

- (b) ₹16
- (c) ₹8
- (d) ₹4

(iv) Calculate the energy transformed by a 5 A current flowing through a resistor of  $2\Omega$  for 30 minutes?

- (a) 90 kJ
- (b) 80 kJ
- (c) 60 kJ
- (d) 40 kJ

**Answers**

**SECTION - A**

Select and write one most appropriate option out of the four options given for each of the questions 1 – 20

Q. No	Answers	Marks
1	a	1
2	d	1
3	a	1
4	c	1
5	d	1
6	b	1
7	a	1
8	c	1
9	a	1
10	a	1
11	c	1
12	b	1
13	c	1
14	a	1
15	b	1
16	d	1
17	a	1
18	b	1
19	a	1
20	a	1

**SECTION - B**

Q. no. 21 to 26 are very short answer questions.

21	Resistance of a conductor depends upon the following factors:	2
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(1) Length of the conductor: (Treater the length (l) of the conductor more will be the resistance (R).

$$R \propto l$$



(2) Area of cross section of the conductor: (Greater the cross-sectional area of the conductor, less will be the resistance.

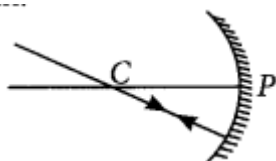
$$R \propto \frac{1}{A}$$

(3) Nature of conductor.

(ii) SI unit of resistivity is  $\Omega \text{ m}$ .

22 Covalent compounds have low melting and boiling points because the forces of attraction between molecules of covalent compounds are very weak. On applying a small amount of heat these molecular forces break. 2

23 Ray of light passing through centre of curvature of concave mirror, after reflection 2



24 The two main steps involved in sexual reproduction are: 2

- formation of male and female gametes.
- Fusion of a male gamete with a female gamete to form a new cell called zygote by the process of fertilisation.

25 Elements forming ionic compounds attain noble gas electronic configuration by either gaining or losing electrons from their valence shells. Explain giving reason why carbon cannot attain such a configuration in this manner to form its compounds. Name the type of bonds formed in ionic compounds and in the compounds formed by carbon. Also explain with reason why carbon compounds are generally poor conductors of electricity 2

26 **Hydrated salt** 2  
A salt with one or more chemically combined water molecule is called hydrated salt, e.g., washing soda,  $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$

#### **Anhydrous salt**

A salt in which all water molecules are removed, is called anhydrous salt, e.g., soda ash,  $\text{Na}_2\text{CO}_3$ .

#### **SECTION - C**

Q. no. 27 to 33 are short answer questions.

27 (a) Implantation is the close attachment of the blastocyst (young multicellular embryo) to the uterine wall. It is followed by a number of developmental changes in the thickened wall of uterus. An intimate connection between the fetal membrane and the uterine wall called placenta is formed. This is a disc which is embedded in the uterine wall. The placenta serves as the nutritive, respiratory and excretory organ of the fetus. 3



(b) When the female gamete/egg is not fertilised, this lining is not needed any longer. So, the lining slowly breaks and comes out through vagina as blood and mucus. This cycle takes place every month and is known as menstrual cycle.

28 Strength of magnetic field produced by a current carrying solenoid depends upon the following factors: 3

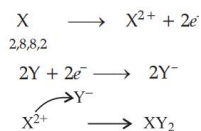
- number of turns in the coil
- amount of current flowing through it
- radius of coil
- Material of core of the solenoid.

29 A gene is a unit of DNA on a chromosome which governs the synthesis of particular protein that controls specific characteristics (or traits) of an organism. 3

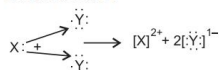
The inheritance of characters (or traits) from the parents to their offspring is called heredity.

All the variations do not have equal chances of survival in the environment in which they live. Depending on the nature of variations, different individuals would have different kinds of advantages. The organisms which are most adapted to the environment will survive.

30 Answer : X = 20; 2, 8, 8, 2 3  
Y = 17; 2, 8, 7



Electron-dot structure :



The nature of bond will be ionic.

31 (i) Cornea: It is a transparent bulge on the front surface of eyeball which refracts most of the light rays. 3

(ii) Iris is a dark muscular diaphragm that controls the size of the pupil.

(iii) The crystalline lens of human eye focuses the light that enters the eye and form the image on the retina.

32 Water of crystallization : 3

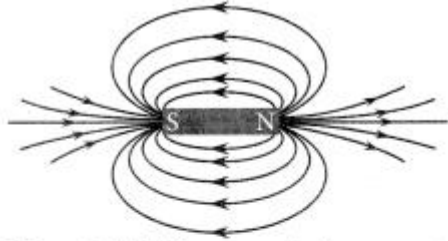
Crystals of some salts contain certain amount of associated water. The water associated with the crystal (or molecule) of any salt is called water of crystallisation.

it is sodium carbonate dehydrate. Its molecular formula is Na<sub>2</sub>CO<sub>3</sub>.10H<sub>2</sub>O.

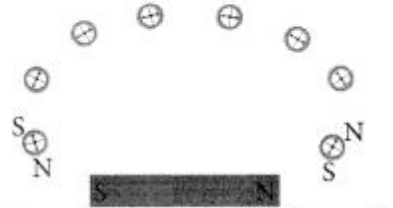
33 One can easily demonstrate the presence of field lines around a bar magnet using compass needles. Place the magnet on a white sheet and mark its boundaries on sheet. Place the compass near the north pole of magnet and 3



mark the position of needle. Now move the compass such that its south pole occupies the position previously occupied by its north pole. Repeat this step several times and you will have pattern as shown in the figure.



Magnetic field lines around a bar magnet



Drawing a magnetic field line with the help of a compass needle

#### SECTION - D

Q. no. 34 to 36 are long answer questions.

- 34 In an ecosystem, only 10% of energy is transferred from one trophic level to next, i.e. 10 percent law and rest is dissipated into the environment. Therefore, if plants (being producers-1st trophic level)-transfer 500 J of energy to rats (2nd trophic level) then rats would transfer 50 J of energy to snakes (3rd trophic level) which in turn will transfer only 5 J of energy to hawks (4th or last trophic level) in a food chain. 5

Plants → Rats → Snakes → Hawks  
5000 J    500 J    50 J    5 J

Two biotic components of a biosphere are:  
(i) Producers – Include organisms which can produce their food using simple inorganic compounds, e.g., all green plants, blue green algae (cyanobacteria).  
(ii) Consumers – Include organisms which are unable to synthesise their food, therefore, utilise materials and energy stored by the producers or eat other organisms, e.g., all the animals.

- 35 5

	Soap	Detergents
(i)	Soaps are sodium salts of long chain carboxylic acids.	Detergents are sodium salt of long chain benzene sulphonic acids.
(ii)	The ionic group in soap is $\text{COONa}^+$	The ionic groups in detergents is $\text{SO}_3^-, \text{Na}^+$
(iii)	Soaps are not useful when water is hard.	Detergent can be used for washing purpose even when water is hard.
(iv)	Soaps are biodegradable.	Some of the detergents are non- biodegradable.
(v)	Soaps have relatively weak cleansing action.	Detergents have strong cleansing action.

Mechanism of the cleansing action of soaps: The dirt present on clothes is large surface area for glucose and oxygen to pass from mother to the embryo. The placenta draws nourishment and oxygen, which it supplies to the foetus, from the maternal circulation. In turn, the placenta receives carbon dioxide and wastes of fetal metabolism and discharges them into the maternal circulation for disposal. organic matter and insoluble in water. Therefore it cannot be removed

36 Methods developed to prevent pregnancy are:

5

- barrier method, i.e., use of condoms, diaphragm, etc.
- chemical method, i.e., use of oral pills or vaginal pills.
- surgical method, i.e., vasectomy and tubectomy. Out of these methods, chemical method is not meant for males.

Use of these techniques help to keep control over number of children in a family, which directly effects prosperity of a family. One of the most common reason for deterioration of women's health is frequent conception and child bearing. Controlled childbirth will directly affect women health and this will indirectly affect the prosperity of family and nation.

### SECTION - E

Q. no. 37 to 39 are case - based/data-based questions with 2 to 3 short sub-parts. Internal choice is provided in one of these sub-parts.

37 (i) (b) 4

(ii) (c)

(iii) (d)

(iv) (a)

38 (i) Ans: Mammals- 4 chamber heart and reptiles- 3 chambered heart 4

(ii) Ans: Vena cava carries deoxygenated blood from body to heart.

(iii) Ans: The blood goes through the heart twice during each cycle known as double circulation.

(iv) Ans: The force that blood exerts against the wall of a vessels is called hypertension or high blood pressure.

OR

- 39 (iv) Ans: Sphygmomanometer  
(i) (a)  
(ii) (c)  
(iii) (b)  
(iv) (a)

4

