



INTSO EDUCATION

SCIENCE TALENT SEARCH OLYMPIAD (STSO) 2016-17

STAGE - 1

TIME : 60 min.

CLASS : IX

Max. Marks : 50

Instructions:

- ⇒ Fill the OMR sheet completely and carefully.
- ⇒ Each question carries one mark and has only one correct answer. No negative marks
- ⇒ The question paper contains 50 questions to be answered in 60 minutes.

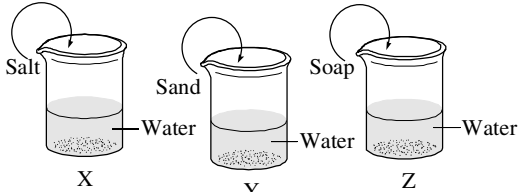
PHYSICS

1. A stone is released from an elevator going up with an acceleration 'a'. The acceleration of the stone after the release is []
1) a upward 2) (g - a) upward 3) (g - a) downward 4) g downward
2. The position vector of a particle is given by $\vec{r} = 2t\hat{i} - 5t^2\hat{j}$. What is the angle between initial velocity and initial acceleration ? []
1) zero 2) 180° 3) 90° 4) 45°
3. Two cars having masses m_1 and m_2 move in circles of radii r_1 and r_2 respectively. If they complete the circle in equal time, the ratio of their angular speeds $\frac{\omega_1}{\omega_2}$ is []
1) $\frac{m_1}{m_2}$ 2) 1 3) $\frac{r_1}{r_2}$ 4) $\frac{m_1 r_1}{m_2 r_2}$
4. When you speak to your friend. Which of the following parameter have a unique value in the sound produced []
1) Frequency 2) Wave length 3) Wave velocity 4) Amplitude
5. Ten coins each of mass 10gm are placed one above the other. The reaction force exerted by 7th coin from the bottom on the 8th coin is ($g = 10 \text{ m/s}^2$) []
1) 0.3 N 2) 0.2 N 3) 0.4 N 4) 0.7 N
6. A man of mass 60 kg uses a rope to climb which bears only 750 N. What is the maximum acceleration with which he can climb safely ($g = 10 \text{ m/s}^2$) []
1) 2.5 m/s^2 2) 15 m/s^2 3) 5 m/s^2 4) none of these
7. A mass M is lowered with the help of a string by a distance 'h' at a constant acceleration $\frac{g}{2}$. The work done by the string will be []
1) Mgh 2) $\frac{-Mgh}{2}$ 3) $\frac{3Mgh}{2}$ 4) $-\frac{3Mgh}{2}$
8. A hollow sphere of outer radius 9.0 cm and inner radius 8.0 cm floats almost half submerged in a liquid of density 800 kg/m^3 , what is the mass of the sphere ? []
1) 12.2 kg 2) 1.22 kg 3) 1.22 gm 4) 12.2 gm

9. A metal piece is trapped in an ice cube floating in water. If ice melts and metal sinks, the level of water will []
 1) increase 2) decrease 3) remains unchanged 4) cannot be predicted
10. Balls are dropped from the roof of a tower at a fixed interval of time. At the moment when 9th ball reaches the ground, nth ball is at $\frac{3}{4}$ th height of the tower. The value of 'n' is []
 1) 3 2) 7 3) 6 4) 5
11. A body is moved along a straight line by a machine delivering constant power. The distance moved by the body in time 't' propotional to []
 1) $t^{\frac{1}{2}}$ 2) $t^{\frac{3}{4}}$ 3) $t^{\frac{3}{2}}$ 4) t^2
12. The earth (mass = 10^{24} kg) revolves around the sun with an angular velocity 2×10^{-7} rad/s in a circular orbit of radius 1.5×10^8 km. Find the force exerted by the sun on the earth []
 1) 2×10^{21} N 2) 3×10^{21} N 3) 6×10^{21} N 4) None
13. If the atmospheric pressure is 76cm of mercury, at what depth of water the pressure will become 4 atmospheres []
 1) 31 m 2) 21 m 3) 11 m 4) 41.34 m
14. A nail driven into a wall by striking it with hammer is an example for []
 1) mass 2) impulse 3) acceleration 4) none of these
15. A car is travelling along a circular curve of a radius 50m. If its speed is 16 m/s and is increasing uniformly at 8 m/s^2 , the magnitude of its acceleration at this instant is []
 1) 8 m/s^2 2) 9.5 m/s^2 3) 9.8 m/s^2 4) 9.8 cm/s^2
16. Conservation of linear momentum is equivalent to []
 1) Newton's first law of motion 2) Newton's second law of motion
 3) Newton's third law of motion 4) Newton's law of gravitation
17. Which of the following is the evidence to show that there must be a force acting on earth and directed towards the sun ? []
 1) Deviation of falling bodies towards east 2) Revolution of the earth around the sun
 3) Apparent motion of the sun round the earth 4) Phenomenon of day and night

CHEMISTRY

18. During respiration, glucose and oxygen enter our body cells and waste products carbon dioxide and water leave the body cells by the process of []
 1) effusion 2) osmosis 3) diffusion 4) plasmolysis
19. Which of the following statements do not go with the liquid state []
 1) Particles are loosely packed in the liquid state
 2) Fluidity is the maximum in the liquid state
 3) Liquids cannot be compressed or less extent
 4) Liquids take up the shape of any container in which these are placed
20. Plasma state consists of _____ particles []
 1) super energetic 2) super excited particles
 3) ionised 4) all the above

21. Observe the above beakers which contains different types of solutions. Then choose the correct statement based on their properties. []
- i) the solution in beaker X cannot scatter the light
 ii) the particle size of solute in Z ranges between the particle size of X and Y
 iii) X and Z are stable, whereas Y is unstable
 iv) X is homogeneous but Y and Z are heterogeneous
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- 1) i, ii only 2) ii, iii only 3) iii, iv only 4) all
22. A few substances are arranged in the increasing order of 'forces of attraction' between their particles. Which one of the following represents the correct arrangement ? []
- 1) water, air, wind 2) air, sugar, oil
 3) oxygen, water, sugar 4) salt, juice, air
23. Water loving colloids are called as []
- 1) Hydrophilic 2) Hydrophobic 3) Lyophobic 4) Irreversible
24. The best method to separate the coloured components of an Ink is []
- 1) Chromatography 2) Evaporation 3) Sublimation 4) Filtration
25. Fractional distillation is used to separate []
- 1) Mixture 2 (or) more miscible liquids whose difference in their boiling points is less than 25K.
 2) Mixture of 2 (or) more immiscible liquids
 3) Mixture of solid and liquid components
 4) All of these
26. You are given a mixture of iodine in alcohol called tincture of iodine. Which method will you use to recover both, iodine as well as alcohol, from this mixture ? []
- 1) evaporation 2) simple distillation 3) filtration distillation 4) crystallisation
27. Two elements X and Y combine in gaseous state to form XY in the ratio 1 : 35.5 by mass. The mass of Y which combines with 2g of X will be []
- 1) 7.1 g 2) 3.55 g 3) 71 g 4) 35.5 g
28. Identify acetate radical from the following []
- 1) H^+ 2) $HCOO^-$ 3) CH_3COO^- 4) All
29. Which one of the following compound is not made up of charged ions []
- 1) NH_3 2) $NaCl$ 3) $MgCl_2$ 4) CaO
30. Which of the following is not the postulate of Dalton's atomic theory of matter []
- 1) Each element is made up of extremely small particles called atoms
 2) Atoms of a given element are identical in chemical properties but may have be different physical properties
 3) Atoms neither be created nor destroyed
 4) Compounds are formed by the chemical union of atoms of two or more elements in a fixed proportion which are simple whole number
31. Which of the following is not correct about cathode rays ? []
- 1) They are deflected towards the positive plate of the electric field.
 2) The nature of cathode rays does not depend on the nature of the material of the cathode.
 3) The nature of cathode rays depend on the nature of the gas taken in the discharge tube.
 4) Cathode rays are made up of electrons.
32. The atomic numbers of Neon (Ne), Magnesium (Mg), Aluminium (Al) and Phosphorus (P) are 10,12,13 and 15 respectively. Select the odd species in terms of electronic configuration []
- 1) Ne 2) Mg^{2+} 3) Al^{3+} 4) P^{3-}

33. The correct point regarding Thomson model is []
- 1) It is called plum pudding model or watermelon model
 - 2) In this model positive charge is spread through out the atom like the red part of watermelon and like black seeds electrons are distributed in it.
 - 3) Negative and positive charges are not balanced
 - 4) All

34. Elements from A to F have the distribution of electrons, protons and neutrons in the following way.

Element	Number of electrons	Number of protons	Number of neutrons
A	4	3	4
B	10	11	12
C	17	17	18
D	17	17	20
E	18	18	22
F	19	19	21

From the table, find the incorrect relation []

- 1) a pair of ions : A, B
- 2) an atom of noble gas : E
- 3) a pair of isobars : E, F
- 4) a pair of isotopes : D,E

BIOLOGY

35. Simple epithelium is a tissue in which cells are []
- 1) Hardened and provide support to organs
 - 2) Cemented directly to one another to form single layer
 - 3) Continuously dividing to form an organ
 - 4) Loosely connected to one another to form a irregular layer
36. While doing work and running, we can control our organs like hands and legs. In this reference which among the following is correct []
- 1) Smooth muscles contract and pull the ligament to move the bones
 - 2) Skeletal muscles contract and pull the ligament to move the bones
 - 3) Smooth muscles contract and pull the tendons to move the bones
 - 4) Skeletal muscles contract and pull the tendons to move the bones
37. If connective tissue like tendon develops into bone it is called []
- 1) Investing bone
 - 2) Replacing bone
 - 3) Sesamoid bone
 - 4) Dermal bone
38. Nerve cells lost their capacity of regeneration. Which among the following cell organelles are absent in neuron []
- 1) Mitochondria
 - 2) Ribosomes
 - 3) Nucleus
 - 4) Centrioles
39. **Blood cell** **Character of nucleus**
1. Acidophils (i) 'S' shaped
 2. Monocytes (ii) Biggest nucleus
 3. Neutrophils (iii) Bilobed
 4. Lymphocytes (iv) Kidney shaped
 5. Basophils (v) Multilobed
- Identify the correct combination of blood cell with its characters of nucleus []
- 1) 1 - iii, 2 - iv, 3 - v, 4 - ii, 5 - i
 - 2) 1 - i, 2 - ii, 3 - iii, 4 - iv, 5 - v
 - 3) 1 - v, 2 - iv, 3 - iii, 4 - ii, 5 - i
 - 4) 1 - iii, 2 - i, 3 - iv, 4 - v, 5 - ii

40. Which of the following prevents the rupturing of lysosomal membrane []
 1) Vitamin A 2) Cholesterol 3) Testosterone 4) UV - rays
41. Identify the cell organelle which contains maximum enzymes of the cell []
 1) Lysosomes 2) Nucleus
 3) Mitochondria 4) Endoplasmic reticulum
42. I am a cell organelle discovered by Palade and I can be considered as not a "true cell organelle".
 Guess who am I []
 1) Lysosome 2) Chloroplast 3) Mitochondria 4) Ribosome
43. Nucleus of a cell acts like a store house of genetic material which play a key role in heredity and
 morphology, this role was first demonstrated by X in Y.
 Identify X, Y []
 1) X - Fontana, Y - Orchid leaves 2) X - Robert brown, Y - Epithelial cells.
 3) X - Hammerling, Y - Acetabularia 4) X - Flemming, Y - Neurospora
44. Which of the following organisms are called prokaryotes []
 1) Algae 2) Bacteria 3) Virus 4) Fungi
45. Indicate the increasing order of the following cell organelles according to their size []
 1) Lysosome, Ribosome, Mitochondria, Chloroplast.
 2) Ribosome, Lysosome, Chloroplast, Mitochondria
 3) Ribosome, Lysosome, Mitochondria, Chloroplast
 4) Chloroplast, Mitochondria, Lysosome, Ribosome.
46. In plants, healing of wounds occurs due to []
 1) Lateral meristem 2) Primary meristem 3) Apical meristem 4) Intercalary meristem
47. The increase of plant body (Stem) in diameter, length respectively is due to the activity of []
 1) Lateral meristem, Intercalary meristem 2) Apical meristem, Lateral meristem
 3) Lateral meristem, Apical meristem 4) Intercalary meristem, Apical meristem
48. Raju is observing a cross section of stem and noticed a tissue composed of living, thin walled,
 polyhedral cell. What is the tissue observed by Raju []
 1) Collenchyma 2) Parenchyma 3) Sclerenchyma 4) Phloem
49. Identify the function of 'P' in the above given cell organelle []
 1) Contains enzymatic substances for respiration
 2) Providing protection to the given cell organelle
 3) Increase the surface area for cellular respiration
 4) All of these
50. Opening and closing of stoma is controlled by []
 1) Guard cells 2) Bulliform cells 3) Lenticels 4) Cortical cells

