NATIONAL PUBLIC SCHOOL
BENGALURU
PERIODIC TEST- 3-2019 -20
SCIENCE

Class: 10
No. of pages: 8

Max Marks: 80
Time: 3 Hrs

General Instructions

- The question paper comprises three sections – A, B and C. Attempt all the sections.
- All questions are compulsory.
- Internal choice is given in each section.
- All questions in Section A are one-mark questions comprising MCQ, VSA type and assertion-reason type questions. They are to be answered in one word or in one sentence.
- All questions in Section B are three-mark, short answer type questions. They are to be answered in 50 – 60 words each.
- All questions in Section C are five-mark, long answer type questions. They are to be answered in 80 – 90 words each.
- The question paper consists of a total of 30 questions.

SECTION A

1. How does atomic size of an element vary across a period and down a group? 1

2. Mention two main factors responsible for versatile nature of carbon. 1

3. **Answer question numbers 3(a) – 3(d) on the basis of your understanding of the following paragraph and the related studied concepts.**

Ocean can produce two types of energy - thermal energy from sun's heat and mechanical energy from the tides and waves. The sun's heat warms the surface water a lot more than the deep ocean water and this temperature difference creates thermal energy. Ocean thermal energy conversion (OTEC) uses this thermal energy to run a heat engine and produce electricity. The unequal solar heating of the Earth generates wind and wind blowing over water generates waves. Tides are driven primarily by the gravitational pull of the moon.

3(a) Mention three different ways of harnessing energy from ocean. 1
3(b) State the principle of working of OTEC 1
3(c) Name one renewable source of energy for which Sun is not the direct or indirect source of energy? 1
3(d) Mention one disadvantage of energy derived from oceans. 1

4. **Answer question numbers 4(a) to 4(d) are based on the information given below in the table. Study the table and answer the questions that follow:**

Normal blood Pressure of a person : 80/120 mm Hg.

Table: Approx. Ideal BP according to Age Chart:

AGE	FEMALE	MALE
10	111/73	112/73
14	120/75	120/77
19-24	125/77	125/79
40-45	130/83	135/83
50-55	145/85	147/85
60+	150/85	152/85

(a) Refer to table showing the blood pressure of male and female. Infer the disease which can be diagnosed in a boy of 14 years who have same blood pressure as a 60 year old man. 1

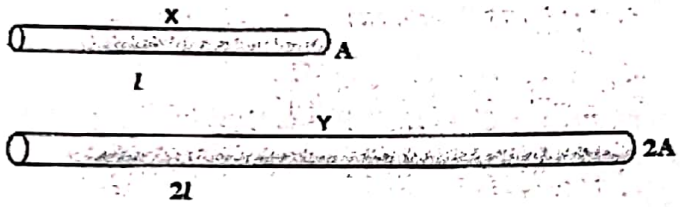
(b) Identify the hormone whose level in the blood is responsible for raise in blood pressure in certain situations. 1

(c) Which of the following trend in blood pressure range is seen with advancement of age from teenage to old age? 1

(i) Increase (ii) Remains same (iii) Decrease (iv) Fluctuates.

(d) What does chronic high blood pressure lead to? 1

5. Two wires, X and Y are made of same metal and are at the same temperature. Y is twice as long as X and has twice the cross - sectional area. 1



Which of the following is correct?

i) X and Y have the same resistance.

ii) X has half the resistance of Y.

iii) X has double the resistance of Y.

iv) X has four times the resistance of Y.

6. A current of 1 A is drawn by a filament of an electric bulb. Number of electrons passing through a cross section of the filament in 16 seconds would be roughly 1

i) 10^{20} ii) 10^{16}

iii) 10^{18} iv) 10^{23}

7. Which part of the solar cooker is responsible for greenhouse effect? 1

i) Coating with black colour inside the box.

ii) Mirror

iii) Glass sheet

iv) Outer cover of the solar cooker.

8. The important message conveyed by the 'Chipko Movement' is: 1

i) To involve the community in forest conservation efforts.
ii) To ignore the community in forest conservation efforts.
iii) To cut down forest trees for developmental activities.
iv) Government agencies have the unquestionable right to order destruction of trees in forests.

OR

Ground water will not be depleted due to:

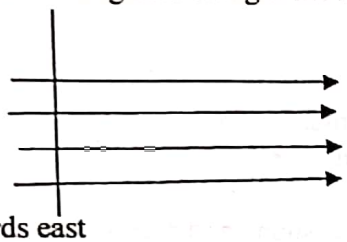
i) Afforestation.
ii) Thermal power plants.
iii) Loss of forest and decreased rainfall.
iv) Cropping of high-water demanding crops

9. When current is parallel to magnetic field, then force experienced by the current carrying conductor placed in uniform magnetic field is 1

i) twice to that when angle is 60^0.
ii) thrice to that when angle is 60^0.
iii) Zero.
iv) Infinite.

OR

A wire is lying horizontally in the north-south direction and there is a horizontal magnetic field pointing towards east. Some positive charges in the wire move north and an equal number of negative charges move south. The direction of force on the wire will be



i) towards east
ii) downwards into the page
iii) upwards, out of the page
iv) towards west

10. The law of octaves was found to be applicable up to which element? 1

i) Oxygen
ii) Calcium
iii) Cobalt
iv) Potassium

OR

An element has 12 protons. The group and period to which this element belongs to is

i) 2^{nd} group, 3^{rd} period.
ii) 2^{nd} group, 2^{nd} period
iii) 3^{rd} group, 2^{nd} period.
iv) 3^{rd} group,3^{rd} period.

11. Which of the following is (are) an endothermic process(es)? 1

a. Dilution of sulphuric acid
b. Sublimation of dry ice
c. Condensation of water vapours
d. Evaporation of water.

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

12. Which one of the following can be used as an acid-base indicator by a visually impaired person? 1

i) Litmus solution.
ii) Turmeric.
iii) Vanilla essence.
iv) Petunia leaves.

For questions 13 and 14, two statements are given – one labelled *Assertion* (A) and the other labelled *Reason* (R). Select the correct answer to these questions from the codes (i), (ii), (iii) and (iv) as given below

i) Both A and R are true and R is the correct explanation of the assertion.
ii) Both A and R are true and R is not the correct explanation of the assertion.
iii) A is true but R is false.
iv) A is false but R is true.

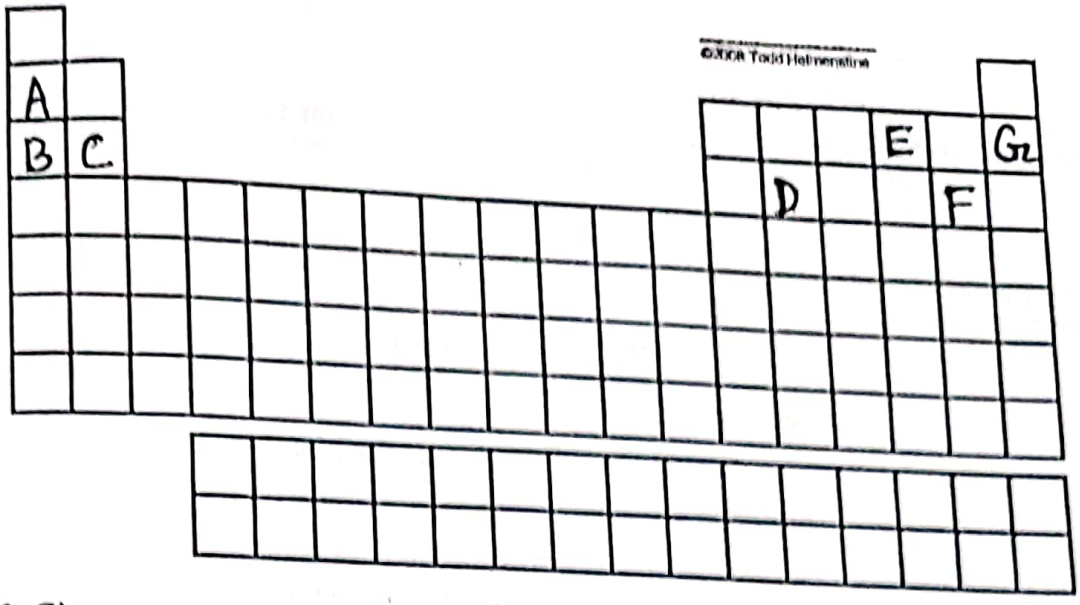
13. **Assertion:** Camphor gives yellow sooty flame. 1
Reason: Camphor contains unsaturated hydrocarbon. (i)

14. **Assertion:** A rainbow appears only when it is sunny and raining at the same time.
Reason: Water droplets help in scattering of the light. (iii)

SECTION B

15. In the following table, six elements A, B, C, D, E and F of the modern periodic table are given: 3

i) Which one of them is a) Noble gas b) halogen
ii) Which of them is the most active metal in 3rd period?
iii) Identify the most electronegative element in the third period.



16. Give reasons:
    i) For dilution of acid, acid is added to water and not water to acid. 3
    ii) Ammonia solution is basic in nature.
    iii) Doctors suggest use of toothpaste to prevent tooth decay.

OR

i) A white coloured compound X becomes hard on mixing proper quantity of water. It is also used to maintain broken bones in fixed position. Identify X. Write its chemical formula. (½ + ½)

ii) Write the balanced chemical equation to show what happens when water is added to this compound in proper quantity. Mention any other use of compound X. (1 +1)

17. On heating a metal nitrateA in boiling tube, yellowish brown coloured metal oxide B, Oxygen gas and a brown gas C are formed. (1+1 ½ + ½)
    i) Write the balanced chemical equation of the reaction.
    ii) Identify the compounds A, B and C.
    iii) State the nature of aqueous solution of gas C.

18. Compare and contrast nervous and hormonal mechanisms for control and coordination in animals. 3

19. How did Mendel prove that traits are independently inherited? 3

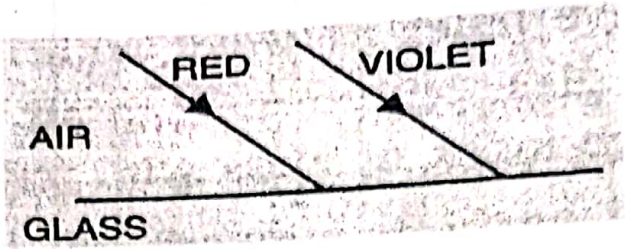
OR

Describe any three ways in which individuals with a particular trait may increase in population.

20. What is meant by biodiversity? List any two advantages of conserving forests and wildlife. 3

21. i) Draw a labelled diagram of a cross section of a leaf and label any two parts. (2+1)
ii) How do the desert plants take up CO_2 and perform photosynthesis?

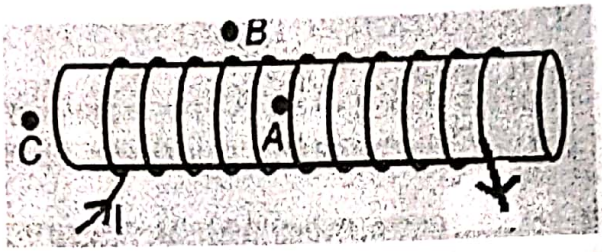
22. Two parallel rays of red and violet light are incident from air on air -glass boundary as shown the figure. 3



i) Complete the diagram showing the refracted rays for them in the glass.
ii) Are refracted rays in glass parallel? Give reason for your answer.
iii) Compare the speeds of the two rays in the glass.

(1+1+1)

23. For the current carrying solenoid as shown below,



i) Draw magnetic field lines.
ii) Mark the poles of the magnet.
iii) Out of the three points, A, B and C, at which point is the magnetic field strength maximum and at which point is it minimum?

OR

How will the magnetic field produced at a point due to a current carrying circular coil change if we:
(i) Increase the current flowing through the coil?
(ii) Reverse direction of current through the coil?
(iii)Increase the number of turns in the coil?

24. i) Name the type of defect of vision a person is suffering from, if he uses convex lens in his spectacles for the correction of his vision. (½ + 1+1½)
ii) List two causes of this defect.
iii) Draw a diagram to show the correction of this defect.

SECTION C

25. A metal X is placed low in reactivity series and is liquid at room temperature, it is found to exist in its ore Y. Identify X and Y. Outline the process of extraction of metal X from Y. Support your answer with balanced chemical equations. (1+2)
Name an alloy which is used for welding electrical wires together. Mention one property of it. (1+1)

26. Write the IUPAC name of the following compounds: (3+2)
    i) $CH_3CH_2CH_2CH_2OH$
    ii) CH_3CH_2CHO
    iii) $CH_3COCH_2CH_3$

    Give reasons:
    i) A mixture of ethyne and oxygen is burnt for welding.
    ii) Ethanoic acid is called glacial acetic acid.

OR

Four organic compounds A, B, C and D have molecular formulae C_3H_6, CH_3COOH, C_2H_5OH and C_4H_{10} respectively.

i) Which one of these compounds A, B, C or D is a member of alkene homologous series? Write its general molecular formula. (½ + ½)
ii) Identify the alcohol and carboxylic acid from A,B,C and D. (½ + ½)
iii) Give the chemical equation when B and C react with each other in presence of concentrated sulphuric acid. Mention a characteristic feature of the major product formed. 2
iv) Identify the saturated hydrocarbon. Mention its IUPAC name. (½ + ½)

27. i) Write the functions of each of the following parts in a human female reproductive system: (3+2)
    a) Ovary b) Uterus c) Fallopian tube.
    ii) Write the structure and functions of placenta in a human female.

OR

i) In the context of reproduction of species, State the main difference between fission and fragmentation. Give one example of each.
ii) Why is DNA copying an essential part of the process of reproduction? Give any one advantage of sexual reproduction over asexual reproduction.

28. i) How is oxygen and carbon dioxide transported in human beings? (3+ 2)
    iii) What is the significance of residual volume of air in the lungs during a breathing cycle?

29. Two lamps, one rated at 40 W – 220 V and other at 60 W – 220 V are connected in parallel to the electricity supply at 220 V. (1 ½ + 2 ½ + 1)
    i) Draw a circuit diagram to show the connections.
    ii) Calculate the current drawn from the electric supply source.
    iii) Calculate the total energy consumed by the two lamps together when they operate for one hour.

30. Analyze the following observation table showing variation of image distance (v) with object distance (u) in case of a convex lens and answer the following questions without doing any calculations: (1+ 1 + 3)

S.No	Object distance u (cm)	Image distance v (cm)
1	-100	+ 25
2	-60	+ 30
3	-40	+ 40
4	-30	+ 60
5	-25	+ 100
6	-15	+ 120

i) What is the focal length of the convex lens? Give reason to justify your answer.
ii) Write the serial number of the observation which is not correct. On what basis have you arrived at this conclusion?
iii) Draw a ray diagram for the observation at serial number 4. Also find the appropriate value of magnification.

OR

i) The magnification of an image formed by a lens is - 1. If the distance of the image from the optical centre of the lens is 25 cm, where is the object placed?
ii) Find the nature and focal length of the lens.
iii) Draw a ray diagram to justify your answer. Mention the nature of the image.

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