

Roll No: 

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Total printed pages : 05
Total printed questions : 36

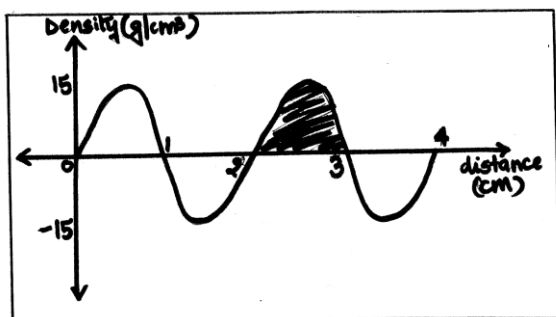
## General Instructions :

- i) This question paper comprises of three sections A and B. You are to attempt both the sections.
- ii) All questions are compulsory.
- iii) There is no overall choice.
- iv) **In Section A**
  - Question nos. 1 to 3 carry one mark each.
  - Question nos. 4 to 6 carry two marks each.
  - Question nos. 7 to 18 are three marks questions.
  - Question nos. 19 to 24 are five marks questions.
- v) **In Section B**
  - Question nos. 25 to 33 are multiple choice questions based practical skills, and carry one mark each. You are to select one most appropriate response out of the four provided to you. Write the answer in the answer sheet.
  - Question nos. 34 to 36 are two marks questions based on practical skills.

## SECTION - A

1. Define 1 W power. (1)
2. a) State the postulate of Dalton's atomic theory which supports the law of constant composition?  
b) Name the scientist who discovered the protons. (1)
3. Define an isotope and give one example. (1)
4. Name the following parts of the ear: (2)
  - a) The three bones that amplify the signals.
  - b) The part which converts the vibrations into electrical signals.
5. a) Write the chemical formulae of the following compounds:  
i) Zinc Nitrate                      ii) Magnesium Hydroxide  
b) Name the following compounds:  
i) KOH                                      ii)  $Al_2(SO_4)_3$  (2)
6. a) Write any two differences between acute and chronic diseases.  
b) Why we are advised to take bland and nourishing food when we are sick? (1+1)
7. Give reasons for the following: (1+1+1)
  - a) A truck has much wider tyres as compared to a car.
  - b) There is a decrease in weight of a solid when it is dipped inside a fluid.
  - c) An empty bottle bounces back to the surface when released under the surface of water.
8. Differentiate between positive and negative work. When you lift an object up, two forces act on it. Identify these forces. Which of these forces does  
a) positive work?                      b) negative work? (3)
9. A body of mass 5 kg is vertically thrown upwards with a speed of 10m/s. What is its kinetic energy? Find its potential energy at the highest point and also find the maximum height reached. (3)
10. Give reason for the following: (1+1+1)
  - a) Sound wave is a mechanical wave.
  - b) Roofs and walls of the halls are covered with wood.
  - c) Some animals get disturbed before an earthquake.
11. a) What is the full form of SONAR?  
b) A ship sends out ultrasound that returns from the seabed and is detected after 3.42s. If the speed of ultra sound through sea water is 1531m/s, what is the distance of the sea bed from the ship? (1+2)
12. a) Give any two conclusions of alpha ray scattering experiment.  
b) What was the drawback of Rutherford's atomic model?  
c) Draw a labelled diagram of Bohr's atom with three shells. (3)

13. a) Calculate the number of neutrons in  ${}_{12}\text{A}^{24}$ .  
 b) Write the electronic configuration of  ${}_{17}\text{B}^{35}$ .  
 c) What is the valency of  ${}_{7}\text{C}^{14}$ ?  
 d) What is the number of valence electrons in  ${}_{6}\text{D}^{12}$ ?  
 e) Name the valence shell in  ${}_{15}\text{E}^{31}$ ?  
 f) An element F has 6 valence electrons predict whether it is a metal or a non-metal. (3)
14. a) What are lichens?  
 b) Why do we keep snake and turtle in the same class? (any two reasons) (1,2)
- 15 Write any three differences between gymnosperms and angiosperms. (3)
16. a) We may catch common cold easily while sitting with a person but cannot catch diabetes even by hugging. Why?  
 b) Becoming exposed to or infected with an infectious microbe does not necessarily mean developing noticeable disease. Explain. (1,2)
17. Neha's friend Sudha was not keeping well for last few months. She was taken to hospital where the doctor diagnosed that she is suffering from blood cancer. On hearing this, Neha's mother told Neha not to visit her friend Sudha as she is afraid that Neha may also get infected with blood cancer.  
 i) Should Neha not visit Sudha?  
 ii) What justification Neha will give to her mother for visiting her friend Sudha?  
 iii) What are the chances of Sudha's recovery? (1+1+1)
18. i) Why female anopheles mosquito feeds on human blood?  
 ii) Differentiate between signs and symptoms of a disease. (Any two)  
 iii) Name two groups of microbes from which antibiotics could be extracted. (1+1+1)
19. a) Define gravitational potential energy.  
 b) Two bodies of same mass start from rest and move with velocities  $v$  and  $2v$  respectively. Find the ratio of their kinetic energies.  
 c) A body of mass 4Kg initially at rest is subjected to a force of 20N. Find the kinetic energy acquired by the body at the end of 10s. (1+2+2)
20. a) Differentiate between loudness and intensity.  
 b) Calculate the following using the given graph. Given that 20 waves are produced in 2s.



- i) Nature of the wave  
 ii) Time period  
 iii) Wave length  
 iv) Speed of the wave  
 v) Amplitude  
 vi) Significance of the shaded portion (2+3)
21. a) Calculate the percentage of oxygen in  $\text{H}_2\text{O}_2$ .  
 b) Calculate the number of moles in 56g of nitrogen gas.  
 c) Calculate the mass of 0.50 moles of Ca atoms.  
 d) Find the number of particles in  
 i) 5 moles of Methane gas  
 ii) 92 g of sodium (5)  
 [atomic masses: H=1, O=16, N=14, Ca=40, Na=23]
22. a) Give one word for the following:  
 i) The left half and right of the body have same designs.  
 ii) Metamerically segmented animals.  
 b) State reasons for each of the following:  
 i) Thallophyta, Bryophyta and Pteridophyta are called as 'cryptogams' while gymnosperms and angiosperms are 'phanerogams'. Discuss why?  
 ii) Forelimbs of birds are modified.  
 c) List any four common features in bat, cat and rat. (1,2,2)

## OTBA

## 2. Theme - Clean India - We mean it!

## Abstract

Recent launch of 'Swachh Bharat Abhiyan' has inspired many of us to take up the task related to sanitation in and around us. There are many case studies available which show the involvement of committed individuals and organizations who have done exceptionally good work in the area of sanitation. The content given here focuses on some selected case studies which help the learner to assimilate the importance of sanitation. It is also expected that the learner find solutions to day to day environmental issues based on the inputs given in the text.

## Sanitation - Need of the hour:

Let's start with the pledge we had taken on 2<sup>nd</sup> October 2014.

Pledge

*Mahatma Gandhi dreamt of an India which was not only free but also clean and developed.*

*Mahatma Gandhi secured freedom for Mother India.*

*Now it is our duty to serve Mother India by keeping the country neat and clean.*

*I take this pledge that I will remain committed towards cleanliness and devote time for this.*

*I will devote 100 hours per year that is two hours per week to voluntary work for cleanliness.*

*I will neither litter nor let others litter.*

*I will initiate the quest for cleanliness with myself my family, my locality, my village and my work place.*

*I believe that the countries of the world that appear clean are so because their citizens don't indulge in littering nor do they allow it to happen.*

*With this firm belief, I will propagate the message of Swachh Bharat Mission in villages and towns.*

*I will encourage 100 other persons to take this pledge which I am taking today.*

*I will endeavour to make them devote their 100 hours for cleanliness.*

*I am confident that every step I take towards cleanliness will help in making my country clean.*

There are individuals in our country who have been doing a lot of work in the area of sanitation. Read the three case studies and correlate that to what you have learnt in the unit : Our Environment

*Case Study-1: Waste to Wealth: An experiment in Schools*

*Fig. 1: Glimpses of Waste Management Activities*

Tirur Block in Malappuram district of Kerala has adopted an innovative approach to convert waste in the schools into wealth - through establishing a bio-gas plant in the school. Waste management is a major problem in the schools: given that 85 per cent of the things dumped as waste are actually resources in the wrong place, the necessity of correct practices for waste management is imperative.

To sensitise the younger generation of this fact, the Tirur block panchayat (BP) constructed a biogas plant (8 m<sup>3</sup> digester able to digest 75 kg bio-waste) in Government VHSS, BP Angadi, in Talakkad gram panchayat (GP). With around 2300 students on the rolls, the remains of the mid-day meal and the lunch brought by children is turned into bio-gas. A nearby hotel run by 'Kudumbashree' can also use this for its waste disposal. This in turn meets part of the fuel needs for cooking the mid-day meal. Slurry is used as manure for the school garden.

The waste from the school kitchen and food remains thrown away by the children used to make the surroundings dirty and a perfect breeding ground for diseases. The Tirur BP, formulated a plan for setting up a bio-gas plant for transforming this waste into a resource, that is, fuel for the mid-day meal and slurry/manure for the school garden. This unit is meant to be a display unit to show children how waste can be managed scientifically and turned into a useful resource.

Discussions were held with representatives of the school Parent Teacher Association (PTA), and their support ensured. Sustainability, a major factor in the case of such plants, operation and maintenance, was properly planned. Under the supervision of the PTA, health club/green club members formed maintenance committees which maintain and operate the plant without complaint. The plant has been operating successfully till date, with the help of the school authorities, especially with the help of some dedicated teachers. In case of schools situated in market places, vegetable, fish or chicken merchants use this facility to get rid of their waste and the schools get more fuel for their needs.

*Case Study-2: Dhedhuki- Water Resource Management*

Dhedhuki Regional Water Supply Scheme (RWSS) provides water to 22 villages of Sayla taluka in Surendranagar, Gujrat. Dhedhuki area is composed of sand stone, which is medium to coarse grained and has good porosity and transmissibility. However, the area around Dhedhuki has poor ground water quality and the average rainfall in the area is also on the lower side, about 500 mm. Under these circumstances, water resource management assumes significance for source sustainability.

Dhedhuki has two ponds namely, Somani talao and the Bhimnath talao which is on the road to Dhandhalpur. Both these ponds were deepened by excavating 55,000 m<sup>3</sup> and 6,000 m<sup>3</sup> mud respectively and the mud was used to increase the height of both the talaos by 30 cms. As result of deepening, the capacities of the two ponds have been augmented by 1,38,000 m<sup>3</sup>. In addition, a 3 km stretch of recharge channel has been deepened and diverted to the two ponds. Thus the water that overflows from the Bhimnath talao as well as the run-off from the village borders is diverted through the recharge channel. In each talao a recharge bore has also been developed so that water easily percolates into the aquifer. The Dhedhuki Regional Water Supply Scheme, sources the ground improving both the quantity and quality of water in the bore wells of the RWSS. The Pani Samiti of Dhedhuki participated in the work with complete enthusiasm.

Based on the report from operator of RWSS and village people of Dhedhuki, the inflow of water started in the ponds from mid night of July 01, 2007 and outflow started just after 8 hours from the time of inflow i.e. at about 0800 hrs on July 01, 2007 because it was indeed very heavy rains in the beginning itself. It was noticed that the result has been very encouraging and a huge quantity of pond water penetrated into deep aquifers through the bore wells.

*Case Study-3: Community Sanitary Complexes under Total Sanitation Campaign*



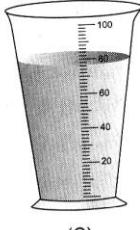


Fig. 4: A Community Sanitary Complex

A hilly state, Mizoram is situated in the Northeast corner of India. As per the 2001 Census, Mizoram has a population of 8,91,058 with a literacy percentage of 88.94 per cent. In Mizoram, the Total Sanitation Campaign (TSC) was introduced in 2002. Emphasis has been laid on information, education and communication components to change the behaviour of the targetted population, by creating awareness about health education. The programme is being implemented with focus on community-led and people-centred initiatives. The Village Water and Sanitation Committee (VWSC) plays an effective role in absorbing new ideas and concepts. Through the TSC, the consciousness of the community is being transformed towards health and hygiene practices. People choose from a has made a highly positive impact, especially in the rural areas.

A community sanitary complex (CSC) is an important component of the TSC. It is meant for public places, markets, etc, where large-scale congregation of people takes place. Mizoram has implemented innovative ideas for the operation and maintenance of such complexes, which is essential as gram panchayats (GPs) have to ultimately own the responsibility for them, as CSCs are to be used by the community. The location of a CSC is decided after taking into consideration where people congregate every day, that is, near shopping areas and taxi stands, etc. The public land is donated by the village council free of cost in the interest of cleanliness in the village.

An innovative design has been evolved for the CSC: one side of the complex is extended on one side, and this is converted into a shop, which could sell items of daily need, books, stationery or eatables. The shop is given to a person in return for a commitment to operate and maintain the CSC. The shop is rented generally for one year through local advertisements as per terms and conditions set for the purpose. The shopkeeper also takes care of the electricity and water bills of the CSC. In certain cases, where collection through users' fee has been large or the shop has been running successfully, the shop-owner also contributes up to Rs. 200 per month to the village council - for further maintenance of the complex or a one-time expenditure for the evacuation of the septic tank, as and when required. This has, therefore, resulted in the sustainability of the community sanitary complexes, constructed with central assistance under the Total Sanitation Campaign. Community members, too, are satisfied as they get clean sanitary facilities. This concept can certainly be replicated in the north-eastern reason for ensuring clean surroundings in public places and market areas.

23.
  - a) Write full name of TSC and CSC.
  - b) Suggest sanitation practices which may lead to reduction of air pollution and soil pollution from the inputs from the above case studies. (1,4)
24.
  - a) Why the school is using 'slurry' the waste product of biogas plant in his garden?
  - b) Give any two ways by which
    - i) CO<sub>2</sub> is fixed in the atmosphere and
    - ii) recycled back to the atmosphere.
  - c) What is TSC ? When it is introduced in Mizoram and what are its functions? (1,2,2)

25. While studying Archimedes principle, a student recorded following observations: (1)  
 Weight of the solid =  $w_1$   
 Apparent weight of the solid when fully immersed in tap water =  $w_2$   
 Weight of water displaced by the solid =  $w_3$   
 the student would observe that,  
 a)  $w_1 = w_3$       b)  $w_2 = w_3$       c)  $w_1 = w_2 + w_3$       d)  $w_2 = w_3 + w_1$
26. Using a spring balance, a given solid is weighed in the air. It is then weighed by immersing fully in water in each of the three vessels containing water as shown below. The apparent weight of the solid will be: (1)
- 


- (A)                      (B)                      (C)
- a) least in A      b) least in B      c) least in C      d) equal in all three cases.
27. While determining the density of a sphere a student noted down the following readings using a spring balance of least count 2g and measuring cylinder 2mL. Where did he make the mistake in taking the readings? (1)
- i) Mass of the sphere= 62g  
 ii) Reading of water level in the cylinder without sphere in it= 61mL  
 iii) Reading of water level in the cylinder with sphere in it= 70mL  
 a) step (i)      b) step (ii)      c) step (iii)      d) step (ii) and (iii)
28. To find the velocity of the pulse in a string we need: (1)
- a) only a measuring scale      b) only a stop watch  
 c) both (a) and (b)      d) none of these.
29. The angle between incident and reflected sound wave is  $130^\circ$ . The angle of incidence is: (1)
- a) data insufficient      b)  $65^\circ$       c)  $130^\circ$       d)  $25^\circ$
30. In an experiment for determining the velocity of propagation of a pulse in a slinky, we need a spring that is: (1)
- a) long, soft, and flexible      b) short, soft, and flexible  
 c) short, hard, and flexible      d) long, soft, but not flexible
31. Which of the following substances is capable of subliming? (1)
- a) Salt      b) Camphor      c) Sugar      d) Sand
32. Four students observed the specimens of two plants and sketched them as shown below. They noted in their notebook the identification and the names of the group to which these plants belong as given below. The correct identification is : (1)
- a) A – moss ; Bryophyta B – fern ; Pteridophyta  
 b) A – pine ; Gymnosperm B – leafy plant ; Angiosperm  
 c) Both A and B are moss and belong to Bryophyta  
 d) Both A and B are ferns and belong to Pteridophyta.
- 

- A                      B
33. Which of the following is correct observation about the seeds and flowers of gram plants? (1)
- a) Monocotyledonous seeds and timerous flowers  
 b) Monocotyledonous seeds and pentamerous flowers  
 c) Dicotyledonous seeds and trimerous flowers  
 d) Dicotyledonous seeds and pentamerous flowers
34. If 10g Barium Chloride is mixed with 15g of sodium sulphate, what will be the total mass of the products formed? Name the precipitate formed in the product. (2)
35. Give two points of how birds have adapted themselves to an aerial mode of life. (2)
36. Define Up thrust. List the factors on which up thrust acting over a body depend upon. (2)