

General Instructions:

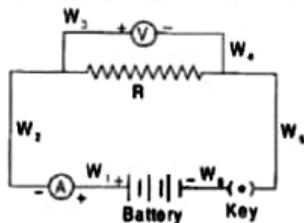
- This question paper consists of 39 questions in 5 sections.*
- All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.*
- Section A consists of 20 objective type questions carrying 1 mark each.*
- Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should in the range of 30 to 50 words.*
- Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should in the range of 50 to 80 words*
- Section D consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.*
- Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.*

Section A

1. A cross between a tall plant (TT) and short pea plant (tt) resulted in progeny that were all tall plants because [1]

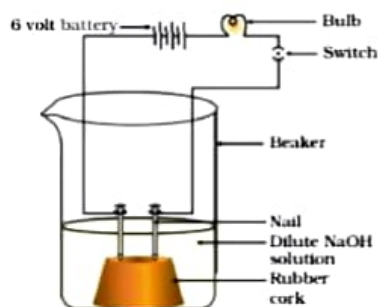
- | | |
|---|------------------------------------|
| a) height of pea plant is not governed by gene 'T' or 't' | b) tallness is the recessive trait |
| c) shortness is the dominant trait | d) tallness is the dominant trait |

2. A student sets up the circuit, for studying the dependence of current (I) flowing, on the applied potential difference (V), in the manner shown. The ammeter and the voltmeter, in his circuit, have been checked and found to be correct. On closing the key K, he observes a deflection in the ammeter but no deflection in the voltmeter. This could be due to a loose connection, or break, in the wire :



- | | |
|-------------------------------------|-------------------------------------|
| a) W ₅ or W ₆ | b) W ₆ or W ₁ |
| c) W ₁ or W ₂ | d) W ₃ or W ₄ |
3. An electron enters a magnetic field at right angles to it, as shown in Fig. The direction of force acting on the electron will be [1]

correct?



- i. Bulb will not glow because electrolyte is not acidic
- ii. Bulb will glow because NaOH is a strong base and furnishes ions for conduction
- iii. Bulb will not glow because circuit is incomplete
- iv. Bulb will not glow because it depends upon the type of electrolytic solution

- a) (iv) only
- b) (ii) and (iv)
- c) (ii) only
- d) (i) and (iii)

10. Match the following with correct response.

[1]

- (1) Transmission of characters from parent to offspring
- (2) Differences among the individual of same species
- (3) Branch of science deals with heredity and variation
- (4) Development of new organism by modifications in pre existing ones

- (A) Hereditary
- (B) Genetics
- (C) Variation
- (D) Evolution

- a) 1-B, 2-D, 3-A, 4-C
- b) 1-D, 2-A, 3-C, 4-B
- c) 1-C, 2-B, 3-D, 4-A
- d) 1-A, 2-C, 3-B, 4-D

11. Where does the embryo develop in a human female?

[1]

- a) Seminal vesicles
- b) Fallopian tube
- c) Vagina
- d) Uterus

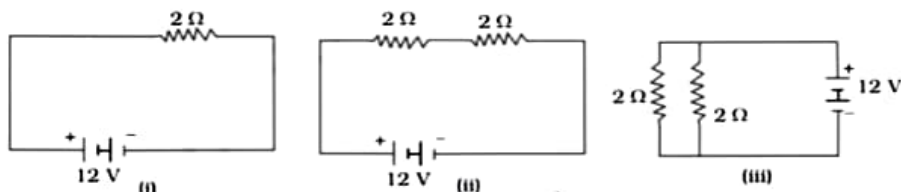
12. Which colour of light has the longest wavelength?

[1]

- a) Violet
- b) Green
- c) Yellow
- d) Red

13. In the following circuits (Figure), heat produced in the resistor or combination of resistors connected to a 12 V battery will be

[1]



- a) Minimum in case (i) b) Same in all the cases
c) Maximum in case (iii) d) Maximum in case (ii)
14. The composition of aqua-regia is [1]
a) Dil.HCl : Dil.HNO₃ b) Conc.HCL : Conc. HNO₃
3 : 1 3: 1
c) Conc.HCl : Dil. HNO₃ d) Dil.HCl : Conc. HNO₃
3 : 1 3 : 1
15. Chlamydia is related to: [1]
a) Urethra b) Syphilis
c) Gonorrhea d) HIV
16. A factor not affecting photosynthesis is [1]
a) Carbon dioxide concentration in air b) Temperature
c) Light intensity d) Wind velocity
17. **Assertion (A):** A solenoid tends to expand, when a current passes through it. [1]
Reason (R): Two straight parallel metallic wires carrying current in same direction attract each other.
a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A.
c) A is true but R is false. d) A is false but R is true.
18. **Assertion (A):** Our body maintains blood sugar levels. [1]
Reason (R): Pancreas secretes insulin which helps to regulate blood sugar levels in the body.
a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A.
c) A is true but R is false. d) A is false but R is true.
19. **Assertion (A):** Aquatic food chain is the food chain present in water bodies. [1]
Reason (R): The example of an aquatic food chain is:
phytoplankton → zooplankton → fish → shark
a) Both A and R are true and R is b) Both A and R are true but R is

the correct explanation of A.

not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

20. **Assertion (A):** On adding H_2SO_4 to water the resulting aqueous solution gets corrosive. [1]

Reason (R): Hydronium ions are responsible for corrosive action.

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

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

c) A is true but R is false.

d) A is false but R is true.

5

Section B

21. Write the chemical equations of the reaction of ethanoic acid with the following: [2]
- Sodium
 - Sodium hydroxide
 - Ethanol

OR

What are the properties of carbon which lead to huge number of carbon compounds we see around us?

22. Describe how ozone present in the atmosphere is important for sustaining life on earth? [2]
23. Answer the following: [2]
- Name the endocrine gland associated with brain.
 - Which gland secretes digestive enzymes as well as hormones?
 - Name the endocrine gland associated with kidneys.
 - Which endocrine gland is present in males, but not in females?
24. What are decomposers? What will be the consequence of their absence in an ecosystem? [2]
25. Name the reaction which is commonly used in the conversion of vegetable oils to fats. Explain the reaction involved in detail. [2]
26. A concave lens has focal length of 20 cm. At what distance from the lens a 5cm tall object be placed so that it forms an image at 15 cm from the lens? Also calculate the size of the image formed? [2]

OR

A doctor has prescribed a corrective lens of power + 1.5 D. Find the focal length of lens. Is prescribed lens diverging or converging?

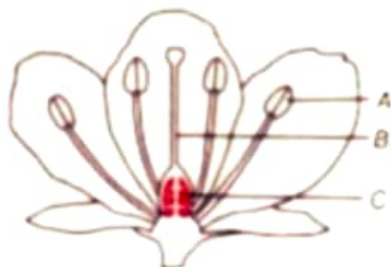
Section C

27. What should be the position of an object with respect to focus of a convex lens of focal length 20cm, so that its real and magnified image is obtained? [3]

28. Identify the type of reaction in the following [3]
- $\text{ZnCO}_3 + 2\text{HCl}(\text{aq}) \longrightarrow \text{ZnCl}_2(\text{aq}) + \text{H}_2\text{CO}_3(\text{aq})$
 - $2\text{NaBr}(\text{aq}) + \text{Cl}_2(\text{g}) \longrightarrow 2\text{NaCl}(\text{aq}) + \text{Br}_2(\text{aq})$
 - $2\text{CuO}(\text{s}) \xrightarrow{\text{heat}} 2\text{Cu}(\text{s}) + \text{O}_2(\text{g})$

29. Why do different rays deviate differently in the prism? [3]

30. Name the parts A, B and C shown in the following diagram and state one function of each. [3]



6

OR

Name one sexually transmitted disease each caused due to bacterial infected and viral infection. How can these prevented?

31. Give the characteristic tests for the following gases [3]

- CO_2
- SO_2
- O_2
- H_2

32. 1. Write the function of each of the following parts of human eye : cornea, iris, crystalline lens, ciliary muscles. [3]

2. Millions of people of the developing countries of world are suffering from corneal blindness. These people can be cured by replacing the defective cornea with the cornea of a donated eye.

A charitable society of your city has organised a campaign in your neighbourhood in order to create awareness about this fact.

If you are asked to participate in this mission how would you contribute in this noble cause?

- State the objective of organising such campaigns.
- List two arguments which you would give to motivate the people to donate their eyes after death.
- List two values which are developed in the persons who actively participate and contribute in such programme.

33. Study the following cross that shows the self-pollination in F_1 , fill in the blank the genotype and phenotype in the F_1 generation. What type of cross it is? [3]

Parents	RRYY	x	rryy

	Round, yellow		wrinkled, green
F ₁ —	Rr Yy	x	?
	Round, yellow		

OR

A pea plant with purple flowers were crossed with white flowers producing 40 plants with only purple flowers. On selfing, these plants produced 470 plants with purple flowers and 162 with white flowers. What genetic mechanism account for these results.

Section D

34. i. List in tabular form three chemical properties on the basis of which we can differentiate between a metal and a non-metal. [5]
- ii. Give reasons for the following:
- Most metals conduct electricity well.
 - The reaction of iron (III) oxide [Fe₂O₃] with heated aluminum is used to join cracked machine parts.

OR

7

- Write the electron-dot structures for sodium, oxygen and magnesium.
 - Show the formation of Na_2O and MgO by the transfer of electrons.
 - What are the ions present in these compounds?
35. What precaution should be taken to avoid the overloading of domestic electric circuit ? [5]
36. i. Write the correct sequence of steps followed during journey of oxygen rich blood from lungs to various organs of human body. [5]
- ii. What happens when the system of blood vessels develop a leak?

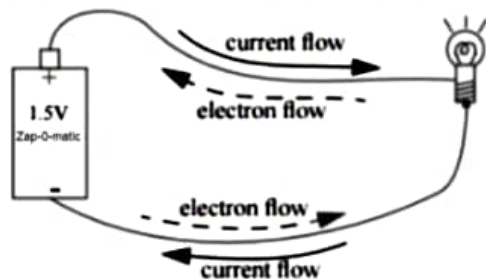
OR

Explain the process of digestion of food in mouth, stomach and small intestine in human body.

Section E

37. Read the text carefully and answer the questions: [4]

The rate of flow of charge is called electric current. The SI unit of electric current is Ampere (A). The direction of flow of current is always opposite to the direction of flow of electrons in the current.



The electric potential is defined as the amount of work done in bringing a unit-positive test charge from infinity to a point in the electric field. The amount of work

done in bringing a unit positive test charge from one point to another point in an electric field is defined as potential difference.

$$V_{AB} = V_B - V_A = \frac{W_{BA}}{q}$$

The SI unit of potential and potential difference is volt.

- (i) Write the formula of voltage in terms of work done, current, time and charge.
- (ii) What is the number of electrons flowing per second in a conductor if 1 A current is passing through it?

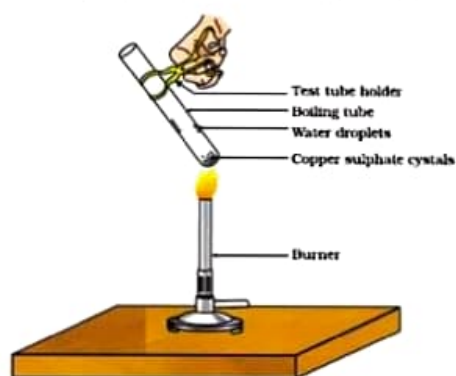
OR

What would be the potential difference between the two terminals of a battery, if 100 joules of work is required to transfer 20 coulombs of charge from one terminal of the battery to other?

38. Read the text carefully and answer the questions:

[4]

Copper sulphate crystal contains water of crystallisation when the crystal is heated the water is removed and salt turns white. The crystal can be moistened again with water. The water of crystallisation is the fixed number of water molecules present in 1 formula unit of copper sulphate. On heating gypsum at 373K, it loses water molecules and became calcium sulphate hemihydrate.



8

- (i) If the crystal is moistened with water, then which colour of the crystal reappears?
- (ii) What is the commercial name of calcium sulphate hemihydrate?
- (iii) How many water molecules are present in one formula unit of copper sulphate?

OR

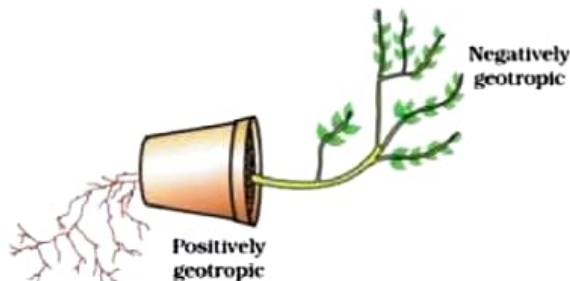
What is obtained when gypsum is heated at 373K?

39. Read the text carefully and answer the questions:

[4]

Environmental triggers such as light, or gravity will change the directions that plant parts grow in. These directional, or tropic, movements can be either towards the stimulus or away from it. So, in two different kinds of phototropic movement, shoots respond by bending towards light while roots respond by bending away from it. How does this help the plant? Plants show tropism in response to other stimuli as well. The roots of a plant always grow downwards while the shoots usually grow upwards and away from the earth. This upward and downward growth of shoots and roots, respectively, in response to the pull of earth or gravity, is, obviously, geotropism. If 'hydro' means water and 'chemo' refers to chemicals, what would

'hydrotropism' and 'chemotropism' mean? Can we think of examples of these kinds of directional growth movements? One example of chemotropism is the growth of pollen tubes towards ovules, about which we will learn more when we examine the reproductive processes of living organisms.



- (i) Where does negative phototropism occur in plants?
- (ii) Phototropism in shoots is attributed due to which plant hormone?
- (iii) Tendrils exhibit/ twining of tendrils show which type of tropic movement?

OR

If the stem grows towards sunlight and the root grows just opposite to it, then what type of movement of the stem is it?