IETWT1W

SCIENCE/विज्ञान
Class – IX/कक्षा – IX

Time allowed: 3 -3 ½ hours   Maximum Marks: 100

General Instructions:

(i)   The question paper comprises of **three Sections, A, B and C.** You are to attempt all the sections.

(ii)   **All** questions are **compulsory.**

(iii)   There is no choice in any of the questions.

(iv)   **All questions of Section-A,Section-B and Section-C** are to be attempted separately.

(v)   Question numbers **1 to 3** in **Section-A** are **one mark** questions. These are to be answered in **one word** or in **one sentence.**

(vi)   Question numbers **4 to 6** in **Section-A** are **two marks** questions. These are to be answered in about **30 words** each.

(vii)   Question numbers **7 to 18** in **Section-A** are **three marks** questions. These are to be answered in about **50 words** each.

(viii) Question numbers **19 to 24** in **Section-A** are **five marks** questions. These are to be answered in about **70 words** each.

(ix)   Question numbers **25 to 33** in **Section-B** are multiple choice questions based on practical skills. Each question is a **one mark** question. You are to select one most appropriate response out of the four provided to you.

(x)   Question numbers **34 to 36** in section B are **two marks** questions based on practical skills. These are to be answered in about **30 words** each.

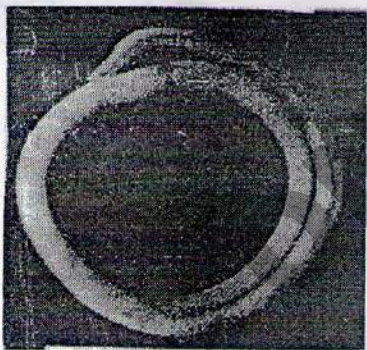(xi)   Question number 37 from **section C** is based on Open Text themes and is of **10 marks.**

भाग-अ / SECTION-A

1   Find the number of electrons, protons and neutron possessed by the alpha particles $\left({}_{2}^{4}\mathrm{He}^{1\ 1}\right)$ used in the gold leaf experiment.   1

2   Homo sapiens is the scientific name of human beings. What do these two terms imply ?   1

3   Give one example of biotic component of the biosphere.   1

4   What causes Japanese encephalitis ? How it can be prevented ?   2

5   Why tip of the pin is sharp but the head is broad ?   2

6   Define work. Write an expression for work in terms of force and displacement. State SI unit of work done.   2

7   Write the chemical formulae of Zinc chloride. Calculate its molecular mass. Also calculate the number   3
    of moles in 34 g of Zinc chloride. (Given atomic mass of Zn 65 u, Cl 35.5 u)

8   (a)   Both helium and beryllium have two electrons in the valence shells. Helium is a noble   3
          gas where as Beryllium is a metal, justify.

    (b)   Hydrogen exists in three isotopic forms. Why are the isotopes of hydrogen chemically
    a like ?

9   (a)   State the law of conservation of mass.   3

    (b)   In a chemical reaction 4.2g of sodium hydrogen carbonate reacted with 3.0g of
          ethanoic acid. The products obtained were 4.1g of sodium ethanoate, 0.9g of water and
          2.2g of carbon dioxide. Show that these observations are in agreement with the law of
          conservation of mass.

    (c)   State the postulate of Dalton's atomic theory which can explain the law of conservation
          of mass.

10 Carolus Liniaus gave the two kingdom classification. Later it was changed by Ernst Haikel   3
    (1894) and in 1959, Whittaker gave the five-kingdom classification.
    Do you think that studying about the work done by earlier scientists or their obsolete theories
    is useful for students of this generation? Give 3 reasons.

11 What are Phanerogams ? Name its two groups along with the criteria of division.   3

12 A hospital uses an ultrasonic scanner to locate tumours in a tissue. What is the   3
    wavelength of ultrasound in a tissue in which the speed of ultrasound is 1.5 km/sec.
    The operating frequency. of the scanner is 4.0 MHz. (1 MHz = 10^6 Hz)

13 (a) Name the physical quantity whose unit is hertz.   3
    (b) Define it.
    (c) Name the physical quality which is described by the   magnitude   of   the
    maximum disturbance in the medium on   either side of the mean value.

14 Define frequency and amplitude   3
    Draw diagrams to represent :
    (a)   Soft sound.
    (b)   Loud sound.

15 (a) The   sound   of   which   of   the   following   frequencies   is   andible   3
        to human ears.
        2 Hz,   5 Hz,   20 Hz,   200 Hz,   2000 Hz
    (b) How moths of certain families are able to escape capture?

16 (a) What is a stethoscope?   3
    (b) Which principle of sound is made use of by a stethoscope?

(c)   What is the function of eardrum?

17   (a)   Name the carbon containing molecule which is formed by green plants using carbon   3
dioxide.

(b)   Explain the two processes which add carbon dioxide in the atmosphere

18   Explain the biological processes in nitrogen cycle.   3

19   (a)   Write the rules followed for filling the electrons in various energy shells of any atom,   5
as proposed by Bohr and Bury.

(b),   Write the electronic configuration of an atom of Sulphur. Also draw a schematic
diagram of its atom showing the distribution of electrons in its shells.

20   State four differences between infectious and non-infectious diseases giving one example of   5
each.

21   (a)   Identify the organism shown in the picture and write the common name and scientific   5
name of the organism.

(b)   Name its phylum and kingdom.
(c)   Which organ of digestive system normally harbours this organism ?

22   (a) Define kinetic energy. Give its SI unit.   5

(b) Write an expression for kinetic energy of an object with mass x moving with speed y.

(c) How would the kinetic energy change if the mass of the object is doubled.

(d) How would the kinetic energy change if the velocity of the object is doubled.

23   Define density. Give its mathematical form.   5

Define relative density. Give its unit.

A solid weighs 80 g in air, 68 g in water and 60 g in oil. Calculate the relative density of oil
and solid.

24 (a) Explain why does water need conservation even though large oceans surround the   5
land masses ?

(b) Suggest any two ways for conservation of water and mention any three traditional
methods of doing so.

भाग–ब/SECTION - B

25 On an average sound waves travel in air at a speed of 340 m/s. From this statement it implies   1
that :

(a) the source of sound moves with a speed of 340 m/s.

(b) air does not move forward, but sound energy moves through it at a speed of 340 m/s.

(c) the air moves with a speed of 340 m/s.

(d) the observer moves with a speed of 340 m/s.

26 A gold biscuit of dimensions 4 cm x 6 cm x 0.1 cm is placed on a table. The density of gold is   1
$19600 kg/m^3$. The minimum pressure exerted by gold biscuit on the table is

(a) 196 Pa   (b) 11760 Pa

(c) 750 Pa   (d) 7580 Pa

27 (a) 86.0 m (b) 80.6 m (c) 0.086 m (d) 8.06 m   1

Find the wavelength of the tone produced by a body vibrating with a frequency 4 KHz. The
speed of sound in air is 344 m/s. The correct answer is :

(a) 86.0 m (b) 80.6 m (c) 0.086 m (d) 8.06 m

28 Needle – shaped structure in Pinus plant is :   1

(a) Leaf   (b) Shoot

(c) Stem   (d) Reproductive part

29 5.3 g acetic acid combines with 6 g sodium carbonate to form 2.2 g sodium ethanoate 0.9 g   1
carbon di-oxide and some water. If the law of conservation of mass in a chemical reaction is
true, then find the mass of water products.

(a)   8.20 g   (b)   8.02 g (c)   8.0 g   (d)   0.8 g

30 28g nitrogen combines with 6g hydrogen to form ammonia gas. If the law of conservation is   1

true, is the mass of ammonia gas ?

(a)   28 g   (b)   6 g   (c)   22 g   (d)   34 g

31   An example of a dicotyledonous plant is :   1

(a) Maize (b) Rose (c) Lily (d) Bamboo

32   Which of the following produce seeds without fruit :   1

(a) grapes (b) fern (c) paddy (d) cycas

33   Out of the following which one is an adapatation of mosquitoes ?   1

     (a)   Having gills for respiration.

     (b)   Having fins for movement.

     (c)   Having compound eye and antenna.

     (d)   Having lungs for respiration.

34   You are given a sphere of radius 2 cm. If you are asked to select a best suited spring balance to   2
determine its weight, then what should be the range and least count of the spring balance
(The sphere is made of an alloy of density $7310^3 \ kg \ m^{-3}$)

35   When an object is kept on a liquid, then two forces act on it. Name the two forces and their   2
directions.

36   Give an example of an organism which performs cutaneous respiration. Name the phylum   2
also to which it belongs.

भाग– स/Section – C

(* Please ensure that open text of the given theme is supplied with this question paper)

37   **Theme-I (Clean Air-A shared Concern): (5+5)**   10

     (a)   Much of our tangible heritage is at a danger of surviving for the coming generations.
Mention the reasons that why Tajmahal a white-marbled domed monument is turning
yellow ? Which steps are taken by Uttar Pradesh Government to prevent further
degradation of the marble of the monument.

     (b)   According to a US based study air pollution is the 5th largest killer in India. List the five
most critically polluted regions in the country according to this study. Mention the name
of those gases and their sources which add their releases into the air to make it polluted.