Time Allotted: 03:00:00
Maximum Marks: 80
SECTION - Section A
SECTION - 1
Q1
Define hydrocarbons.

SECTION - 2
Q1
How does the atomic radius vary in a period on moving from left to right?

SECTION - 3
Q1
Answer question numbers 3(a) - 3(d) based on your understanding of the following paragraph and the related studied concepts.

The Sun has been radiating an enormous amount of energy at the present rate for nearly 5 billion years and will continue radiating at the same rate for about another 5 billion years

Silicon, which is used for making solar cells, is abundant in nature but availability of the special grade silicon for making solar cells is limited. In spite of the high cost and low efficien

(a) Define solar energy. [1]

(b) What is the output voltage generated by a solar cell when exposed to sun. [1]

(c) Which main element is used to manufacture solar cells? [1]

(d) Discuss some of the applications of solar cells. [1]

SECTION - 4
Q1
Question numbers 4(a) - 4(d) are based on the figures given below. Study these figures related to reflex action and answer the questions that follow.


Figure 1


Figure 2

(a) What does the swinging of arm away from the cup indicate in figure 2? [1]

(b) How does the person detect that he is touching a hot object? [1]

(c) In what form is the information transmitted in the nervous system? [1]

(d) Which of the following carries information from the nervous system to specific receptors? [1]

(i) Sensory neurons

(ii) Motor neurons

(iii) Olfactory receptors

(iv) Gustatory receptors

SECTION - 5
Q1
When a 150 V battery is connected across a resistor of 30 Ω. The value of the current flowing through the resister is

(a) 1 A

(b) 2 A

(c) 5 A

(d) 8 A

SECTION - 5
Q1
The rating of an electric bulb is 220 V and 80 W. If it is operated at 110 V, then the power consumed will be

(a) 10 W

(b) 20 W

(c) 40 W

(d) 80 W

SECTION - 6
Q1
Which of the following is controlled by ciliary muscles in human eye?

(a) Pupil

(b) Retina

(c) Cornea

(d) Eye lens

SECTION - 7
Q1
An example of non-renewable source of energy is

(a) sun

(b) river

(c) wind

(d) fossil fuel

SECTION - 8
Q1

Recently, the 'Statue of Unity' has been constructed in Gujarat, which has become one of the major tourists' attractions. A few years back, a dam was also constructed near this s

(a) Bhakra Nangal Dam built across Sutlej River

(b) Tehri Dam built across Bhagirathi River

(c) Gandhi Sagar Dam built across Chambal River

(d) Sardar Sarovar Dam built across Narmada River

SECTION - 8

Q1

In Malaysia and Indonesia, many hectares of natural forests have been cleared for oil palm plantations. However, both countries have also practiced reforestation.

But replanted forests and plantations are less useful for conservation than the natural forest. Why?

(a) They are often less diverse as compared to natural forests.

(b) They do not produce useful plant products.

(c) They are not sustainable forests.

(d) Some of the common plant species cannot grow there.

SECTION - 9

Q1

Which of the following life processes is shown in the given image?

a) Respiration
b) Nutrition
c) Excretion
d) Circulation

SECTION - 10

Q1

Formation of water from hydrogen and oxygen gas is an example of

(i) combination reaction

(ii) decomposition reaction

(iii) exothermic reaction

(iv) both (i) and (iii)

SECTION - 11

Q1

Which one of the following is an example of acidic salt?

(a) NaCl

(b) $CaCO_3$

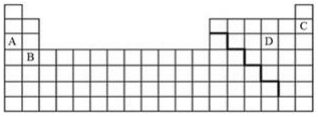
(c) NH_4Cl

(d) KCl

SECTION - 12

Q1

Four elements A, B, C and D are placed in the modern periodic table as shown. Identify the elements whose oxides will turn red litmus paper blue.



(a) C and D

(b) A and B

(c) A and D

(d) B and D

SECTION - 12

Q1

Elements W, X, Y and Z have atomic numbers 10, 12, 17 and 19 respectively. Identify the reactive metals among the following.

(a) X and Z

(b) Y and Z

(c) W and X

(d) W and Y

SECTION - 13

Q1

Assertion (A): Graphite is smooth and slippery in nature.

Reason (R): In graphite, the hexagonal layers of carbon atoms are held together by weak van der Waals forces.

(a) Both A and R are true and R is correct explanation of A.

(b) Both A and R are true but R is not the correct explanation of the A.

(c) A is true but R is false.

(d) A is false but R is true.

SECTION - 14
Q1
Assertion (A): Keeping other parameters of conductor constant, resistance of a conductor decreases with increase in length of conductor.

Reason (R): Heat produced is proportional to the length of the conductor of conductor, keeping other parameters of conductor constant.

(a) Both A and R are true and R is correct explanation of A.

(b) Both A and R are true but R is not the correct explanation of the A.

(c) A is true but R is false.

(d) A is false but R is true.

SECTION - Section B
SECTION - 15
Q1
(i) What happens when silver chloride is kept in sunlight for some time?

(ii) Name the type of reaction.

(iii) Write a balanced chemical equation to represent the above reaction.

SECTION - 16
Q1
A compound 'P' of calcium is used to make acidic soil basic and it reacts with water vigorously.

(i) Name the compound 'P' and give its chemical formula.

(ii) Write a balanced chemical equation to represent the reaction of compound 'P' with water.

(iii) Will the above reaction be exothermic or endothermic?

SECTION - 16
Q1
Dilute sulphuric acid was added to a test tube containing zinc granules.

(i) Identify the gas evolved during the reaction.

(ii) Write the balanced chemical equation for the reaction.

(iii) Identify the type of reaction.

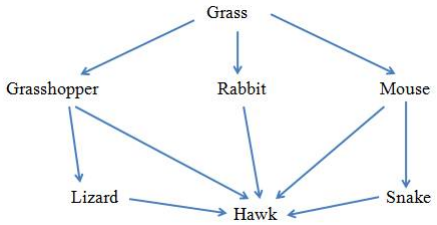
SECTION - 17
Q1
Two elements A and B have atomic numbers 11 and 17 respectively.

(i)To which period of modern periodic table do these two elements belong?

(ii)What type of bond will be formed between them and why?

(iii) Write the chemical formula of the compound formed.

SECTION - 18
Q1
Answer the following questions based on the given food web.



(i) Classify the animals in the food web as primary, secondary and tertiary consumers.

(ii) Write all the food chains that are interconnected in the food web.

SECTION - 18
Q1
Lakes and ponds do no require time to time cleaning. However, a fish aquarium requires it. Why?

SECTION - 19
Q1
What will happen to the photosynthesis rate in the following situations?

(a) Good manure application

(b) Lack of rainfall

(c) Blockage of stomata

SECTION - 20
Q1
Our qualifications and experiences cannot be passed on to the next generation. Justify.

SECTION - 21
Q1
'In human beings, control and coordination is performed by hormonal and nervous systems together.' Explain.

SECTION - 22
Q1
An object 5 cm in length is held 25 cm away from a converging lens of focal length 10 cm. Find the position, size and nature of the image formed. Also draw the ray diagram.

SECTION - 23
Q1
(a) What is overloading.

(b) How does an electric short circuit occur? Which device is used to prevent circuit from short circuit?

SECTION - 24
Q1
What is dispersion? What is its cause?

SECTION - 24
Q1
Name a phenomenon occurring in the nature due to dispersion of light. When white light passes through a prism, which colour travels the slowest and why?

SECTION - Section C
SECTION - 25
Q1
'P' and 'Q' are two ores of zinc metal. On heating ore 'P' gives CO_2 whereas ore 'Q' gives SO_2. Identify the name of ores 'P' and 'Q'. What steps will you take to convert them into

SECTION - 25
Q1
State the reason for the following:

(i) Platinum and gold are used for making ornaments.

(ii) Metals can be drawn into wires.

(iii) During the extraction of metals, carbonate and sulphide ores are converted into oxides before reduction.

(iv) Metals like Na, K and Ca are never found in free state.

(v) A zinc strip dipped in a blue copper sulphate solution turns the blue solution colourless after sometime.

SECTION - 26
Q1
The formulae of four organic compounds are given below.

S	T	U	V
CH_3COOH	C_2H_2	C_2H_5OH	CH_4

(i) Which of these compounds S, T, U and V is an unsaturated hydrocarbon?

(ii) Identify the alcohol and give its structural formula.

(iii) Write the next homologue of compound V.

(iv) Identify the functional group present in compound S.

(v) Which of the above compound when reacted with chlorine in the presence of sunlight, forms chloromethane? Give chemical equation also.

SECTION - 27
Q1
(i)Draw the human alimentary canal and label the following:

Oesophagus, Stomach, Liver, Small intestine, Large intestine

(ii) What modifications are found in the small intestine for the absorption of food?

(iii) What is peristalsis?

SECTION - 28
Q1
(i) Observe the data in the tables given below and answer the following questions.

Plants	Number of chromosomes
Wheat	42
Tomato	24
Rice	24
Potato	48

Animals	Number of chromosomes
Elephant	58
Dog	78
Cow	60
Cat	38

(a) Do you think reproduction will be easier in organisms with fewer chromosomes?

(b) Is the DNA content more in organisms with greater number of chromosomes?

(c) Is the number of chromosomes more in larger organisms?

(ii) The female gametes in a rabbit have 22 chromosomes. What is the number of chromosomes in the zygote and male gamete?

SECTION - 28

Q1

Why is reproduction essential? How sexual reproduction leads to variations and what is the significance of these variations?

SECTION - 29

Q1 Find the voltage across each resistor and current flowing through each resistor if the value of each resistor is $10\,\Omega$ in the given circuit.
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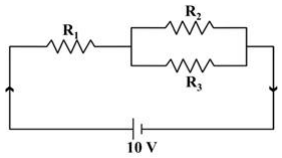

SECTION - 30

Q1

Define magnification of mirror. A spherical mirror forms an erect image three times the size of the object. If the sum of the image and the object distance is 100 cm, find the focal l

SECTION - 30

Q1

Define refraction of light. While performing an experiment for observing refraction of light through a rectangular glass slab, a student observed that ray of light incidents at an ang

(a) What will be the angle of emergence?

(b) Draw a labelled diagram to show the path of the incident ray.