

3

56. Complete and write the following reaction given below :



57. Soaps and detergents are made of different type of salts. State the difference between their salts.
58. In the science lab of your school you have two bottles of carbon compounds with the molecular formula C_4H_8 and C_5H_{12} respectively. Which one of these is most likely to show addition reaction ? Justify your answer.

Two resistors of 4 ohm are connected together in a circuit so that the total resistance is 2 ohm.

4

59. Draw a circuit diagram to show the above arrangement of combination of resistors, also connect an ammeter, a switch and two cells of 1.5 each. Show the direction of flow of current.
60. Calculate the amount of current flowing in the above circuit if the cross section of those two resistors of 4 ohm are doubled and connected to above circuit in the same way.
61. 100 j of heat is produced each second in a 4 ohm resistor. Find the potential difference across the resistor.

The human eye is one of the most sensitive sense organs : 4

62. When do we consider a person to be myopic or hypermetropic ?
63. How does a bi-focal lens correct the vision of person with presbyopia ?
64. Explain with the help of a ray diagram how the defect associated with hypermetropic eye can be corrected.

Do as directed : 4

65. A slide projector has a convex lens with a focal length of 15 cm. The slide is placed upside down 16 cm from the lens. How far away should the screen be placed from the slide projector lens so that the slide is in focus ?
66. A ray of light travelling in kerosene enters obliquely into water. Does the light ray bend towards or away from the normal. Why ?

67. Draw a ray diagram to show the formation of image of an object placed at $2F_1$ of a convex lens.

Or

Do as directed :

4

65. The image formed by a spherical mirror is real, inverted and is of magnification-2. If the image is at a distance of 30 cm from the mirror, where is the object placed.
66. Give reasons why shaving mirrors and mirror used by dentists are of the same type.
67. Draw a ray diagram to show the formation of image of an object placed at the centre of curvature of a concave mirror.