

KULAPATI MUNSHI BHAVAN'S VIDYA MANDIR, POTTORE



MODEL EXAMINATION - 2017

SCIENCE

Grade: 10

Date: 23-01-2017

Time: 3 Hours

Marks: 90

**General Instructions:**

- (i) The question paper comprises of **two sections, A and B**. You are to attempt both the sections.
- (ii) All questions are **compulsory**.
- (iii) There is no choice in any of the question.
- (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** question. These are to be answered in one word or one sentence.
- (vi) Question numbers **4 to 6** are **two mark** questions, to be answered in about 30 words each.
- (vii) Question numbers **7 to 18** are **three mark** questions, to be answered in about 50 words each.
- (viii) Question numbers **19 to 24** are **five mark** questions, to be answered in about 70 words each.
- (ix) Question numbers **25 to 33** are **multiple choice questions** based on practical skills and each question carries **one mark**.
- (x) Question numbers **34 to 36** are **explanatory questions** based on practical skills and each carry **two marks**.
- (xi) The question paper contains **value based questions** to the extent of **3-5 marks**.

**SECTION - A**

1. Draw the structure of an alcohol with five carbon atoms with functional group at second carbon atom. Write its IUPAC name.
2. In sexual reproduction DNA copying can never be perfect. Give reason to justify this statement.
3. State one reason why ozone layer is considered useful in the upper part of the earth's atmosphere.
4. "The magnification produced by a spherical mirror is -3". List four information you obtain from this statement about the mirror/image.



5. List two advantages associated with water harvesting at the community level.
6. In terms of reduce and reuse what changes would you suggest in your family to make them environment friendly?
7. The atom of an element has 15 protons in its nucleus. Identify the element and predict the following.
- (i) Common valency of that element
  - (ii) Group and period in which that element belongs to in the periodic table.
8. An organic compound P with molecular formula  $C_2H_6O$  which is used as an ingredient for making cough syrups on treating with alkaline potassium permanganate gives another compound Q. Q on treating with sodium bicarbonate gives brisk effervescence due to the evolution of a gas which turns lime water milky. Identify P and Q. Write the chemical equations involved.
9. When we treat soap with hard water an insoluble precipitate like substance is formed. What do we call that substance and what is that chemically? Write the chemical equation.
10. Explain with an example for each, how the following provides evidences in favour of evolution in organisms:
- a. Homologous organs      (b) Analogous organs      (c) Fossils
11. How do the following properties change as we move down the group and also across the period? Justify your answer.
- (i) Atomic radius
  - (ii) Metallic character
12. Mendel, in one of his experiments with pea plants, crossed a variety having round seeds with one having wrinkled seeds. Write Mendel's observations giving reasons of F<sub>1</sub> and F<sub>2</sub> progeny of this cross. State any two contrasting characters, other than roundness of pea plants that Mendel used in his experiments.
13. What are chromosomes? Explain how in sexually reproducing organisms the number of chromosomes in the progeny is maintained.
14. List in tabular form, two distinguishing features between the acquired traits and the inherited traits with one example of each.
15. What is meant by contraception? Name its any two methods. How does the use of these methods have a direct effect on the health and prosperity of a family?



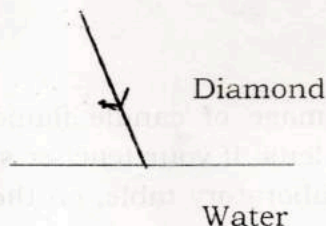
16. A pregnant lady, who is already a mother of one girl child, approached the doctor of an ultrasound clinic and requested him to determine the sex of the child in her womb. The doctor very politely refused the request explaining to her the legal and ethical point of view of the situation. Not only this, the doctor also, by his arguments and counseling, prepared the lady to happily face all the possible situations.

- Why is pre-natal sex determination ethically wrong?
- Had you been in place of the doctor, state the arguments you would have placed to counsel the pregnant lady?
- Why mother is not be considered responsible for giving birth to a female child?

17. Describe an activity to show that the colours of white light splitted by a glass prism can be recombined to get white light by another identical glass prism. Also draw ray diagram to show the combination of the spectrum of white light.

18. (a) State Snell's law.

(b) Given that the refractive index of diamond and water with respect to air are 2.42 and 1.33 respectively. Complete the diagram by showing refracted ray and mark angle of incidence and refraction.



19. A convex lens has a focal length 20cm. Find the position, nature and magnification of the image formed when the object is at 18cm from it. Also draw the ray diagram to show the image formation (not to scale)

20. Give reasons:

- Sky appears dark to passengers flying at very high altitudes.
- Danger signals are red in colour.
- Stars twinkle whereas planets do not twinkle.

21. A person sitting 5m away from a TV can see the TV programme clearly. But he cannot read the newspaper placed 25cm from his eyes clearly.



a. Name the defect of the eye.

b. Draw diagrams to show the image formation in the two cases.

c. How can he rectify the defect? Draw ray diagram to show this.

22.(a) An organic compound on treating with alkaline  $\text{KMnO}_4$ , the purple colour of  $\text{KMnO}_4$  got discharged. What does this indicate about the nature of the compound? What type of reaction will be given by this compound? Write the industrial application of this type of reaction with general equation.

(b) Micelle formation does not take place when soap is treated with alcohol.

Give reason.

(c) Write any two disadvantages of using detergents.

23.(a) Name the part of a bisexual flower that produces male and female germ cells.

(b) Draw a longitudinal section of the female reproductive part of a flower showing germination of pollen grain. Label on it the following:

(i) stigma, (ii) pollen tube with germ cells, (iii) female germ cells, (iv) style.

(c) Name the part of flower that develops into a (i) seed and (ii) fruit.

24. What is speciation? Name four factors that could lead to speciation. Which of these cannot be a major factor in the speciation of a self-pollinating plant species? Explain in brief.

## SECTION-B

25. Suppose you have focused on a screen the image of candle flame placed at the farthest end of the laboratory table using a convex lens. If your teacher suggests you to focus the parallel rays of the sun reaching your laboratory table, on the same screen, what you are expected to move, the:

(a) lens slightly towards the screen

(b) lens slightly away from the screen

(c) lens slightly towards the sun

(d) lens and screen both towards the sun

26. To determine the approximate value of focal length of a given concave mirror, you focus the image of a distant object formed by the mirror on a screen. The image obtained on the screen, as compared to the object is always

(a) laterally inverted and diminished



- (b) erect and diminished
- (c) inverted and diminished
- (d) erect and highly diminished

27. A student traces the path of a ray of light through a rectangular glass slab for the different values of angle of incidence. He observes all possible precautions at each step of the experiment. At the end of the experiment, on analysing the measurements, which of the following conclusions is he likely to draw?

- (a)  $i = e < r$
- (b)  $i < e < r$
- (c)  $i > e > r$
- (d)  $i = e > r$

28. A student traces the path of ray of light through a triangular glass prism for different values of angle of incidence. On analysing the ray diagrams, which one of the following conclusions is he likely to draw?

- a) the emergent ray is parallel to the incident ray
- b) the emergent ray bends at an angle to the direction of the incident ray
- c) the emergent ray and the refracted ray are at right angles to each other
- d) the emergent ray is perpendicular to the incident ray

29. Which is the byproduct formed during the preparation of soap

- (a) Glycerol (b) ester (c) glycol (d) glucose

30. During saponification reaction for the preparation of soap a small amount of sodium chloride is added to the reaction mixture for

- (a) The easy precipitation of soap
- (b) Evaporation of glycerol
- (c) Making the mixture warm
- (d) None of the above.

31. Water becomes hard due to the presence of

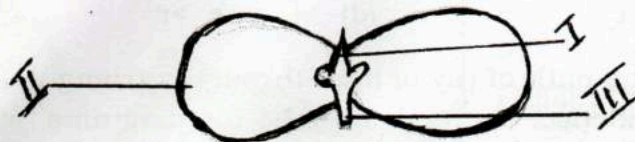
- (a) Calcium (b) aluminium (c) hydrogen (d) sodium



32. Which of the following is the set of homologous organs?

- a. Wings of pigeon and a butterfly
- b. Wings of a bat and a butterfly
- c. Wings of a bat and a pigeon
- d. Forelimbs of cow, a duck and a lizard

33. In the following diagram showing the structure of embryo of a dicot seed, what are the parts marked I, II and III sequentially.



- (a) Plumule, Cotyledon, Radicle
- (b) Plumule, Radicle, Cotyledon
- (c) Cotyledon, Plumule, Radicle
- (d) Radicle, Plumule, Cotyledon

34. An object is placed at a distance of 60cm from a convex mirror produces a magnification of  $\frac{1}{2}$ . Where should the object be placed to get a magnification of  $\frac{1}{3}$ ?

35. A child observed a permanent slide fixed under a microscope. He concluded that the slide shows binary fission in amoeba. Write any two observations he must have made to arrive at this conclusion.

36. Suppose you are provided with soap solution. How will you find out the nature of given sample of water?