



DELHI PUBLIC SCHOOL :: SURAT

SUBJECT : SCIENCE & TECHNOLOGY

Roll No :

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Class : IX

Marks : 80

Time Allowed : 3 Hrs

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 overall choice. However internal choice has been provided in all the three questions of five marks category. Only one option in such questions is to be attempted.*
- iv. All questions of section A and all question of section B are to be attempted separately.*
- v. Question numbers 1 to 4 in section A are one mark questions. These are to be attempted separately.*
- vi. Question numbers 5 to 13 are two mark questions, to be answered in about 30 words each.*
- vii. Question numbers 14 to 22 are three mark questions, to be answered in about 50 words each.*
- viii. Question numbers 23 to 25 are five mark questions, to be answered in about 70 words each.*
- ix. Question numbers 26 to 41 in section B are multiple choice questions based on practical skills. Each question is a one mark question. You are to choose out most appropriate response out of the four provided to you.*

SECTION A

1. How fast should a boy of 40kg run so that his kinetic energy is 500J? [1]
2. Define SI unit of work. [1]

3. Name the articles which act as 'nucleus' for water droplets to form around in the atmosphere. [1]
4. Name the bacteria that are responsible for the process of nitrification in nitrogen cycle. [1]
5. A weather forecasting plastic balloon of volume 15m^3 contains hydrogen of density $0.09\text{kg}/\text{m}^3$. The mass of the empty balloon is 7.15kg . Calculate (a) the mass of hydrogen in the balloon (b) the mass of the balloon filled with hydrogen. [2]
6. What is Archimedes' Principle? Give two applications of this principle. [2]
7. (a) A wave of wavelength 0.56 cm is produced in air and it travels at a speed of 320 m/s . Calculate the frequency of the wave.
(b) A boy shouts into a deep well and hears the echo at the end of 0.4s . If the speed of sound in air is 350 m/s , then find the depth of the water level in the well. [1+1]
8. Calculate the molar mass of:
(a) water (H_2O)
(b) nitric acid (HNO_3). [2]
9. Give reasons for the following:
i) Isotopes of an element are chemically similar.
ii) An atom is electrically neutral. [2]
10. What is ozone hole? How is it getting depleted? [2]
11. a) The heap of solid waste are a menace. Give two reasons.
b) Give a constructive way of dealing with plastic waste. [2]
12. What is a notochord? What does it give rise to? [2]
13. Who proposed the five kingdom system of classification? Name the five kingdoms? [2]
14. Define the SI unit of Power and derive a relation between power, force and velocity. [3]
15. (a) A boy standing between two cliffs claps and hears 2 echoes at the end of 1 s and 1.5 s respectively. If the velocity of sound in air is 350 m/s , then find the distance between the two cliffs. Also calculate the time taken for the third echo to be heard.
(b) The sonic boom of an aircraft has a time period of 0.00005s . Calculate the frequency of the sound produced. [2+1]
16. (a) Give one use of ultrasound in industry and one in hospitals.
(b) What is the name of the device which is used to find the depth of sea by using ultrasonic waves? [2+1]

17. Write the formulae and names of the compounds formed by the following:
- Potassium and iodide ions
 - Sodium and sulphide ions
 - Aluminium and phosphate ions. [3]
18. a) An element forms an oxide A_2O_5 .
- What is the valency of the element A?
 - What will be the formula of the chloride of the the element A?
- b) Which has more molecules and by how much?
- 10 g of Nitrogen (N_2)
 - 10 g of ammonia (NH_3) [3]
19. Differentiate between Amphibians and Reptiles regarding skin type, respiration and laying of eggs [3]
20. What do AIDS stand for? Prepare a list of modes of transmission of AIDS. [3]
21. What are the various means of spreading infectious disease? Give examples along with causative organisms. [3]
22. Describe the various ways by which infectious diseases can be prevented and cured. [3]
23. State the law of conservation of energy.
The following data was obtained for a body of mass 1kg dropped from a height of 5m:
- | Distance above the ground | Velocity |
|---------------------------|----------|
| 5m | 0m/s |
| 3.2m | 6m/s |
| 0m | 10m/s |
- Show by calculations that the above data verifies the law of conservation of energy (neglect air resistance). $g = 10m/s^2$. [5]

OR

- A man weighing 500N carried a load of 100N up a flight of stairs 4m high in 5seconds. What is his power?
 - A boy of weighing 40kg carries a box weighing 20kg to the top of a building 15m high in 25 seconds. What is his power? (Take $g = 10m/s^2$)
 - From (a) & (b) find who is more powerful, man or boy. Also find the ratio of their powers. [2+2+1]
24. In the gold foil experiment, what observations led Rutherford to conclude:
- Most of the space inside the atom is hollow
 - The central portion of the atom is positively charged
 - Volume occupied by the nucleus is very small as compared to the total volume of the atom
 - Almost the entire mass of the atom is concentrated at its centre [5]

OR

- a) Chlorine occurs in nature in two isotopic forms with masses 35u and 37u in the ratio 3: 1. Calculate the average atomic mass of chlorine atom on the basis of this data.
- b) Give uses of three isotopes. [5]
25. i) Why is Nitrogen important for all life forms?
ii) Explain the two ways by which it is changed into usable form.
iii) Draw the nitrogen cycle in nature showing the main processes involved in completion of this cycle. [5]

OR

- a) Carbon dioxide is necessary for plants. Why do we consider it as a pollutant?
b) Explain the role of the sun in the formation of soil.
c) Draw the carbon cycle in nature. [5]

SECTION B

26. When each side of a regular body is doubled, its volume becomes:
a. Two times
b. Four times
c. Eight times
d. Sixteen times [1]
27. If two liquids of same mass but densities ρ_1 and ρ_2 respectively are mixed, then the density of the mixture is:
a. $\rho = (\rho_1 + \rho_2) / 2$
b. $\rho = (\rho_1 + \rho_2) / 2 \rho_1 \rho_2$
c. $\rho = 2 \rho_1 \rho_2 / (\rho_1 + \rho_2)$
d. $\rho = \rho_1 \rho_2 / (\rho_1 + \rho_2)$ [1]
28. The density of salty solution of water as compared to density of pure water is:
a. More
b. Less
c. Same
d. Dependent on the concentration of the salty solution. [1]
29. On immersing a body fully in a liquid, the apparent loss in weight is :
a. More in a denser liquid
b. Independent of the density of the liquid
c. Less in a denser liquid
d. More in a lighter liquid [1]

30. The relative density of mercury is 13.6. Its density in SI unit is:
a. 13.6 kg/m^3
b. 136 kg/m^3
c. 1360 kg/m^3
d. $13.6 \times 10^3 \text{ kg/m}^3$ [1]
31. When a body is immersed (fully or partly) in a liquid, the apparent loss in its weight is due to:
a. Decrease in its mass
b. Decrease in its volume
c. An upward thrust exerted on the body by the liquid
d. Decrease in the density of the body [1]
32. When a wave travels in a medium, the quantity that is transferred from one place to the other with the wave is:
a. Mass
b. Velocity
c. Density
d. Energy [1]
33. The walls of a hall built for musical concert should:
a. Amplify sound
b. Reflect sound
c. Transmit sound
d. Absorb sound [1]
34. In a rope or a slinky:
a. Both transverse pulse as well as longitudinal pulse can be generated
b. Both types of pulse cannot be generated
c. Only a transverse pulse can be generated
d. Only a longitudinal pulse can be generated [1]
35. Which of the following statements is correct?
a. Both sound waves and light waves are transverse
b. Both sound waves and light waves are longitudinal
c. Sound waves are longitudinal and light waves are transverse
d. Sound waves are transverse and light waves are longitudinal [1]
36. Well defined nucleus is absent in:
a) Diatoms b) Amoeba c) Yeast d) Blue green algae [1]
37. The locomotory organ of Echinodermata are:
a) Tube feet b) Jointed legs c) Parapodia d) Setae [1]

38. Which among the following have open circulatory system? [1]
a) Arthropoda b) Annelida c) Mollusca d) Coelenterata
39. Which among the following produce seeds? [1]
a) Thallophyta b) Bryophyta c) Pteridophyta d) Gymnosperms
40. Two chambered heart is found in: [1]
a) Crocodiles b) Birds c) Fishes d) Amphibians
41. Fungi differ from algae in: [1]
a) Absence of chloroplast b) Presence of chitin in cell wall
c) Both a and b d) Thallus like body
