VELAMMAL BODHI CAMPUS
GRAND TEST –III (2023-2024)

CLASS: X **MARKS: 80**
SUBJECT: SCIENCE (BATCH-II) **DURATION: 3Hrs**

General instructions:

i. This question paper consists of 39 questions in 5 sections
ii. All questions are compulsory however and internal choices is provided in some questions a students is expected to attend only one of these questions
iii. Section A consist of 20 objective type questions carrying 1 mark each
iv. Section B consist of 6 VERY SHORT questions carrying 02 mark each. Answer to these questions should be in the range of 30 t0 50 words.
v. Section C consist of 7 SHORT questions carrying 03 mark each. Answer to these questions should be in the range of 50 t0 80 words
vi. Section D consist of 3 long questions carrying 05 mark each. Answer to these questions should be in the range of 80 t0 120 words.
vii. Section E consist of 3 SOURCE/CASE Based units of assessment of 04 marks each with sub parts.

SECTION –A (20X1=20)

1. An alpha particle is moved towards west is deflected towards north by a field. What will be the direction of field?
   a. Towards south b. towards east c. downward d. upward
2. When a person uses a convex lens as a simple magnifying glass, the object must be placed at a distance.
   a) less than one focal length b) more than one focal length
   c) less than twice the focal length d) more than twice the focal length
3. The reaction that differs from the rest of the reaction given is-
   (a) formation of calcium oxide from limestone
   (b) formation of aluminium from aluminium oxide
   (c) formation of sodium carbonate from sodium hydrogen carbonate
   (d) formation of mercury from mercuric oxide
4. Carbon exists in the atmosphere in the form of
   (a) Carbon monoxide only (b) Carbon monoxide in traces and carbon dioxide
   (c) Carbon dioxide only (d) Coal
5. Which of the following substances will not give carbon dioxide on treatment with dilute acid?
   (a) Marble (b) Limestone (c) Baking soda (d) Lime
6. An acid (A) with sodium hydrogen carbonate is used in making the cakes fluffy and spongy. It is due to the release of gas (B) in the reaction. Here, (A) and (B) are:
   (a) (A) : Tartaric acid, (B), O_2 (b) (A) : Oxalic acid, (B), CO_2
   (c) (A) : Tartaric acid, (B). CO_2 (d) (A) : Succinic acid, (B). H_2
7. A dilute ferrous sulphate solution was gradually added to the beaker containing acidified permanganate solution. The light purple colour of the solution fades and finally disappears. Which of the following is the correct explanation for the observation?
   (a) $KMnO_4$ is an oxidising agent, it oxidises $FeSO_4$.

(b) FeSO4 acts as an oxidising agent and oxidises $KMnO_4$.
(c) The colour disappears due to dilution; no reaction is involved.
(d) $KMnO_4$ is an unstable compound and decomposes in presence of $FeSO_4$ to a colourless compound.

8. An element reacts with oxygen to give a compound with a high melting point. This compound is also soluble in water. The element is likely to be
(a) calcium (b) carbon (c)silicon (d) iron

9. Identify the correct order of reactivity of metals among the following:
(a) Fe<Zn< Cu < Na< Al (b) Cu < Fe< Zn < Al< Na
(c) Cu< Zn< Al < Na< Fe (d) Zn < Cu < Fe <Al< Na

10. Generally food is broken and absorbed within the body of organisms. In which of the following organisms is it done outside the body?
a) Amoeba b) Mushroom c) Paramoecium d) Lice

11. Receptors are usually located in sense organs. Gustatory receptors are present in
a) Tongue b) Nose c) Eye d) Ear

12. A farmer wants to grow banana plants genetically similar enough to the plants already available in his field. Which one of the following methods would you suggest for this purpose?
a) Regeneration b) Budding c) Vegetative propagation d) Sexual reproduction

13. If a tall pea plant is crossed with a pure dwarf pea plant then, what percentage of F_1 and F_2 generation respectively will be tall?
(a) 25%, 25% (b) 50%, 50% (c) 75%, 100% (d) 100%, 75

14. Nastic movements are non-directional responses to the stimuli. These movements are independent of the direction of the stimulus. On the other hand, growth movements which occur in the direction of the stimulus are called tropic movements.
Which of the following movements is a nastic movement?
(a) Closing up of leaves of a sensitive plant on being touched with an object.
(b) Bending of shoot of a plant in response to light.
(c) Movement of root of a plant towards a source of water.
(d) Climbing up of a plant on an object by using tendrils.

15. Changes that occur in girls during puberty is listed below:
(i) Increases in the size of the breasts. ii) Beginning of menstruation.
(iii) Darkening of skin around the nipples.
What is the likely significance of these changes?
(a) Sexual maturation (b) Aging of the body
(c) Abnormal division of the cells (d) Production of germ cells

16. What will happen if deer is missing in the given food chain? Grass → Deer → Tiger
a) the population of tiger decreases and the population of grass increases
b) the population of grass decreases
c) tiger will start eating grass d) the population of tiger increases

17. Assertion: A chemical reaction becomes faster at higher temperatures.
Reason: At higher temperatures, molecular motion becomes more rapid.
(a) Both Assertion and Reason are True and Reason is the correct explanation of the Assertion.
(b) Both Assertion and Reason are True but Reason is not the Correct explanation of the Assertion.
(c) Assertion is True but the Reason is False.
(d) Both Assertion and Reason are False.

18. Assertion: Height in pea plants is controlled by efficiency of enzymes and is thus genetically controlled.
Reason: Cellular DNA is the information source for making proteins in the cell.
(a) Both Assertion and Reason are True and Reason is the correct explanation of the Assertion.
(b) Both Assertion and Reason are True but Reason is not the Correct explanation of the Assertion.
(c) Assertion is True but the Reason is False.
(d) Both Assertion and Reason are False.

19. Assertion: Biodegradable substances result in the formation of compost and natural replenishment.
Reason: It is due to breakdown of complex inorganic substances into simple organic substances.
(a) Both Assertion and Reason are True and Reason is the correct explanation of the Assertion.
(b) Both Assertion and Reason are True but Reason is not the Correct explanation of the Assertion.
(c) Assertion is True but the Reason is False.
(d) Both Assertion and Reason are False.

20. Assertion (A): When the length of a wire is doubled, then its resistance also gets doubled.
Reason (R): The resistance of a wire is directly proportional to its length.
(a) Both Assertion and Reason are True and Reason is the correct explanation of the Assertion.
(b) Both Assertion and Reason are True but Reason is not the Correct explanation of the Assertion.
(c) Assertion is True but the Reason is False.
(d) Both Assertion and Reason are False.

SECTION –B (6X2=12 marks)

21. A person is not able to see distinctly the objects placed beyond 90 cm from him. Giving reasons to identify the defect in his eye. Determine the nature of lens used to correct this defect

22. What is the power of lens having a focal length of (a) 50cm (b) -50 cm

23. State the post-fertilisation changes that lead to fruit formation in plants.

24. Write the chemical formula and name of the compound which is the active ingredient of all alcoholic drinks. Write chemical equation when this compound reacts with hot concentrated sulphuric acid.

25. What is the purpose of making urine in the human body? Name the organs that stores and releases the urine.

(OR)

Why do arteries have thick and elastic walls whereas veins have valves?

26. What is feedback mechanism of hormonic regulation? Take the example of insulin to explain this phenomenon .

SECTION –C (7X3=21 marks)

27. A current-carrying conductor experiences a force when placed in a magentic field. What happens to the force when:
(i) the current is reversed and (ii) current is doubled
(iii) the magnetic field reversed

28. An electric heater draws a current of 10A from a 220V supply. What is the cost of using the heater for 5 hrs everyday for 30days if the cost of 1 unit is Rs. 5.20?

29. (a) Define Refraction.
(b) A ray of light incident an one face of a rectangular glass slab emerges from the opposite face of the slab parallel to the direction of the incident ray. Why does it happen so?

30. The general formula of three compounds A, B and C is CnH_{2n+2} B has highest boiling point and C has lowest boiling point.
(i) Name the homologous series to which A, B and C belongs?
(ii) Which of these have minimum number of carbon atom?
(iii) Write the name and molecular formula of 4^{th} member of this homologous series?

31. An organic compound A is widely used as a preservative in pickles and has a molecular formula $C_2H_4O_2$. This compound reacts with ethanol to form a sweet smelling compound B.
(a) Identify the compound A.
(b) Write the chemical equation for the reaction with ethanol to form compound B.
(c) How can we get compound A from B?

(OR)

Anhydrous copper sulphate ($CuSO_4$) was dissolved in one beaker and hydrated copper sulphate ($CuSO_4 .5H_2O$) was dissolved in another beaker. What heat changes do you expect in these beakers and why?

32. Write one example of each of the following tropic movements:
(i) Positive phototropism. (ii) Negative phototropism.
(iii) Positive geotropism. (iv) Negative geotropism.
(v) Hydrotropism. (vi) Chemotropism.

(OR)

(i) Name the part of human brain which controls.
(a) voluntary actions and (b) involuntary actions
(ii) Write the function of peripheral nervous system. Name the components of this system stating their origin.

33. What is the probability of a girl or a boy being born in a family? Justify your answer.

SECTION –D (3X5=15 marks)

34. (a) Size of image of an object by a mirror having a focal length of 20 cm is observed to be reduced to 1/3rd of its size. At what distance the object has been placed from the mirror? What is the nature of the image and the mirror?
(b) State the laws of refraction.

35. Lead nitrate solution is added to a test tube containing potassium iodide solution.
(a) Write the name and colour of the compound precipitated.
(b) Write the balanced chemical equation for the reaction involved.
(c) Name the type of this reaction justifying your answer.

(OR)

(i) Crystals of a substance changed their colour on heating in a closed test tube but regained it after sometime when they were allowed to cool down. Name the substance, write its formula and explain the phenomenon involved.

(ii) Name the compound whose one formula unit is associated with 10 water molecules. How is it prepared? Give equations of related reactions. Give two uses of the compound.

36. Given below are certain situations. Analyze and describe its possible impact on a person:

a) Testes of a male boy are not able to descend into scrotum during his embryonic development.

b) Vas deferens of a man is plugged.

c) Prostate and seminal vesicles are not functional.

d) Egg is not fertilised in a human female.

e) Placenta does not attach to the uterus optimal

(OR)

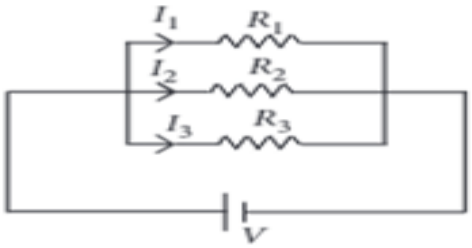
a) A doctor has advised Sameer to reduce sugar intake in his diet and do regular exercise after checking his blood test reports. Which disease do you think Sameer is suffering from? Name the hormone responsible for this disease and the organ producing the hormone.

b) Identify the hormone present in the areas of rapid cell division in a plant and the hormone inhibits growth?

SECTION-E (3X4=12 MARKS)

37. Two or more resistance are connected in such a way that the same potential difference gets applied to each of them then they are said to connected in parallel. The current flowing through the two resistance in parallel is however not the same when we have two or more resistance joint in parallel to each other then the same current gets additional paths to flow and the overall resistance decreases. The equivalent resistance is given by

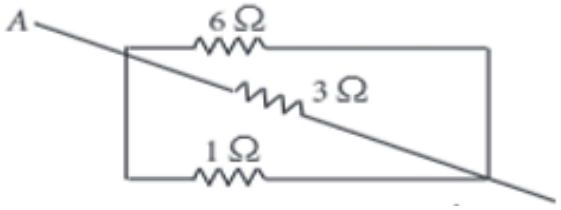
$$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$$



(i) Three resistance 2Ω, 6Ω and 8Ω are connected in parallel, then the equivalent resistance is

(ii) A wire of resistance 12Ω is cut in to 3 equal pieces and then twisted the their ends together the equivalent resistance is

(iii) Three resistance are connected as shown. The equivalent resistance between a and b is



38. There are different types of chemical reactions occurring around us or being carried out for the benefit of mankind, e.g. combination reactions, decomposition reactions, displacement reactions, precipitation reactions, reduction-oxidation (redox) reactions, photochemical reactions etc. Now, answer the following questions:
(i) Combustion of coke is a combination reaction. CO_2 is not a pollutant. Then, why is combustion of coke harmful?
(ii) Which reaction followed by two combination reactions are involved in white wash of walls?
(iii) Give one use of tin plating in daily life.
(iv) How photochemical reactions have played an important in photography?

39. The small intestine is the tubular structure within the abdominal cavity that carries the food in continuation with the stomach up to the colon from where the large intestine carries it to rectum and out of the body the main function of these organ is to aid in digestion. All nutrients are usually absorbed into blood across the mucosa of the small intestine. In addition, the small intestine absorbs water and electrolytes, thus playing critical role in maintenance of body water and acid base balance.
(i) Which of the following is incorrect regarding intestinal villi?
(ii)Which enzymes are likely to act on the baked potatoes eaten by a man starting from the mouth as they move down on the alimentary canal?
(iii) After surgical removal of an infected gallbladder a person must be especially careful to restrict dietary in take.
iv. The given flow chart shows the fate of carbohydrates during digestion in the alimentary canal. Identify the enzymes acting at stages indicated as A, B, C and D.