

VISHWA BHARATI PUBLIC SCHOOL, NOIDA
I PRE-BOARD EXAMINATION, 2020-21

CLASS- X
Science (086) Theory

TIME: 3hrs +30mins
Maximum Marks: 80

General Instructions:

- (i) The question paper comprises four sections A, B, C and D. There are 36 questions in the question paper. All questions are compulsory.
- (ii) Section–A - question no. 1 to 20 - all questions and parts thereof are of one mark each. These questions contain multiple choice questions (MCQs), very short answer questions and assertion - reason type questions. Answers to these should be given in one word or one sentence.
- (iii) Section–B - question no. 21 to 26 are short answer type questions, carrying 2 marks each. Answers to these questions should be in the range of 30 to 50 words.
- (iv) Section–C - question no. 27 to 33 are short answer type questions, carrying 3 marks each. Answers to these questions should be in the range of 50 to 80 words.
- (v) Section–D – question no. - 34 to 36 are long answer type questions carrying 5 marks each. Answer to these questions should be in the range of 80 to 120 words.
- (vi) There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.
- (vii) Wherever necessary, neat and properly labeled diagrams should be drawn.

SECTION- A

Q1. Mention two properties common to the elements in the same group.

OR

Mention two properties of the elements that change down the group.

Q2. Give one example of a reaction in which reaction conditions like temperature/ pressure / catalyst is required for the reaction to take place.

Q3. Assertion (A) : The decomposition reaction which is used in black and white photography, produces a grey solid.

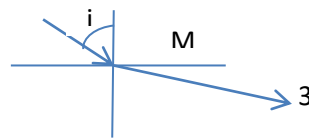
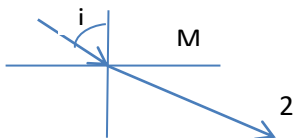
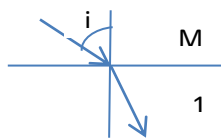
Reason (R) : The reactant decomposes to form a grey salt.

Choose the correct answer from (a), (b), (c), (d).

(a) Both A and R are true and R is the correct reason of A. (b) Both A and R are true and R is not the correct reason of A. (c) A is true but R is false. (d) A is false but R is true.

Q4. Give one example of a strong base and a weak base indicating their pH.

Q5. The ray diagrams given below show the paths of a ray of light travelling from medium M into different media 1, 2 and 3. In which of three media 1, 2 and 3 does light travel fastest?



Q6. The refractive index of medium x with respect to medium y is $n(xy)$, the refractive index of medium y with respect to medium z is $n(yz)$, and the refractive index of medium z with respect to medium x is $n(zx)$. If $n(xy) = 2/3$, $n(yz) = 4/3$, what is $n(zx)$?

Q7. The planets do not twinkle. Explain.

Q8. Name and state the rule which gives the direction of force experienced by a current carrying conductor placed in a magnetic field.

Q9. Generate the general formula of alkynes and write the formula of 3rd member of homologous series of alkynes.

Q10. Write the function of split ring commutator in DC motor.

Q11. A student observed a permanent slide showing asexual reproduction in yeast. Draw diagrams of the observations he must have made from the slide. Name the process also.

Q12. The following organisms form a food chain. Insect, Hawk, Grass, Snake, Frog Which of these will have highest concentration of non-biodegradable chemicals? Name the phenomenon.

OR

“Human beings occupy the top level in any food chain.” What are the consequences of this on our body?

Q13. Rajesh is admitted in an ICU(Intensive Care Unit) after cardiac arrest. Due to restricted blood flow to the kidneys the activity of his kidneys have reduced leading to accumulation of waste in his body. What measure should be taken immediately to save his life?

OR

A player experiences sudden cramps in his legs after a sprint. Give reason for it

Q14. In what form is carbohydrate stored in plants and animals?

For question numbers 15 and 16, 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 correct explanation of the assertion.

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

c) A is true, but R is false.

d) A is false, but R is true.

Q15. Assertion-Rate of breathing in aquatic organisms is faster

Reason -Amount of dissolved oxygen is fairly low than the oxygen in air

Q16. Assertion-Separation of left side and right side of the heart keep oxygenated and deoxygenated blood from mixing.

Reason-Ventricles have thicker muscular walls .

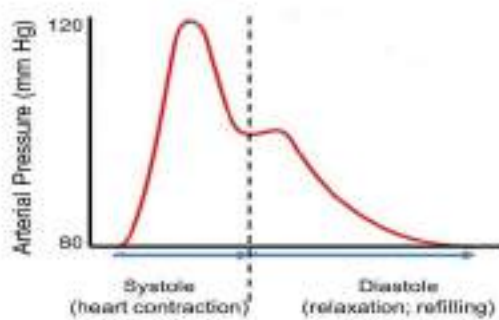
Q17. Read the following and answer any four questions from 17 (i) to 17 (v)

A 62 year old African-American woman with prediabetes presents for her annual physical. She has no complaints. The average of 2 BP readings in her right arm is BP 143/88.

i What is the disease she is suffering from?

- a. Cardio vascular disease
- b. Hypertension
- c. Diabetes
- d. Blood disorder

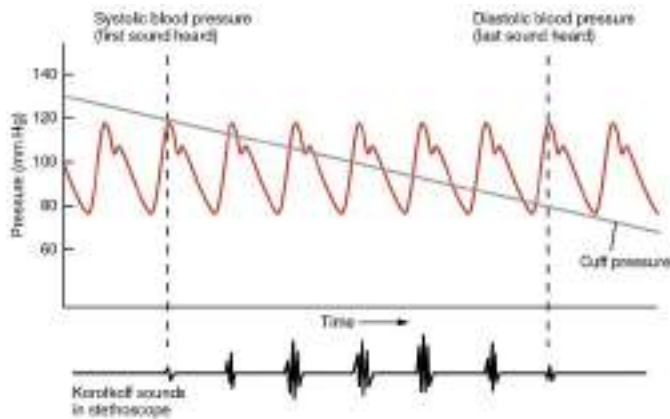
ii



The graph above indicates blood pressure at time T for an individual. What can you infer ?

- a. Blood pressure is below normal
- b. Blood pressure is above normal
- c. Blood pressure is normal
- d. No inference

iii



During measurement with the help of sphygmomanometer sound is audible in stethoscope when the blood pressure in the artery of arm is

- Above 120mmHg
- Between 120mmHg-80mmHg
- Below 80mmHg
- None of the above

Iv



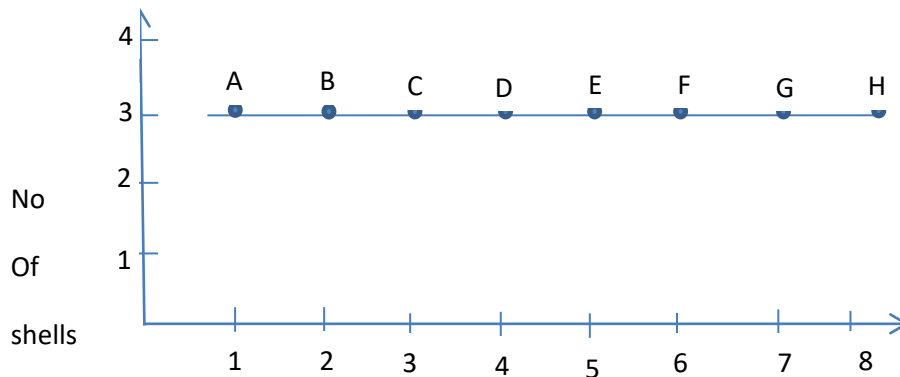
Which activity of the day is associated with lowest diastolic pressure

- Volunteer work
 - On computer at home
 - Sleeping
 - Answering e mail
- v. Why does the blood pressure increase?

- Arteries inflate leading to decrease in resistance to blood flow

- b Arteries constrict leading to increase in resistance to blood flow
- c Ventricles constrict leading to increase in resistance to blood flow
- d None of the above

Q18. Atoms of eight elements (A-H) have same number of shells but different number of valence electrons. There are **five subparts**. Answer any four questions from 18 (i) to 18 (v)



→ No of Valence-e

- (i) Name the compound formed by A and G. What is the nature of the compound?
- (ii) Write the formulae of oxides of A and F.
- (iii) Which one is likely to be most electro-negative and what is its valency?
- (iv) Which one is bigger in size, B or E ? Justify.
- (v) How the metallic character changes from A to G ? Give reason.

Q19.



Images can be formed by the reflection of light from smooth curved surfaces like doorknobs, taps, utensils etc. In spoons, one surface is curved inward while the other bulges out. Different kinds of images

will be formed depending on which surface of the spoon you are looking at and its distance from your face. Hold a large, shiny spoon at a distance from a lighted candle and **for each side** of the spoon, answer the following:

- (i) Is the image formed erect / inverted ?
- (ii) What is the size of the image compared to that of the candle ?
- (iii) Change the distance between the spoon and the candle. Does the size of the image change?
- (iv) As you bring the spoon close to the candle, does the image of the candle disappear at a certain distance? Why?

Q20.



In an induction cook-top, a coil of copper wire is placed underneath the glass ceramic and an alternating electric current is passed through it. When the current passes through the coil, a magnetic field is produced and this keeps changing its direction. The resulting changing (AC) magnetic field induces a small circular electric current (eddy current) inside the metal cookware as field lines cut through the surface of the cooktop. The induced current flowing through the resistance of the cookware results in resistive heating. Induction tops typically will not heat copper or aluminium vessels because a magnetic field cannot produce a concentrated current. A cooking vessel must be made of ferrous metal such as cast iron/ stainless steel. The iron in the vessel concentrates the current to produce heat in the metal. If the metal is too thin the heating will not be effective.

There are **five subparts**. Answer any four questions from 20 (i) to 20 (v).

- (i) What are two properties of copper due to which it is used in the cooktop?
- (ii) How is eddy current produced?
- (iii) Can any metal-pan be used with cooktop? Why?
- (iv) Define resistance and S.I. unit of resistance.
- (v) Why heating will not be effective if the metal is too thin?

SECTION- B

Q21. The gene for red hair is recessive to the gene for black hair. What will be the hair colour of a child if he inherits a gene for red colour from his mother and a gene for black hair from his father? Express with the help of flow chart.

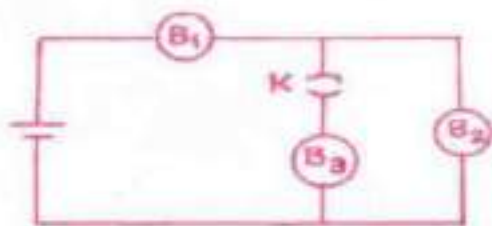
OR

What are the possibilities of blood group in offspring when a male homozygous for blood group B marries a female heterozygous for blood group A. Show cross.

Q22. How does the placenta form? Give any two functions of placenta.

Q23. A concave mirror is placed at a distance of 30cm from an object. The image formed is $\frac{1}{3}$ rd the size of the object. Find the focal length of the mirror and mention the nature of image.

Q24. A cell is connected to three identical bulbs B₁, B₂ and B₃ as shown in the figure. Compare the currents passing through each bulb when (i) the switch is open and (ii) the switch is closed. Give reason for your answer.



Q25. Write one point of (i) similarity in physical property of silver and iodine (ii) difference between chemical properties of iron and carbon.

Q26. Draw the electron dot structure of saturated hydrocarbon with two carbons and name the compound.

SECTION- C

Q27. List two functions each of the following parts of human female reproductive system

- a) Ovaries
- b) Fallopian tubes
- c) Uterus

Q28. The flow of energy between various components of the environment has been extensively studied. List three findings.

Q29. How is urine formed and which factors control the amount of urine formed?

Q30. What are structural isomers? Draw two structures of complete molecules of C₄H₁₀.

OR

Draw the structure of complete molecules of the following: (i) straight chain unsaturated hydrocarbon with 6-carbons, (ii) cyclohexane, (iii) benzene.

Q31. Aluminium, copper, iron and magnesium metal samples are collected and heated over a flame.

(i) Which metal burns easily and what is the colour of the flame?

(ii) Which of the products obtained on heating form alkali? Give reaction.

(iii) When dilute acid is added to the metal samples separately, which one reacts most vigorously and which one does not react? Explain on what basis you can conclude that.

Q32. Explain how could the Modern Periodic table remove three anomalies of Mendeleev's Periodic Table?

OR

How does the electronic configuration of an atom relate to its position in the Modern Periodic Table? Explain with an example.

Q33. You have two lenses A ($f = -10\text{cm}$) and B ($f = +10\text{cm}$). Which of the two can be used as magnifying glass and what is its power? Find the position of the image if an object is placed at 8cm from the lens? Draw a ray diagram to justify your answer.

SECTION- D

Q34. (i) A 25 ohm resistance wire is doubled on it. Calculate the new resistance.

(ii) If 100J of heat is produced each second by the original resistance wire, find the potential difference across it.

(iii) If the length of the resistance wire is 1m and the radius is 0.8 mm, what will be the resistivity of the metal?

Q35. (i) How can you conclude that non-metallic oxides are acidic in nature? Explain giving chemical equation.

(ii) What happens when 1g of solid NaCl is mixed with conc H_2SO_4 ?

(iii) What do you observe when the product evolved in the reaction mentioned in (ii), is tested with a dry and a wet blue litmus paper? Give reason. If the climate is very humid, what precaution should be taken before performing the above test with dry litmus paper ?

Q36. (a) Write the reaction that occurs when glucose breaks down anaerobically in yeast. (b) Write the mechanism by which fishes breath in water. (c) Name the balloon like structures present in lungs. List its two functions. (d) Name the respiratory pigment and write its role in human beings.

