INTSO EDUCATION

SCIENCE TALENT SEARCH OLYMPIAD (STSO) 2015-16

STAGE - 1

TIME : 60 min.

CLASS : VIII

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 force of 5N gives a mass m_1 an acceleration of 8 m / s^2 and a mass m_2 an acceleration of 24 m / s^2. the acceleration if both the masses are tied together is [ ]
   1) 0.6 m / s^2 2) 6 m / s^2 3) 0.06 m / s^2 4) 60 m /s^2

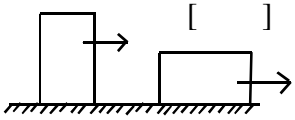
2. A 10 g bullet is shot from a 5 kg gun with a velocity of 400 ms^{-1}. The speed of recoil of the gun is
   1) 0.8 m /s 2) 8 m / s 3) 0.08 m / s 4) 80 m/s [ ]

3. A helicopter of mass M is rising vertically upwards with a uniform acceleration 'a'. If the collective mass of the people in the helicopter is m, what is the magnitude and direction of the force exerted by the people on the floor of the helicopter ? [ ]
   1) m (g + a) vertically down 2) m (g – a) vertically up
   3) m (g + a) vertically up 4) m (g – a) vertically down

4. A wooden block of mass 4 kg is floating on the surface of water. The buoyant force acting on the wooden block is (g = 10 m / s^2) [ ]
   1) 4 N 2) 40 N 3) 0.4 n 4) zero

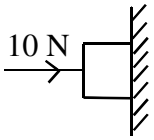
5. An ice - berg of density 900 kg / m^3 is floating in water of density 1000 kg / m^3. The percentage of volume of ice - berg outside the water is [ ]
   1) 20.5 % 2) 35 % 3) 10 % 4) 25 %

6. Two identical blocks are pulled along a rough surface as shown in the figure. Among the following the false statement is [ ]



   1) The coefficient of kinetic friction is the same in each case
   2) A force of the same magnitude is needed to keep each block moving
   3) A force of the same magnitude was required to start each block moving
   4) The magnitude of the force of kinetic friction is greater for the block on the right

7. A horizontal force of 10 N is necessary to just hold a block stationary against a wall. The coefficient of friction between the block and the wall is 0.2 .The weight of the block is



   1) 20 N 2) 50 N [ ]
   3) 100 N 4) 2N

8. A uniform chain of length L is placed on a rough horizontal table. The coefficient of friction between the chain and the table is ' μ '. The maximum length of the chain that can hang from the edge of the table is *l*, then [ ]

   1) $l = \frac{\mu L}{1+\mu}$ 2) $l = \frac{L}{1+\mu}$ 3) $l = \frac{1+\mu}{\mu L}$ 4) $l = \frac{1+\mu}{L}$

9. A light signal cannot escape from the surface of [ ]
1) neutron star 2) black hole 3) red giant 4) white dwarf

10. To an astronaut, the outer space appears [ ]
1) dark blue 2) white 3) black 4) dark red

11. Milky way is [ ]
1) a planet of our solar system 2) a sun
3) one of the solar systems 4) one of the solar galaxies of universe

12. Which of the following planets have rings around it ? [ ]
1) Uranus 2) Mars 3) Jupiter 4) Saturn

13. Five balls numbered 1 to 5 are suspended using separate threads. Pair (1, 2), (2, 4) & (4, 1) show electrostatic attraction, while (2, 3) and (4, 5) show repulsion. Then, ball 1 must be [ ]
1) Positively charged 2) negatively charged 3) neutral 4) made of metal

14. In an electric cell made by using Copper and Zinc rods kept in dilute sulphuric acid
1) at zinc rod $Zn + H_2SO_4 \rightarrow ZnSO_4 + 2H^+ + 2e^-$ [ ]
2) at copper rod $Cu + 2H^+ \rightarrow Cu^{+2} + H_2$
3) at Zinc rod $Zn + 2H^+ \rightarrow Zn^{+2} + 2e^-$
4) both 1 and 2

15. The electric field required to keep a water drop of mass 10g just to remain suspended, when charged with one electron is _____ N/C [ ]
1) 1.6×10^{-23} 2) 6.25×10^{17} 3) 1.6×10^{-22} 4) 10^{-1}

16. Which of the following countries in the world is most prone to earth quakes [ ]
1) China 2) Japan 3) India 4) Russia

17. Lightning conductor consists of [ ]
1) Long, thick metal rod or Strip 2) Blunt edge at its upper end
3) Sharp spikes at its upper end 4) Both 1 and 3

CHEMISTRY

18. The polymer nylon is formed from which of the following groups. [ ]
i) amine ii) ketone iii) adipic acid iv) aldehyde
1) All of these 2) only i and iii 3) only i, iii and iv 4) ii and iv

Passage :

Alcohol + organic acid $\longrightarrow A \xrightarrow{X} B$. 'B' is formed by the combination of a large number of molecules of A by the process 'X'.

Based on this, answer the following questions 19,20, 21 and 22.

19. Process X is called [ ]
1) Neutralisation 2) Combination 3) Polymerisation 4) All of these

20. Which of the following is correct regarding 'A' and 'B' [ ]
1) 'A' is the polymer of B 2) 'B' is the monomer of A
3) Both 'B' and 'A' are polymers 4) 'A' is the monomer of 'B'

21. 'A' is [ ]
1) Polyamide 2) Polyethylene 3) Polyester 4) Cellulose

22. 'B' on mixing with cotton gives a compound called [ ]
1) Terrycot 2) Polyester cotton 3) Polycot 4) All of these

23. Some properties were given as following

i) Soft and flexible ii) Remoulding is possible

iii) Heavily cross-linked polymers iv) Can be drawn into fibres.

v) Hard and rigid

Among these, the properties which are suitable for the substance used in making plastic chairs are [ ]

1) i, ii, iv only 2) iii and v only 3) i, iii and iv only 4) ii, iii, v only

24. Which of the following metal is cheap, more abundant and good conductor. [ ]

a) Iron b) Copper c) Silver d) Aluminium

25. $xFe + yO_2 \rightarrow Fe_xO_z$ is a balanced chemical equation. According to this equation, which of the following is correct [ ]

1) $x > y$ 2) $z - 1 = x$ 3) $x + y - \frac{1}{2} = z$ 4) All of these

26. [ ]

Column - I	**Column - II**
i) Phosphorous	p) Stored in water
ii) Sodium	q) Does not burn in air easily
iii) Carbon	r) Forms basic oxide on reaction with oxygen
iv) Copper	s) Can form two types of oxides

	i	**ii**	**iii**	**iv**
1)	s	p	q	r
3)	q	r	s	p

	i	**ii**	**iii**	**iv**
2)	p	r	s	q
4)	p	s	r	q

27. Namita categorised the different elements as shown below

	Characteristic	**Na**	**Cu**	**P**	**Fe**	**S**
p)	Metal	√	√	×	√	×
q)	Ductility	√	√	×	√	×
r)	Can form acidic oxide	×	×	√	×	√
s)	Malleability	√	×	√	×	√
t)	Non metal	×	×	√	×	√

Which of the following characteristic is correctly matched [ ]

1) p, r, t 2) q, s 3) p, q and t 4) All are correct

28. Read the following statements carefully.

P: I am the most common fire extinguisher but not suitable for oil, petrol and electrical fires. I am heavier than oil and also can conduct electricity.

Q: I am an excellent fire extinguisher and most suitable for oil, petrol and electrical fires. I also, form a blanket around the fire and bring down the temperature of the fuel. Identify the 'P' and 'Q'

	P	**Q**
1)	CO_2	H_2O
2)	H_2O	CO
3)	O_2	CO_2
4)	H_2O	CO_2

29. Sasi took 4 clothes P, Q, R and S of different materials of same size. She noted the weights of all the 4 clothes. She kept these 4 types of clothes in water separately for five minutes. She removed the clothes from water and spread the clothes on a pipe till water stops dropping from them. Again she weighed the clothes and noted in a tabular form.

Cloth	Initial weight in grams	Final weight in grams
P	30	40
Q	25	30
R	20	40
S	28	35

From the above data, we can say that which is a better material that can be used in summer.
1) P 2) Q 3) R 4) S [ ]

30. Which of the following reactions liberate a gas that is combustible but not supporter of combustion
1) Zn + HC*l* 2) $CaO + H_2O$ [ ]
3) Heating of $Pb(NO_3)_2$ 4) $NaHCO_3$ + HC*l*

31. Which of the following is an example of neutralisation reaction [ ]
1) $CaO_{(aq)} + CO_2$ 2) $KOH_{(aq)} + H_2SO_{4(aq)}$
3) $Al_2O_3 + NaOH_{(aq)}$ 4) All of these

32. Select the incorrect statement from the following [ ]
1) Stainless steel is an example of alloy
2) Iron is protected from rusting by galvanisation process.
3) Gold dissolves in conc. HC*l*
4) Zinc metal is more reactive than hydrogen

33. Which of the following is a mineral acid [ ]
1) Acid present in spinach 2) Acid present in lemon
3) Acid used in preservation of pickles 4) Acid used in batteries

34. Which of the following metal forms a protective layer of its oxide on exposed to moisture air
1) Iron 2) Zinc 3) Aluminium 4) Gold [ ]

BIOLOGY

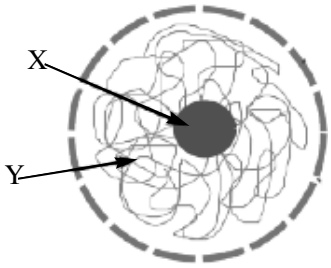
35. The sequential order for discovering things is [ ]
1) Experimentation - Analysis - Identifying a problem - Collecting information - Generalisation
2) Generalisation - Identifying problem - collecting information - Experiment - Analysis.
3) Identifying a problem - Hypothesis - Collecting - Information - Experiment - Analysis - Generalisation
4) Generalisation - Hypothesis - Collecting data - Experiment - Result analysis - Identifying a problem

36. Which of the following skills help to identify the different solutions for a problem [ ]
1) Hypothesis 2) Generalisation 3) Experimentation 4) Analysis

37. Siva is observing different varieties of seeds in his surroundings as a part of his project. What process skills he should have to get the information about the seeds. [ ]
1) Observation - comparison - classification 2) Classification - comparison - observation
3) Classification - observation - comparison 4) Comparison - classification - observation

38. Plant cells have more strength and rigidity this is due to the presence of [ ]
1) Cell membrane 2) Cytoskeleton 3) Cell wall 4) Cytoplasm.

39. Observe the following picture of nucleus [ ]

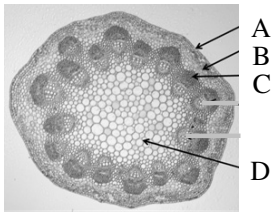


Identify the parts X and Y.
1) X - chromatin Y - nucleus
2) X - nucleolus Y - chromatin
3) X - chromosome Y -nucleoplasm
4) X - chromatin Y - nucleolus.

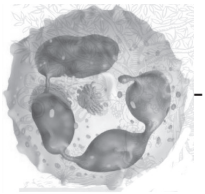
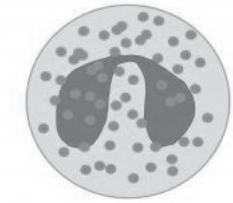
40. Observe the following picture of T.S of stem. [ ]

Which part of the stem help in conduction of food and water in the plant body.

1) A
2) B
3) C
4) D



41. Identify the mismatch. [ ]

1)  - Basophil
2)  - Monocyte
3)  - Eosinophil
4)  - Lymphocyte

42. Longest and largest cells respectively are [ ]
1) Ostrich egg & Bone cells
2) Nerve cell & Ostrich egg
3) Muscle cell & Nerve cell
4) Bone cell & Muscle cell

43. Jelly like substance present between the nucleus and cell membrane is [ ]
1) Protoplasm 2) Karyoplasm 3) Nucleoplasm 4) Cytoplasm

44. Match the following [ ]

	Column - I		**Column - II**
1)	Chicken Pox	A)	*Paramyxo Virus*
2)	Mumps	B)	*Plasmodium*
3)	Malaria	C)	*Myxovirus parotidis*
4)	Typhoid	D)	*Varicella virus*
		E)	*Salmonella typhi*

1) 1 - E, 2 - A, 3 - B, 4 - D
2) 1 - C, 2 - A, 3 - B, 4 - D
3) 1 - D, 2 - C, 3 - B, 4 - E
4) 1 - C, 2 - A, 3 - B, 4 - E

45. Rabies vaccine was discovered by [ ]
1) Dr. Y. Subba Rao
2) Alexander Flemming
3) Edward Jenner
4) Louis Pasteur

46. Biggest bacteria is [ ]
1) Thiomargarita namibiensis 2) Mycobacterium tuberculosis
3) Thermopilus aquaticus 4) Haemophilus influenza

47. Which of the following antibiotics is used to cure typhoid & plague [ ]
1) Erythromycin 2) Tetracycline 3) Penicillin 4) Xanthomycin

48. The process of conversion of sugars into alcohol is known as [ ]
1) Fermentation 2) Nitrification 3) Degradation 4) Glycolysis

49. Which of the following is incorrect [ ]
1) Bt cotton : Bacillus thuringiensis. 2) Food poisoning : Clostridium botulinum
3) Penicillin : Pencillium notatum 4) Nitrogen fixation : E. coli

50. During pasteurization milk is heated upto [ ]
1) 90ºC for 15 to 30 seconds 2) 80ºC for 20 to 30 seconds
3) 70ºC for 15 to 30 seconds 4) 60ºC for 20 to 30 seconds