



SANSKARAM

GROUP OF SCHOOLS

संस्कारम् के साथ, सफलता का विश्वास।।

CLASS: 9th

8th OLYMPIAD

Date: 29.12.2024

PAPER

Session : 2024-25

Time: 1:00 Hrs.

M.M.: 80

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

- Please fill up on the particulars given on the OMR sheet carefully no manual rechecking will be done.**
- Duration of Test is 1 hrs. This Question Paper Contains 80 Questions. All are compulsory. Each question carries one Mark. There is **NO NEGATIVE MARKING**.
- Answers are to be given on a separate OMR sheet.
- Use black and blue ball pen only to darken the circle.
- Mark your answers for questions 1-80 on the single OMR sheet by darkening the circles.
- Sequence of questions is **PHYSICS 1-20, CHEMISTRY 21-40, BIOLOGY 41-60, MATHEMATICS 61-80.**
- Rough work can be done anywhere in the booklet but not on the OMR sheet/loose paper.
- Please return the OMR sheet to the invigilator after the test.
- Do not fold OMR sheet and not make any stray marks on OMR sheet otherwise OMR sheet will not be evaluate at all.

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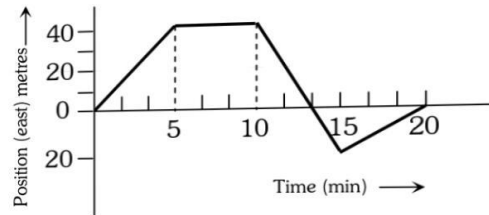
SANSKARAM 8TH OLYMPIAD

Q1. Two stones of equal masses are dropped from a rooftop of height h one after another. Their separation distance against time will

- a) Remain the same b) Increase c) Decrease d) Be zero

Q2. A boy begins to walk eastward along a street in front of his house and the graph of his position from home is shown in the following figure. His average speed for the whole time interval is equal to

- a) 8 m/min b) 6 m/min
c) 8/3 m/min d) 2 m/min



Q3. A car is moving with high velocity when it has a turn. A force acts on it outwardly because of

- a) Centripetal force b) Gravitational force c) Centrifugal force d) All the above

Q4. Which one of the following statements is not correct in uniform circular motion:

- a) The speed of the particle remains constant b) The acceleration always points towards the centre
c) The angular speed remains constant d) The velocity remains constant

Q5. A bomb of mass 9 kg initially at rest explodes into two pieces of masses 3 kg and 6 kg. If the kinetic energy of 3 kg mass is 216 J. then the velocity of 6 kg mass will be

- a) 4 m/s b) 2 ms⁻¹ c) 3 ms⁻¹ d) 6 m/s

Q6. Machine gun of mass 12 kg fires 25 g bullets at the rate of 4 bullets per second with a velocity of 500 m/s.

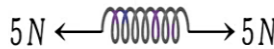
What force must be applied to the gun to hold it in position

- a) 20N b) 12.5N c) 50N d) 75N

Q7. A person is standing in an elevator. In which situation he finds his weight less than actual weight

- a) The elevator moves upward with constant acceleration
b) The elevator moves downward with constant acceleration
c) The elevator moves upward with uniform velocity
d) The elevator moves downward with uniform velocity

Q8. The tension in the spring is



- a) 0N b) 2.5N c) 5.0N d) 10N

Q9. A man starts walking from a point on the surface of earth (assumed smooth) and reaches diagonally opposite point. What is the work done by him

- a) Zero b) Negative c) Positive d) Nothing can be said

Q10. A light and a heavy body have equal momenta. Which one has greater K.E

- a) Lighter body b) Heavy body c) The K.E. are same d) Data incomplete

Q11. The Kinetic energy of the body is double the momentum will be

- a) Unchanged b) Become double c) Quadruple d) Increased by $\sqrt{2}$ times

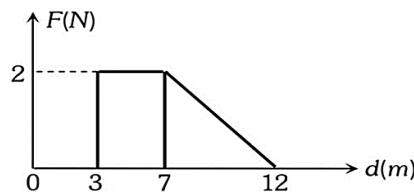
Q12. Power of a water pump is 2 kW. If $g = 10 \text{ m/sec}^2$, the amount of water it can raise in one minute to a height of 10m is

- a) 2000 litre b) 100 litre c) 1000 litre d) 1200 litre

Q13. A man does a given amount of work in 10 sec. Another man does the same amount of work in 20 sec. The ratio of the output power of first man to the second man is

- a) 1 b) $\frac{1}{2}$ c) 2/1 d) None of these

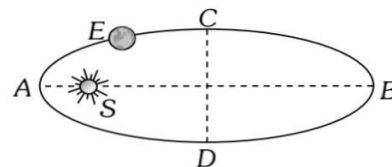
Q14. Force F on a particle moving in a straight line varies with distance d as shown in the figure. The work done on the particle during its displacement of 12 m



- a) 13J b) 18J c) 21J d) 26J

Q15. The earth E moves in an elliptical orbit with the sun S at one of the foci as shown in figure. Its speed of motion will be maximum at the point

- a) C b) A
c) B d) D



- Q16. The gravitational force F between two objects does not depend on
 a) Sum of the masses b) Product of the masses c) Gravitational constant d) Distance between the masses
- Q17. Two pieces of metal when immersed in a liquid have equal up thrust on them; then
 a) Both pieces must have equal weights. b) Both pieces must have equal densities
 c) Both pieces must have equal volumes d) Both are floating to the same depth

Q18. Velocity of sound in air

- I. Increases with temperature II. Decreases with temperature III. Increase with pressure
 IV. Is independent of pressure V. Is independent of temperature

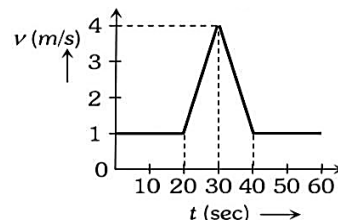
Choose the correct option:

- a) Only I and II are true b) Only I and III are true c) Only II and III are true d) Only I and IV are true

Q19. Velocity – time ($v-t$) graph for a moving object is shown in the figure.

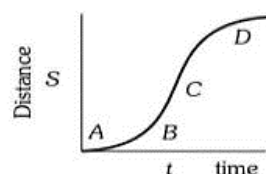
Total displacement of the object during the time interval when there is non-zero acceleration and retardation is

- a) 60 m b) 50 m
 c) 30 m d) 40 m



Q20. A particle shows distance – time curve as given in the figure. The maximum instantaneous velocity of the particle is around the point

- a) D b) A
 c) B d) C



Q21. Which one of the following is not a solution?

- a) HCl reagent b) Brass c) HCHO + water d) Kerosene + water

Q22. Boiling point of water is –

- a) 273K b) 0K c) 373K d) 100K

Q23. The process by which a mixture of sodium chloride and ammonium chloride can be separated, is called–

- a) Sublimation b) chromatography c) evaporation d) distillation

Q24. Which of the following statement is true?

- a) Colloidal solutions do not show Tyndal effect. b) Colloidal solutions show Brownian movement.
 c) Colloidal solutions are homogeneous d) Size of the colloidal particles is less than 1nm.

Q25. DHOKALA is a type of solution.

- a) Solid-in-solid b) Solid-in-gas c) Solid-in-liquid d) Gas-in-solid

Q26. China dish is

- a) Brittle and heat resistant b) Durable and heat resistant c) Brittle and corrosive d) Durable and non-corrosive

Q27. Compound A on strong heating in a boiling tube gives off reddish brown fumes and a yellow residue. When the aqueous solution of A is treated with a few drops of sodium hydroxide solution, a white precipitate appeared in the compound A. Identify the cation and anion present in the compound A.

- a) Copper (II) and nitrate b) Lead (II) and chloride c) Zinc and sulphate d) Lead (II) and nitrate

Q28. What will be the mass/mass percentage of a solution containing 30 gm of common salt in 220 gm of water?

- a) 3% b) 1.2% c) 12% d) 22%

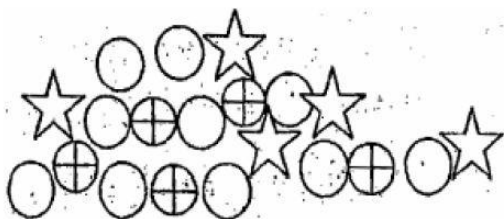
Q29. Cheese is an example of which type of colloid?

- a) Gel b) Foam c) Sol d) Solid sol

Q30. Which process is used to separate a mixture of two miscible liquids A and B having boiling points 56°C and 65°C respectively?

- a) Distillation b) Fractional distillation c) Sublimation d) Steam distillation.

Q31. While roaming in a parallel universe, you discover the hypothetical element 'X'. You obtain a representative sample of the element and discover that it is made up of three isotopes, X-48, X-52, X-54 to help your science team, calculate the atomic mass of the substance. You send the following drawing of your sample with you report.



In the report you also inform the science team that the circular; atoms are X-48, star atoms are X-52 and the remaining crossed circular atoms are X-54 what is the average atomic mass of X?

- a) 50.5 b) 51.5 c) 52.5 d) 53.5

Q32. How many sub-atomic particles are present in an α -particle used in Rutherford's scattering experiment?

| No. of protons | No. of Neutrons | No. of Electrons |
|----------------|-----------------|------------------|
| a) 4 | 0 | 0 |
| b) 2 | 0 | 2 |
| c) 2 | 2 | 0 |
| d) 2 | 2 | 1 |

Q33. A certain sample of element Z contains 60% of ${}_{69}\text{Z}$ and 40% of ${}_{71}\text{Z}$. What is the relative atomic mass of element Z in this sample?

- a) 69.2 b) 69.8 c) 70.0 d) 70.2

Q34. Consider following as a portion of the periodic table from Group No. 13 to 17. Which of the following statements are true about the elements shown in it?

- I) V, W, X and Z are less electropositive than X.
 II) V, W, X and Y are more electronegative than Z.
 III) Atomic size of Y is greater than that of W.
 IV) Atomic size of W is smaller than that of X.

| | | | | |
|---|--|--|---|---|
| | | | V | Z |
| W | | | | Y |
| | | | | |
| X | | | | |

- a) I, II and III b) II and III
 c) I and IV III and IV

Q35. Which rays are used to diagnose Intestinal cancer?

- a) Laser Rays b) Cathode Rays c) X-Rays d) γ - Rays

Q36. How many times weight of proton is greater than the mass of the electron?

- a) 1838 b) 1836 c) 1338 d) 1336

Q37. 'Proton' is:

- a) Nucleus of Deuterium b) Ionised hydrogen molecule c) Ionised hydrogen atom d) An alpha particle

Q38. Arrange of the following consist of one electron, one proton and zero neutron?

- a) ${}^1\text{H}_2$ b) ${}^1\text{H}_1$ c) ${}^1\text{H}_3$ d) 2He_4

Q39. The ascending order of $\frac{e}{m}$ (charge/mass) value for electron (e), proton (p), neutron (n) and alpha (α) particle is

- a) e, p, n, α b) n, p, e, α c) n, α , p, e d) n, p, α , e

Q40. Number of molecules in 14 g of carbon monoxide is

- a) 12.044×10^{23} b) 6.022×10^{23} c) 3.011×10^{23} d) 1.5050×10^{23}

Q41. Which of these is the smallest in size?

- a) Ribosome b) Lysosome c) Mitochondria d) Chloroplast

Q42. Which of the following organelles does not have membrane?

- a) Ribosome b) Nucleus c) Chloroplast d) Mitochondria

Q43. Thickness of plasma membrane (unit membrane) is –

- a) 75 Å b) 175 Å c) 125 Å d) 150 Å

Q44. The Golgi bodies are related to

- a) respiration b) excretion c) secretion d) circulation

Q45. The most abundant compound in cytoplasm is:

- a) fat b) water c) protein d) carbohydrates

Q46. Which of the following statements is not true?

- a) Both mitochondria and chloroplasts provide energy to cells in the same way.
 b) Both mitochondria and chloroplasts have more than one membrane.
 c) Only chloroplasts contain the pigment chlorophyll.
 d) Both animal and plant cells contain mitochondria.

Q47. Which of the following best describes the structure the plasma membrane?

- a) Phospholipids sandwiched between two layers of proteins b) Proteins embedded in two layers of phospholipid
 c) a layer of protein coating a layer of phospholipid d) phospholipids embedded in two layers of protein

Q48. Cyanobacteria have:

- a) a well – defined nucleus and chloroplast b) a well-defined nucleus but no chloroplast
 c) incipient nucleus and vesicles containing chlorophyll d) incipient nucleus but no chloroplast or pigment

Q49. Which of the following structures has 9 + 2 arrangement?

- a) Flagella b) Ribosome c) Mitochondria d) Golgi apparatus

Q71. Two parallel chords AB and CD in a circle are of lengths 8 cm and 12 cm, respectively and the distance between them is 6 cm. The chord EF, parallel to AB and CD and midway between them is of length \sqrt{k} , where k is equal to

- a) 100 b) 140 c) 144 d) 150

Q72. If $\frac{\sqrt{28-10\sqrt{3}} + \sqrt{7+4\sqrt{3}}}{\sqrt{16+6\sqrt{7}}} = a + b\sqrt{7}$, then what is the value of $(2a + b)$?

- a) 7 b) 14 c) $15\frac{1}{2}$ d) $17\frac{1}{2}$

Q73. If $ax^3 + bx + c$ is divisible by $x^2 + dx + 1$, then:

- a) $a^2 + b^2 = ac$ b) $a^2 - c^2 = ac$ c) $a^2 - b^2 = ac$ d) $a^2 + c^2 = ab$

Q74. $x^2 - 3x + 1 = 0$, then what is the value of $(x^5 + x^{-5})$?

- a) 119 b) 122 c) 123 d) 125

Q75. If $\sqrt{x^2\sqrt[3]{x^4y^2}} + \sqrt{y^2 + \sqrt[3]{x^2y^4}} = k$, then which of the following is true?

- a) $x^2 + y^2 = k^2$ b) $x^{3/2} + y^{3/2} = k^{3/2}$ c) $x^{2/3} + y^{2/3} = k^{2/3}$ d) $x^{1/3} + y^{1/3} = k^{1/3}$

Q76. According to the Euclid's Geometry: Greek's emphasized on

- a) Inductive reasoning b) Deductive reasoning c) Both a and b d) None of these

Q77. If a right circular cone with slant height l and a right circular cylinder have the same radius r, same total

surface area and heights h and h¹ respectively then $\sqrt{\frac{l-r}{l+r}} =$

- a) $\frac{h}{h^1}$ b) $\frac{2h}{h^1}$ c) $\frac{h}{2h^1}$ d) $\frac{2h^1}{h}$

Q78. A number N² has 15 factors. What could be the number of factors of N

- a) 6 b) 8 c) both a and b d) None of these

Q79. Numbers a, b, c and d have 16, 28, 30 and 27 factors respectively. Which of these could be a perfect cube

- a) a b) b c) c and d d) both (a) and (b)

Q80. In a group of goats and hens, the total number of legs is 12 more than twice the total number of heads. The number of goats is

- a) 8 b) 6 c) 2 d) None of these