

Time : 3 Hrs.

M.M.: 90

**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 marks questions. These are to be answered in one word or in one sentence.
- (vi) Question numbers 4 and 5 in Section-A are two mark questions. These are to be answered in about 30 words each.
- (vii) Question numbers 6 to 16 in Section-A are three marks questions. These are to be answered in about 50 words each.
- (viii) Question numbers 17 to 21 in Section-A are five marks questions. These are to be answered in about 70 words each.
- (ix) Section-B has 3 OTBA questions. Question number 22 is two marks, Question number 23 is three marks and Question number 24 is five marks question.
- (x) Question numbers 25 to 33 in Section-C 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.
- (xi) Question numbers 34 to 36 in Section-C are two marks questions based on practical skills. These are to be answered in about 30 words each.

**SECTION-A**

- Q1. What will be the valency of an atom if it contains 11 protons and 12 neutrons? (1)
- Q2. Ramesh applies force on a heavy box placed in the store room of his house, but is unable to displace it. Has he done any work? Give reason. (1)
- Q3. What happens when lungs are targeted by microbes? (Write any two symptoms) (1)
- Q4. In a car lift, a car of mass 1200kg is resting on a platform of surface area  $10\text{m}^2$ . What pressure should the platform exert on the car so as to lift it? [Take  $g = 10\text{m/s}^2$ ] (2)
- Q5. Write one point of difference between the following: (2)
  - (a) Gymnosperm and angiosperm.
  - (b) Monera and Protista.

- Q6. (a) What are the various approaches to treat a disease? Explain. (3)  
 (b) Give one specific method of prevention of disease.
- Q7. Rajeev was playing cricket in the ground with his friends. One of his friend, who was standing near the boundary felt something climbing upon his feet. Subsequently, he started crying in pain. Rajeev being a science student identified the creature as a leech and helped removing it. (3)  
 (a) Name the phylum to which leech belongs.  
 (b) Write two identifying features of the phylum.
- Q8. (a) Write two ways by which HIV may get transmitted from one person to the other.  
 (b) Why does a person suffering from AIDS dies even due to small infection? (3)
- Q9. (a) Which of the following pairs are isotopes? Justify:  
 (i)  $^{209}_{84}\text{X}$  ,  $^{210}_{84}\text{X}$  (ii)  $^{232}_{90}\text{Z}$  ,  $^{231}_{91}\text{Z}$   
 (b) Give two important applications of isotopes. (3)
- Q10. (a) In Rutherford's alpha particle scattering experiment, write the conclusions derived from the following observations:  
 (i) Most of the alpha rays passed straight through the gold foil.  
 (ii) A very few alpha rays rebounded back.  
 (b) What is the electronic configuration of Mg atom? (3)
- Q11. (a) Calculate the number of moles in 51g of  $\text{Al}_2\text{O}_3$ . [Atomic masses: Al = 27u, O = 16u]  
 (b) Work out the formula of Calcium chloride. (3)
- Q12. The speed of a vehicle of mass 1000kg increases from 54 km/h to 72 km/h. Calculate the increase in its kinetic energy. (3)
- Q13. The volume of a solid of mass 500g is  $350\text{cm}^3$ .  
 (a) What will be the density of this solid?  
 (b) Will it float or sink in water?  
 (c) What will be the mass of water displaced by the solid?  
 [Given: density of water =  $1\text{g/cm}^3$ ] (3)
- Q14. In the office of Mohan's father, a tube of 40W, a fan of 75W and a cooler of 150W have been installed. If all these appliances are used for 10 hours a day, calculate the energy consumed per day in commercial unit of energy. (3)
- Q15. (a) Why do we prefer a suitcase with broad and thick handle?  
 (b) Why does an object float or sink when placed over the surface of water? (3)
- Q16. (a) Explain how defects in a metal block can be detected using ultrasound.  
 (b) Which part of human ear converts pressure variations into electrical signals? (3)

- Q17. The number of dengue cases had increased in Pooja's village in the last one year. She had studied that diseases like dengue spread through mosquitoes. She immediately talked to her friends and they all decided to kill the mosquitoes in the waterbodies in their locality. They also took help of the nearest municipal corporation office. (5)
- Write any two preventive measures that you would suggest for the prevention of such diseases spread by mosquitoes.
  - Which values are displayed by Pooja in taking the above initiative?
  - What are antibiotics? Why antibiotics do not work against viral infections?
- Q18. (a) Compare the classes amphibia, reptilia and pisces on the basis of: (5)
- structure of heart
  - organ of respiration
- (b) While printing, the scientific name of an organism should be written in italics. Write one other convention to be followed while giving scientific names of organisms and correct and rewrite the given scientific name - *Rana Tigrina*.
- (c) Give one characteristic feature of snail.
- Q19. (a) What is meant by atomicity? Write the atomicity of a molecule of sulphur and oxygen.
- (b) Calculate the molecular mass of  $\text{NH}_3$ .  
[Atomic masses: N = 14u, H = 1u]
- (c) Differentiate between cation and anion (any two points). (5)
- Q20. (a) State the law of conservation of energy.
- (b) Name the type of energy possessed by the following:
- stretched slinky.
  - a speeding car.
- (c) An object of mass 50kg is raised to a height of 600m above the ground. What is its potential energy? [Take  $g = 10\text{m/s}^2$ ] (5)
- Q21. (a) What is reverberation? How can it be reduced?
- (b) An echo is returned in 3s. What is the distance of the reflecting surface from the source, given that speed of sound is 342m/s? (5)

#### SECTION-B (OTBA)

**Theme : Clean India - We mean it!**

- Q22. Recent launch of 'Swachh Bharat Abhiyan' has inspired many of us to take up the task related to sanitation in and around us. What steps should be taken to reduce water pollution to make India clean? (2)
- Q23. Explain how sanitation can be linked to water resource management. (3)
- Q24. It is difficult to imagine a clean village until each citizen contributes. As a responsible citizen, what changes can you bring about in cultural and social norms to create a better environment to fulfill Gandhiji's dream of Swachh Bharat? (5)

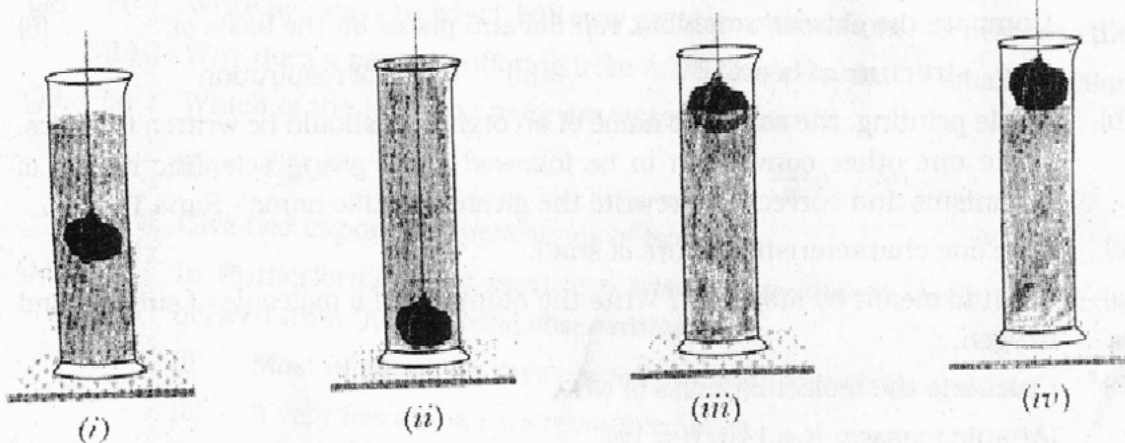


## SECTION-C

Q25. When a body is fully or partly immersed in a liquid, it undergoes an apparent loss in its weight due to: (1)

- (a) decrease in its mass (b) decrease in its volume  
(c) upward thrust exerted by the liquid (d) decrease in the density of the body

Q26. While measuring the volume displaced by a solid inside a liquid in a measuring jar, which of the following methods should be adopted? (1)



- (a) As in Fig. (i) the solid should be well inside the liquid.  
(b) As in Fig. (ii) the solid should be inside the liquid resting at the bottom of the jar.  
(c) As in Fig. (iii) the solid should be partially immersed in the liquid inside the jar.  
(d) Just rest at the surface of the liquid in the jar as in Fig. (iv).

Q27. To observe and compare the pressure exerted by a solid iron cuboid, two students performed the experiment with the cuboid of same dimensions and same weight. Student A placed the cuboid on sand while B placed it on a cemented floor.

The pressure exerted on the two surfaces observed by the students is: (1)

- (a) more on sand (b) more on cemented floor  
(c) equal on both surfaces (d) cannot be predicted

Q28. On a slinky, you can produce: (1)

- (a) a transverse wave but not a longitudinal wave  
(b) a longitudinal wave but not a transverse wave  
(c) a transverse wave as well as a longitudinal wave  
(d) neither a transverse wave nor a longitudinal wave

Q29. A sound wave strikes a wall perpendicularly. What is the angle of reflection of the sound wave? (1)

- (a)  $90^\circ$  (b)  $0^\circ$   
(c)  $45^\circ$  (d)  $30^\circ$

Q30. For studying the reflection of sound, the best reflector out of the following would be: (1)

- (a) a thermocole sheet (b) a cushioned sheet  
(c) a polished metallic sheet (d) a thick and rough curtain

Q31. The following are the stages in the life cycle of a mosquito:

- (i) Pupa (ii) Larva (iii) Egg (iv) Adult mosquito

The correct sequence is:

- (a) (i), (ii), (iii), (iv) (b) (ii), (i), (iii), (iv)  
(c) (i), (iii), (ii), (iv) (d) (iii), (ii), (i), (iv)

Q32. In the given figure, identify the parts marked as A and B. (1)

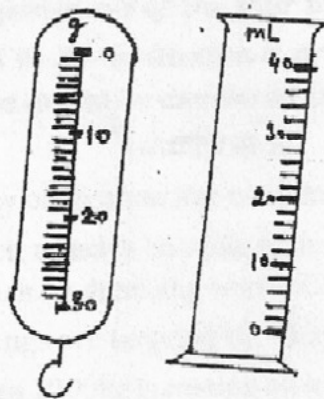
- (a) gills and pileus  
(b) pileus and gills  
(c) stipe and gills  
(d) annulus and stipe



Q33. The laboratory apparatus that is required to conduct the experiment to verify the law of conservation of mass in a chemical reaction is: (1)

- (a) conical flask, cork, ignition tube, thread  
(b) beaker, U-tube, thread, cork  
(c) round bottom flask, ignition tube, thread, petridish  
(d) beaker, ignition tube, thread, cork

Q34. What are the least counts of the spring balance and the measuring cylinder, respectively? (2)



Q35. Give the characteristic features of leaves and seeds of pea plant. (2)

Q36. In a process, 304g of ferrous sulphate decomposes on heating to give 160g of ferric oxide, 64g of sulphur dioxide gas and some amount of sulphur trioxide gas. What is the expected weight of sulphur trioxide gas? Which law of chemical combination is illustrated by the above reaction? (2)