

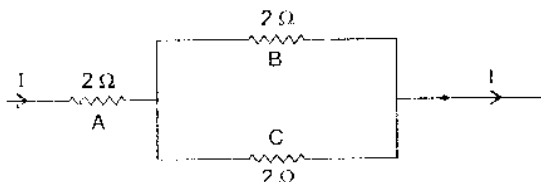
General Instructions

- (i) *The question paper comprises two sections, A and B, you are to attempt both the sections.*
- (ii) *All questions are compulsory.*
- (iii) *There is no overall choice. However internal choice has been provided in all the three questions of five marks category. Only one option in each question is to be attempted.*
- (iv) *All questions of Section A and all questions of Section B are to be attempted separately.*
- (v) *Question numbers 1 to 3 in Section A are one mark questions. These are to be answered in one word or one sentence.*
- (vi) *Question numbers 4 to 6 are two marks questions, to be answered in about 30 words.*
- (vii) *Question numbers 7 to 18 are three marks questions, to be answered in about 50 words.*
- (viii) *Question numbers 19 to 24 are five marks questions, to be answered in about 70 words.*
- (ix) *Question numbers 25 to 33 in Section B are based on practical skills. Each question is of one mark.*
- (x) *Question numbers 34 to 36 are based on practical skills. Each question is of two marks.*

Section-A

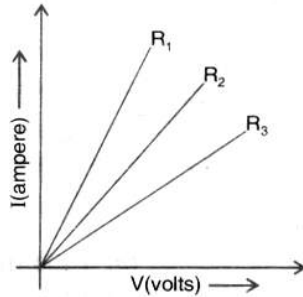
- 1. What is the structural and functional unit of nervous system ? Name its any two components. 1
- 2. Why should solar cooker be covered with glass plate ? 1
- 3. What does the tangent drawn at a point to the magnetic field line curves signify ? 1
- 4. Identify the substance oxidised, substance reduced, oxidising agent and reducing agent in the following reaction : 1

$$\text{MnO}_2 + 4\text{HCl} \longrightarrow \text{MnCl}_2 + \text{Cl}_2 + 2\text{H}_2\text{O}$$
 2
- 5. Give observation and write chemical equation for reaction of sodium with water. 2
- 6. (a) What material is used in making the fuse ? 2
 (b) Name the characteristics which make it suitable for this. 2
- 7. Three $2\ \Omega$ resistors, A, B and C are connected as shown in figure. Each of them dissipates energy and can withstand a maximum power of 18 W without melting. Find the maximum current that can flow through the three resistors. 2



- 8. (a) A knife, which is used to cut a fruit, was immediately dipped into water containing drops of blue litmus solution. If the colour of the solution is changed to red, what inference can be drawn about the nature of the fruit and why ? 3
 (b) Which acid is present in vinegar ? Is it weak or strong ? 3
- 9. (a) Write a balanced chemical equation for a combination reaction. 3
 (b) What happens in a displacement reaction. Justify your answer giving one example. 3
- 10. What would you observe when
 - (i) calcium oxide is added to water ?
 - (ii) barium chloride solution is added to sodium sulphate solution ?
 - (iii) lead nitrate is heated ?
 Write the reactions involved in each case ? 3

11. Complete and balance the following reactions :
- (i) $Mn(s) + HNO_3 (v.v. dil.) \longrightarrow$ (ii) $Cu(s) + O_2(g) \longrightarrow$ (iii) $CuCO_3(s) \xrightarrow{heat}$ 3
12. Draw a sectional view of human heart and label on it (i) Aorta (ii) Right ventricle and (iii) Pulmonary vein. 3
13. Name the hormones secreted by thyroid, pancreas and adrenal glands. Write one function of each of these hormones. 3
14. Mr. Bose has a plot of land where he does tea plantation. Yield from the plantation depends on number of shoots generated from a tea bush. Larger the area covered by a hush, higher is the yield for the hush. Mr. Chakravarty, a friend of Mr. Bose wants to help him and has therefore gone through various hooks to get an idea how they can increase the production.
- (a) What advice can Mr. Chakravarty give to Mr. Bose to increase the area of a bush in his plantation ?
 (b) What is the principle behind the above advice ?
 (c) What do you call the attitude of Mr. Chakravarty ? 3
15. (a) Which uses more energy, a 250 W TV set in 1 hr, or a 1200 W toaster in 10 minutes ?
 (b) How much current will an electric heater draws from a 220 V source if the resistance of heater is 100 Ω . 3
16. What does the direction of thumb indicate in the right-hand thumb rule ? In what way this rule is different from Fleming's left hand rule ? 3
17. (a) What is a fuel ? (b) Write any two characteristics of a good fuel. 3
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18. Suggest two materials that can be used to produce biogas. Mention two uses of biogas and two advantages of biogas plant. 3
19. An electric lamp of $R_1 \Omega$ and a conductor $R_2 \Omega$ are connected in series to a V volt battery. Calculate the
 (i) total resistance. (ii) total current in the circuit.
 (iii) potential difference across the conductor. 3
20. (a) Give the chemical names of acids present in (i) ants (ii) lemon (iii) milk (iv) tomato.
 (b) Write the chemical names of two salts belonging to sodium family.
 (c) Show by an activity aqueous solution of acid conducts electricity. (3+2=5)
21. (a) Name the main ore of mercury. How is mercury obtained from its ore ? Give balanced chemical equations.
 (b) What is thermite reaction ? How is it used to join the railway tracks or cracked machine parts ?
 (c) Name the method used to extract metals of high reactivity. 5
22. (a) Draw a diagram of an excretory unit of a human kidney and label the following :
 Bowman's capsule, Glomerulus, Collecting Duct, Renal Artery.
 (b) Write the important function of the structural and functional unit of kidney.
 (c) Write any one function of an artificial kidney. 5
23. (a) A positive charge particle projected towards west is deflected towards north by a magnetic field. What is the direction of magnetic field ?
 (b) A region 'A' has magnetic field lines relatively closer than another region 'B'. Which region has stronger magnetic field ? Give reason to support your answer.
 (c) Why two magnetic field lines cannot intersect ? 5
24. (a) State Ohm's law.
 (b) Draw a circuit diagram for the verification of Ohm's law. Also plot graphically the variation of current with potential difference.
 (c) A student carries out an experiment and plots the V-I graph of three samples of heating element, made of an alloy, with resistance R_1 , R_2 and R_3 respectively. Write them in decreasing order and give reason to support your answer. 5



Section-B

25. The pH value of a solution is 6. What is the colour developed when a student adds three drops of universal indicator in the solution ? 1
- (a) Red (b) Blue
 (c) Green (d) Orange

26. A few drops of liquid 'X' were added to distilled water. It was observed that pH of the water is increased. The liquid 'X' could be 1

- (a) lemon juice (b) NaCl solution
 (c) Na_2CO_3 solution (d) dilute HCl

27. Prachi added dil. HCl to a test tube containing zinc granules and noted the following observations : 1

- (I) The zinc surface became dull and black. (II) A gas evolved which burnt with a pop sound.
 (III) The solution remained colourless.

The observations found correct are

- (a) I and II (b) II and III
 (c) III and I (d) I, II and III

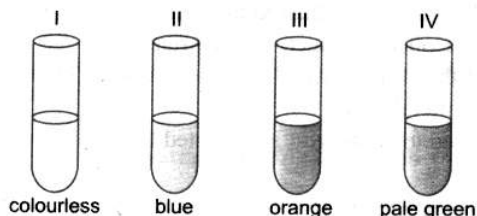
28. To show that iron is more reactive than copper, the correct procedure is to 1

- (a) prepare ferrous sulphate solution and dip copper strip in it.
 (b) prepare copper sulphate solution and dip iron strip in it.
 (c) add dil. nitric acid on both strips.
 (d) heat iron and copper strips both.

29. The colour of aluminium sulphate crystals is 1

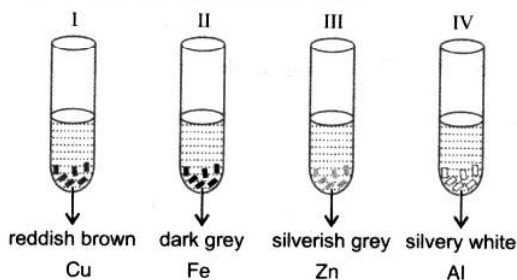
- (a) Blue (b) Yellow
 (c) Green (d) Colourless

30. A student took four test tubes containing solutions of different colours marked I, II, III and IV as shown below. The test tubes, containing copper sulphate solution and ferrous sulphate solution, could be the tubes 1



- (a) I and III (b) II and III
 (c) III and IV (d) II and IV

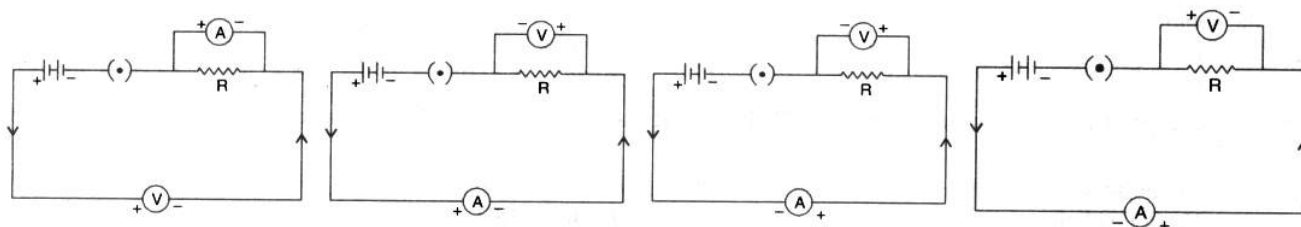
31. A student took Cu, Fe, Zn and Al strips separately in four test tubes labelled I, II, III and IV. He added 10 mL of freshly prepared ferrous sulphate solution to each test tube as shown below : 1



Black residue would be obtained in test tubes

- (a) I and II (b) I and III
 (c) II and III (d) III and IV

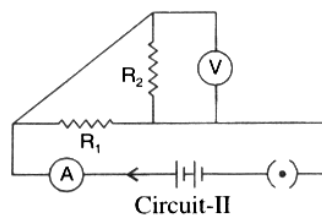
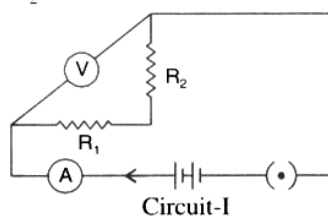
32. Out of the four circuits shown for studying the dependence of the current on the potential difference across a resistor, the correct circuit is 1



- (a) I (b) II
 (c) III (d) IV

33. The resistors R_1 and R_2 are connected in

1



(a) parallel in both circuits.

(b) series in both circuits.

(c) parallel in circuit I and series in circuit II.

(d) series in circuit I and parallel in circuit II.

34. The following ammeters and voltmeters are available in the laboratory to find equivalent resistance of two resistors R_1 and R_2 in parallel :

Ammeters : A_1 of range 0 to 300 mA : Least count 10 mA

A_2 of range 0 to 100 mA : Least count 20 mA

Voltmeters : V_1 of range 0 to 5 V : Least count 0.2 V

V_2 of range 0 to 4 V : Least count 0.4 V

The best combination of voltmeter and ammeter would be

1

(a) ammeter A_1 and voltmeter V_1

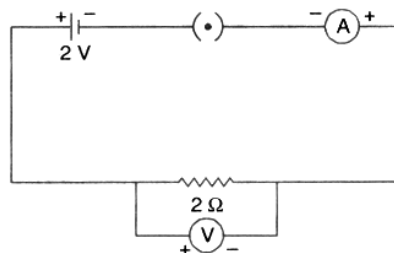
(b) ammeter A_1 and voltmeter V_2

(c) ammeter A_2 and voltmeter V_1

(d) ammeter A_2 and voltmeter V_2

35. In the circuit given below, the voltmeter and ammeter reading are respectively

1



(a) 2 V and 2 A

(b) 1 V and 2 A

(c) 2 V and 1 A

(d) 1 V and 1 A

36. In an experiment to study dependence of current on the potential difference across a given resistor, four students P, Q, R and S kept the plug key in the circuit closed for time t_1 and then open for time t_2 as given in the table below.

1

Student	Closed time t_1 seconds	Open time t_2 seconds
P	15	45
Q	45	15
R	60	30
S	45	30

The best choice of open and closed time is that of student

(a) P

(b) Q

(c) R

(d) S

37. A portion of destarched leaf of a potted plant was covered with a black strip of paper. The plant was exposed to sunlight for six hours and then tested for starch. It was observed that

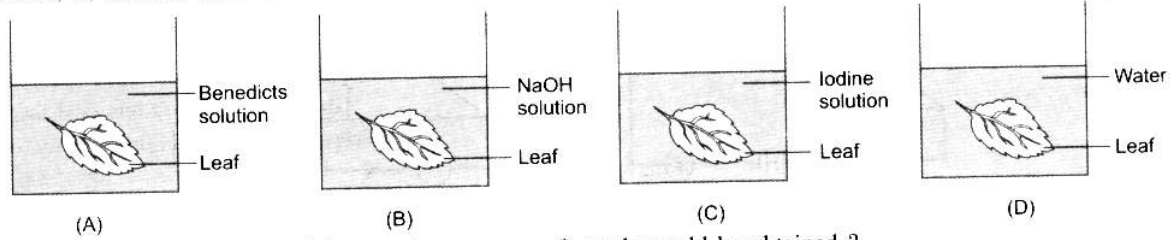
1

(a) both covered and uncovered parts turned blue-black. (b) both covered and uncovered parts turned brownish yellow.

(c) only the uncovered part turned blue-black.

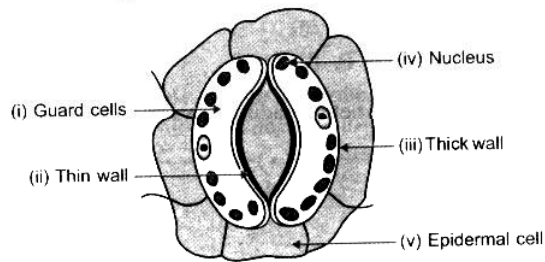
(d) only the covered part turned blue-black.

38. Figures A, B, C and D show leaves that has been boiled in alcohol, placed in four beakers containing liquids as labelled.

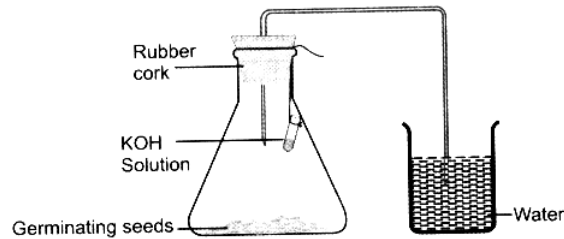


In which one of the above, a positive test for presence of starch would be obtained ?

- (a) A (b) B
(c) C (d) D
39. A well stained leaf peel preparation when focussed under high power of the microscope would show
- (a) epidermal cells, stomata and guard cells, each with one nucleus and many chloroplasts.
(b) epidermal cells, stomata and guard cells, each with many nuclei but one chloroplast.
(c) stomata and guard cells without nuclei or chloroplast.
(d) stomata but no guard cells or epidermal cells.
40. In the following diagram of the stomatal apparatus, which parts are correctly labelled ?



- (a) (i) and (v) (b) (ii) and (v)
(c) (iv) and (ii) (d) (v) and (iv)
41. In the experiment demonstrating respiration in germinating seeds, the water rises in the delivery tube due to
- (a) seeds used up oxygen in the flask. (b) CO_2 is given out by germinating seeds.
(c) germinating seeds suck the water from the beaker. (d) a partial vacuum is created as CO_2 is absorbed by KOH.
42. What is the use of KOH solution in this experiment ?



- (a) Absorbs CO_2 released by germinating seeds. (b) Absorbs O_2 released by germinating seeds.
(c) Absorbs moisture released by the seeds. (d) Provides moisture to germinating seeds.