BUDHA DAL PUBLIC SCHOOL PATIALA

Second Term Examination (10 December 2024)

CLASS X

PAPER- SCIENCE (SET-A)

Time:3 hr. **M.M. 80**

General Instructions:

i) *This question paper consists of 39 questions in 5 sections.*

ii) *All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.*

iii) *Section A consists of 20 objective type questions carrying 1 mark each.*

iv) *Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should be in the range of 30 to 50 words.*

v) *Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should be in the range of 50 to 80 words.*

vi) *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.*

vii) *Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.*

Section – A

Q1. Copper is use for making cooking utensils. Which of the following physical properties of copper is NOT responsible for the same?

a) Malleability b) High melting point c) Thermal conductivity d) High reactivity

Q2. Which of the following property is generally not shown by metals?

a) Electrical conduction b) Sonorous in nature c) Dullness d) Ductility

Q3. A student adds some metallic ash in water taken in a test tube. The ash gets completely dissolved in water and the solution changes colour. What should be student do next to test the chemical properties of the product formed?

a) Test the acidity using a blue litmus paper
b) Test the basicity using a red litmus paper
c) Measure the temperature using a thermometer
d) Evaporate the solution to get crystals.

Q4. If copper is kept open in air, it slowly loses its shining brown surface and gains a green coating. It is due to the formation of

a) $CuSO_4$ b) $CuCO_3$ c) $Cu(NO_3)_2$ d) CuO

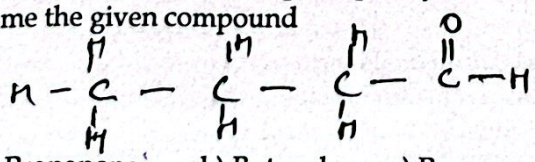
Q5. Ethane with the molecular formula C_2H_6 has :

a) 6 covalent bond b) 7 covalent bond c) 8 covalent bond d) 9 covalent bond

Q6. Which cooking, if the bottom of the vessel is getting blackend on the outside, it means that

a) The food is not cooked completely
b) The fuel is not burning completely
c) The fuel is wet
d) The fuel is burning completely

Q7. Name the given compound (1)



b) Propanone b) Butanal c) Propane d) Butene

A-1

Q8. If there is no formation of egg cell during the development of ovule, then after fertilization which of the following structures will not develop? (1)

a) embryo b) endosperm c) seed d) fruit

Q9. The correct sequence of organs in the male reproductive system for transport of sperm is

a) Testis → Vas deferens → urethra
b) Testis → ureter → urethra
c) Testis → Urethra → ureter
d) Testis → vas deferens → ureter

Q10. When does reshuffling of inherited variations occur?

a) during gametogenesis b) during fertilization
c) during both gametogenesis and fertilization d) during formation of embryo

Q11. In human males all the chromosomes are paired perfectly except one. This/these unpaired chromosome is/are

i) Large chromosome (ii)Small chromosome (iii)Y-chromosome (iv) X-chromosome

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

Q12. In the following given food chain suppose the amount of energy at fourth trophic level is 5kJ, what will be the energy available at the producer level?

Grass → Grasshopper → Frog → Snake → Hawk

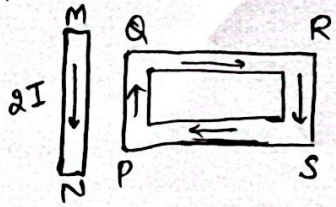
a) 5 kJ b) 50 kJ c) 500 kJ d) 5000 kJ

Q13. Two LED bulbs of 12W and 6W are connected in series. If the current flowing through 6W bulbs is 0.005A, the current that flows through 12W bulb is (1)

a) 0.005 A b) 0.0025 A c) 0.01 A d) 0.02A

Q14. A rectangular loop PQRS carrying a current 2I is situated near a straight conductor MN, such that the conductor is parallel to the side PQ of the loop and is in the plane of loop. If a steady current 2I is established in the conductor as shown, the conductor MN will (1)

(a) Rotate about its axis
(b) Move towards the side PQ of the loop
(c) Move away from the side PQ of the loop
(d) Remain stationary



Q15. Draw the electron dot structure of propanone. (1)

Q16. The decomposers in an ecosystem (1)

a) Convert inorganic material to simpler forms
b) Convert organic materials into organic compounds
c) Convert inorganic materials into organic compounds
d) Do not breakdown organic compounds

For the following questions, two statements are given - one labeled Assertion (A) and the other labeled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below:

a) Both A and R are true and R is the correct explanation of the assertion.
b) Both A and R are true but Reason R is not a correct explanation of Assertion.
c) A is true but R is false.
d) A is false but R is true.

Q17. **Assertion :** Carbon is the only element that can form large number of compounds. (1)
Reason: Carbon is tetravalent and shows the property of catenation.

Q18. **Assertion :** Sugarcane is multiplied by stem cutting. (1)
Reason: A leaf of Bryophyllum forms several plants from buds present in its marginal notches.

A-2

Q19. **Assertion :** Alloys are commonly used in electrical heating devices like electric iron and heater. (1)

Reason : Resistivity of an alloy is generally higher than that of its constituent metals but the alloys have low melting points than their constituent metals.

Q20. **Assertion :** Law of independent assortment can be proved only through monohybrid cross. (1)

Reason : In a dihybrid cross, besides the parent combination of traits, two new recombinants are formed.

Section - B

Q21. a) What are amphoteric oxides? Give example of amphoteric oxide (2)

b) Name the constituents of the following:

(i) Brass (ii) Bronze

Q22. What is binary fission? How is it different between amoeba and leishmania? (2)

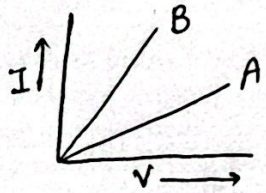
Q23. "It is possible that a trait is inherited but may not be expressed." Give a suitable example to justify this statement. (2)

Q24. What is the function of an Earth wire? Why is it necessary to earth the metallic appliances? (2)

Q25. Two V-I graphs A and B for series and parallel combinations of two resistors are as shown. Giving reason state which graph shows (2)

(a) series

(b) parallel combination of the resistors.



OR

a) Should the resistance of an ammeter be low or high? Give reason.

b) How does use of a fuse wire protect electrical appliances?

Q26. What is biological magnification? Will the levels of this magnification be different at different levels of ecosystems? Explain. (2)

Section - C

Q27. Distinguish between estrification and saponifiaction reactions with the help of the chemical equation for each. State one use of each (i) Esters (ii) soponification process (3)

Q28. An ore has a metal that exist as a liquid at room temperature treatment with dil HCl gives the smell of rotten egg. Name the type of this ore. How can the metal be obtained from its concentrated ore. Write the balanced chemical equations.

OR

a) Write chemical equation for the following reaction : Calcium metal reacts with water

b) Explain the formation of MgO by transfer of electrons (Atomic no. of Mg = 12 and O=8)

c) Give reason : NaCl is not a conductor of electricity in solid state whereas it does conduct electricity in aqueous solution as well as in molten state.

Q29. a) What do you mean by STD? State two bacterial STD infections? (3)

b) Name a surgical method to create a block in the reproductive system for contraception purpose in male and also name the part where blocks are created.

Q30. In a cross between plants with round seeds and plants with wrinkled seeds, the offsprings of F_1 generation had all round seeds. When F_1 generation individuals were self bred, the F_2 generation gave rise to 200 individuals, 150 of which had round seeds. Make a cross and answer the following questions: (3)

a) What are the genotypes of F_2 individuals?

b) What is the ratio of round & wrinkled seeds in F_2 generation?

Q31. a) List two factors on which the magnitude of magnetic field produced by a current carrying straight conductor depends. (3)

b) State the rule which determines the direction of magnetic field in the above case.

c) Draw the patterns of magnetic field lines produced in this case.

Q32. Read the following information. (3)

I) Resistivity of copper is lower than that of aluminum which is turn is lower than that of constantan.

II) Six wires labelled A, B, C, D, E, F have been designed as per the following parameters:

Wire	Length	Diameter	Material	Resistance
A	l	2d	Aluminum	R_1
B	2l	d/2	Constantan	R_2
C	3l	d/2	Constantan	R_3
D	l/2	3d	Copper	R_4
E	2l	2d	Aluminum	R_5
F	l/2	4d	Copper	F_6

Answer the following questions using the above data:

a) Which of the wires has maximum resistance & why?

b) Which of the wires has minimum resistance & why?

c) Arrange R_1, R_3 and R_5 in descending order of their values. Justify your answer.

Q33. a) What is the difference between a direct current and an alternating current? How many times does AC used in India change direction in one second? (3)

b) Draw a pattern of magnetic field formed around a current carrying solenoid. What happens to the magnetic field when the current through the solenoid is reversed.

Section - D

Q34. a) A compound 'X' n heating with excess of concentrated sulphuric acid at 443k gives an unsaturated compound 'Y'. 'X' also reacts with sodium metal to evolve a colourless gas 'Z'. Identify X, Y & Z. Write the equation of the chemical reaction of formation of 'Y' also write the role of sulphuric acid in the equation. (5)

b) Draw the isomers of Hexane

c) Name the third homologue of (i) Ketone (ii) Carboxylic acid

OR

a) Why does micelle formation take place when soap is added to water? Will a micelle be formed in other solvents such as ethanol also.

b) Differentiate between addition reaction and substitution reaction? Give one example of each.

Q35. a) State in brief the functions of the following organs in the human female reproductive system. (5)

(i) Ovary (ii) Fallopian tubes (iii) Uterus

b) Mention the changes which the uterus undergoes when

(i) It has to receive zygote (ii) no fertilisation takes place

OR

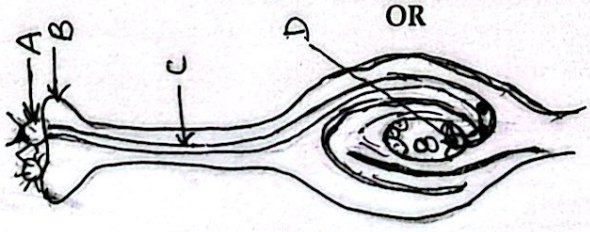


Diagram of part (b)

a) List two reasons for the appearance of variations among the progeny formed by sexual reproduction.

A-4

b) (i) Name the part marked A in the diagram.
(ii) How does 'A' reach part 'B'?
(iii) State the importance of part 'C'
(iv) What happens to the part marked 'D'?
c) What do you mean by triple fusion?

Q36. a) State the law that relates potential difference across a conductor with the current flowing through it? **(5)**

b) An electric bulb is rated at 220V, calculate the energy consumed by 3 such bulbs if they glow continuously for 10 hours for complete month of November. Also calculate the total cost if the rate is Rs. 6.50 per unit.

OR

a) Draw an appropriate schematic diagram showing common Domestic circuits.
b) State Fleming's left Hand Rule.
c) List four properties of magnetic field lines.

Section - E

Q37. **Read the above passage and answer the following questions :** **(4)**

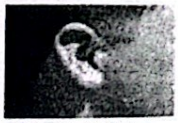
Three metal samples of magnesium, aluminium and iron were taken and rubbed with sand paper. These samples were then put separately in test tubes containing dilute hydrochloric acid. Thermometers were also suspended in each test tube so that their bulbs dipped in the acid. The rate of formation of bubbles was observed. The above activity was repeated with dilute nitric acid and the observations were recorded.

a) When activity was done by dilute hydrochloric acid, then in which one of the test tubes was rate of formation of bubbles the fastest and the thermometer showed the highest temperature?
b) Which metal did not react with dilute hydrochloric acid? Give reason.
c) Why is hydrogen gas not evolved when a metal reacts with dilute nitric acid? Name the ultimate products formed in the reaction.

OR

c) Name the type of reaction on the basis of which reactivity of metals is decided. You have two metals X and Y. How would you decide which is more reactive than the other?

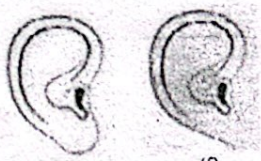
Q38. Figures (a) to (d) given below represent the type of ear lobes present in a family consisting of 2 children - Rahul, Nisha and their parents. (4)


(a) Rahul's Father


(b) Rahul


(c) Rahul's Mother


(d) Rahul's sister Nisha


(e) (f)
Type of ear lobes

Excited by his observation of different types of ear lobes present in his family, Rahul conducted a survey of the type of ear lobes found [Figure (e) and (f)] in his classmates. He found two types of ear lobes in his classmates as per the frequency given below:

Sex	Free	Attached
Male	36	14
Female	31	19

A-5

On the basis of above data answer the following questions.

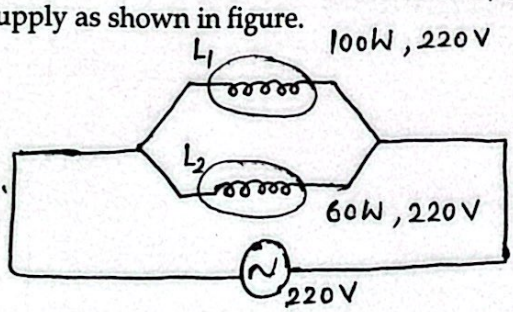
(a) Which of the two characteristics - 'free ear lobe' or 'attached ear lobe' appears to be dominant in this case? Why?

(b) Is the inheritance of the free ear lobe linked with sex of the individual? Give reason for your answer.

(c) What type of ear lobe is present in father, mother, Rahul and his sister Nisha? Write the genetic constitution of each of these family members which explains the inheritance of this character in this family?

Gene for free ear lobe is represented by F and gene for attached ear lobe is represented by f for writing the genetic constitution.

Q39. Two lamps, one rated 100W, 220V and the other 60W, 220V are connected in parallel to electric main supply as shown in figure. **(4)**



(a) Find

(i) Which of the lamp has a higher resistance?

(ii) Which of the lamp will glow brighter?

(b) Find the resistance of L1, if the current is 5A in L1.

(c) Find the current drawn by two bulbs from the line, if the supply voltage is 220V.

OR

(c) If the potential difference between two terminal of an electric lamp is 55V and the current flowing through its element is 5A, then calculate the resistance and wattage of electric lamp.

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