

AIMPIAD 2023

REWARD TEST

Class 10th to 11th moving

Previous Year Question Paper AIMPIAD - 2022



AIMPIAD-2022



NSTRUCTED TO DO SO BY THE INVIGIL

PREVIOUS YEAR QUESTION PAPER COURSE : FOUNDATION

A Unit of VSA Education Pvt. Ltd.

FOR CLASS X TO XI MOVING STUDENTS

Dat	e:XX-XX-XXXX	Time :1 Hours 30 Mins	Max. Marks: 360	
		GENERAL INSTRUCTIONS :		
1.	The Test Booklet (Physics, → All questions are comp → Marking Scheme : Fou awarded for incorrect n → Question paper is divid Section I :- Physics (Ques Section II :- Chemistry (Question III :- Biology (Question Section IV :- Mathematics Section V :- IQ (Question	Chemistry, Biology, Mathematics, IQ) co ulsory. • (4) mark for each correct response. M esponse and zero mark if no bubble is ed into five sections – stion No. 1 to 15 with Max. Marks - 60) testion No. 16 to 30 with Max. Marks - 60 tion No. 31 to 50 with Max. Marks - 80) (Question No. 51 to 70 with Max. Marks No. 71 to 90 with Max. Marks - 80)	onsists of 90 questions. linus One (–1) mark will be s darkened. 50) s - 80)	
2.	Blank papers, clip boards, gadgets, in any form, is no	log tables, slide rule, calculators, mob t allowed.	ile or any other electronic	F BEING
3.	Write your Name and Roll	No. in the space provided in the botton	n of this booklet.	
4.	Before answering the pape answer sheet.	r, fill up the required details in the bla	nk space provided in the	SEALS W
5.	Do not forget to mention y answer sheet.	our roll number neatly and clearly in th	ne blank space provided in the	REAK THE
7.	No rough sheets will be pr blank space provided in th	ovided by the invigilators. All the roug e question paper.	h work is to be done in the	DO NOT BE
8.	In case of any dispute, the final.	answer filled in the OMR sheet availab	ble with the institute shall be	
Nam	ne :	Roll No		

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SECTION - 1 Straight Objective Type

This section contains 90 multiple choice questions. Each question has choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

1. A rocket is launched upward from the earth surface whose velocity-time graph shown in figure. Then maximum height attained by the rocket is 1000 v(ms R Λ 100 120 20 40 60 80 (A) 1 km (B) 10 km (C) 100 km (D) 60 km 2. Which of the following demonstrates the law of reflection? (A) (B) (C) (D) 50 Plane mirror Plane mirror Plane mirror Plane mirror 3. A bomb of mass 9 kg explodes into two pieces of 3 kg and 6 kg. The velocity of 3 kg piece is 16 m/s. The kinetic energy of 6 kg piece is (C) 192 J (D) 687 J (A) 768 J (B) 786 J Sphere A has a mass of 100 kg. It is 50 m away from sphere B, which has a mass of 25 kg. The force 4. between them is F. The distance between them is halved and the mass of sphere A stays the same. What does the mass of sphere B have to be in order for the force to stay the same? (A) 6.25 kg (B) 12.50 kg (C) 31.25 kg (D) 50.00 kg An incident ray of light is initially normal to the surface of a plane mirror. The mirror is rotated untill the angle 5. between the incident and reflected rays is 30°. The mirror has been rotated through an angle of (A) 7.5° (B) 15° (C) 30° (D) 45° 6. A lighted candle S stands in front of vertical plane mirror M₄M₂ as shown below Mirror M. M_2 • C Å ŝ В The image of S is not visible to (C) C (D) All A, B and C (A) A (B) B **Rough Space**



7. Suppose the acceleration due to gravity at the Earth's surface is 10 m/s² and at the surface of Mars it is 4.0 m/s². A 60 kg passenger goes from Earth to the Mars in a space ship moving with a constant velocity. Neglect all other objects in sky. Which part of figure best represents the weight (net gravitational force) of the passenger as a function of time ?



- A car starts from rest and moves along the x-axis with constant acceleration 6 m s⁻² for 10 seconds. If it then continues with constant velocity, what distance will the car cover in 12 seconds since it started from rest?
 (A) 180 m
 (B) 300 m
 (C) 320 m
 (D) 420 m
- **9.** A student has four types of string that he labels W, X, Y and Z. The diagram shows the maximum weight that each can support without breaking.



- **10.** In an amusement park a moving bumper car (car 1) collides with a bumper car at rest (car 2) and, after the collision, both cars move. If momentum is conserved, which statement is correct?
 - (A) The momentum of car 1 increases and the momentum of car 2 decreases.
 - (B) The momentum of car 1 decreases and the momentum of car 2 increases.
 - (C) The total momentum of both cars increases.
 - (D) The total momentum of both cars decreases.

Rough Space



11. A car moving at 160 km/h when passes the mark-A, driver applies brake and reduces its speed uniformly to 40 km/h at mark-C. The marks are spaced at equal distances along the road as shown below.



12. 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 12m is :



13. Two thin lenses of focal lengths f_1 and f_2 are in contact and coaxial. The power of the combination is:-

(A)
$$\frac{f_1 + f_2}{2}$$
 (B) $\frac{f_1 + f_2}{f_1 f_2}$ (C) $\sqrt{\frac{f_1}{f_2}}$ (D) $\sqrt{\frac{f_2}{f_1}}$

14. A ray of light travelling in a transparent medium of refractive index μ, falls on a surface separating the medium from air at an angle of incidence of 45°. For which of the following value of μ the ray can undergo total internal reflection ?

(A)
$$\mu = 1.25$$
 (B) $\mu = 1.33$ (C) $\mu = 1.40$ (D) $\mu = 1.50$

15. In the system shown in the figure, the acceleration of the 1 kg mass and the tension in the string connecting between A and B is :

16.	The process in which a hydrated salt loses its water of crystallisation to the air is called :(A) Vaporisation(B) Deliquescence(C) Efflorescence(D) Sublimation					
17.	Which of the following statements is INCORRECT ? (A) The conjugate base of $H_2PO_4^{-1}$ is HPO_4^{2-} . (B) The pH of 1 M HCl is 0. (C) H_3PO_3 is a tribasic acid. (D) The concentration of H ⁺ ions in pure water is 10 ⁻⁷ mol L ⁻¹ at 298 K.					
18.	Which c (A) NH ₃ (C) NH ₄	of the following has $< N_2O_5 < NO < N_2O_5 < NO < N_2O_4 < NH_2O_5$	as arrang N ₂ H < N ₂ O	ged in order of ind	easing oxidation numbers of nitrogen? (B) $NO_2^+ < NO_3^- < NO_2^- < N_3^-$ (D) $NO_2^- < NaN_3^- < NH_4^+ < N_2^-$ O	
19.	How many moles of O_2 will be liberated by one mole of CrO_5 in the following reaction? $CrO_5 + H_2SO_4 \rightarrow Cr_2(SO_4)_3 + H_2O + O_2$ (A) 4.5 (D) None of these					ng reaction? (D) None of these
20.	A 10 ⁻⁶ M HCl solution is diluted to 100 times. The pH of the diluted solution would be (A) between 6 to 7 (B) between 7 to 8 (C) equal to 7 (D) equal to 10					on would be (D) equal to 10
21.	For the following reaction $2Pb(NO_3)_{\underline{P}} \xrightarrow{\Delta} 2PbO_{\underline{\alpha}} + \underline{R}NO_2 + \underline{Z}O_2$					
	$\frac{P \times R}{Q + Z}$	is	(R) /		(C) 1	
22.	(A) S Ratio of	two unknown ga	(D) 4 Ises which	ch released on h	eating aqueous solution	of ferrous sulphate is :
	(A) 2 : 1		(B) 1 : 2	2	(C) 1 : 3	(D) 1 : 1
23.	Which of the following is neither Arrhenius acid nor Bronsted acid?					
	(a) NH ₃		(b) HSO ₄ ⁻		(c) HPO ₃ ^{2–}	(d) HPO ₄ ²⁻
	(A) Only	ya	(B) a &	С	(C) a & d	(D) b & d
24. In general, nitrates are thermally unstable; when heated, the compounds break down. In w following cases are the correct products given for the breakdown of the nitrate listed?				s break down. In which one of the trate listed?		
	(A)	KNO.		KNO. + NO.		
	(B)	$Pb(NO_2)_2$		$PbO + NO + O_2$		
	(C)	HNO ₂		NO ₂ + H ₂ O + O ₂	2	
	(D)	NH₄NO₃		$NH_{3}^{2} + N_{2}^{2}O$	2	
				Rough	Space	

25. Which of the following pairs of substances would produce a brown precipitate if their aqueous solutions were mixed?

(A) $CuSO_4$ & NaOH (B) F

(B) $Fe_2(SO_4)_3$ & KOH (C) AgNO₃ & Nal

(D) None of these

26. Equal-sized pieces of aluminium were placed in test tubes containing equal volumes of acid at different temperatures. From the statements below identify the actions that a student could take to increase the reaction rate in the test tubes.

31. Woody female cones, like the one shown below, and male cones grow on the same tree. In which division of seeded plants would they be found?

35. Which of the following option is correct regarding the diagram given below?

Sprinkler system of irrigation

(A) It is useful for sandy soil and even land.(C) It is useful for loamy soil and uneven land.

(B) It is useful for loamy soil and even land.(D) It is useful for sandy soil and uneven land

Rough Space

36. Identify the type of asexual reproduction in hydra from the given image.

Microorganisms

(A) Viruses(B) Fungi(C) Algae(D) Fungi

Method of reproduction

Binary fission Budding Conjugation Spore formation

Rough Space

39. Which of the following option represents the correct locations of ribosomes from the diagram of plant cell given below?

(D) Pepsin

- **42.** Which component of gastric juice inactivates salivary amylase ? (A) Mucus (B) Rennin (C) HCI
- **43.** Choose the odd pair out . (A) Areolar connective tissue – Collagen (C) Neuron – Melanin
- 44.Photosynthesis is a
(A) Physico-chemical process
(C) Chemical process(B) Physical process
(D) Catabolic process
- **45.** Among mammals, which one plays a significant role in the digestion of milk proteins? (A) Pepsin (B) Rennin (C) Trypsin (D) Amylase
- **46.** The term 'water-pollution' can be defined in several ways. Which of the following statements does not give the correct definition ?

(B) Epithelium – Keratin (D) Muscle fibre – Actin

- (A) The addition of undesirable substances in water bodies.
- (B) The removal of desirable substances from water bodies.
- (C) A change in pressure of the water bodies.
- (D) A change in temperature of the water bodies.
- 47. The diagram below shows the locations of the pituitary gland and the kidneys in the human body.

The pituitary gland can release a substance into the bloodstream that signals target cells in the kidneys to reabsorb more water. The released substance is an example of (A) An enzyme (B) A hormone (C) A neurotransmitter (D) A vitamin

Rough Space

- Parishram TRANSLATE YOUR EFFORTS INTO PERFORMANCE ITTJEE | AIPMT | BOARDS | KVPY | OLYMPIADS 48. Which process is taking place in this diagram?

(A) Inhalation; the diaphragm is contracting.(C) Inhalation; the chest cavity is reduced.

(B) Exhalation; the diaphragm is relaxing.(D) Exhalation; the rib cage is expanding.

49. Two arteries and two veins are labelled in the diagram. Which two are veins?

50.

51. ABCD is a rectangle of dimensions 6 cm × 8 cm. DE and BF are the perpendiculars drawn on the diagonal of the rectangle. What is the ratio of the area of shaded to that of unshaded region?

(D) data insufficient

52. If
$$\frac{\sqrt{7} + 2\sqrt{3}}{2\sqrt{7} - \sqrt{5}} = \frac{c + \sqrt{p} + \sqrt{q} + \sqrt{r}}{23}$$
 (p < q < r), where p, q, r are rational numbers, then q + r - p = (A) 361 (B) 302 (C) 418 (D) 426

- 53. If a and b are positive integers such that $\frac{1}{a} + \frac{1}{b} = \frac{1}{5}$ then total number of pair of (a,b) are? (A) 3 (B) 2 (C) 1 (D) 0
- **54.** If a cube of maximum possible volume is cut off from a solid sphere of diameter d, then the volume of the remaining (waste) material of the sphere would be equal to

(A)
$$\frac{d^3}{3} \left(\pi - \frac{d}{2} \right)$$
 (B) $\frac{d^3}{3} \left(\frac{\pi}{2} - \frac{1}{\sqrt{3}} \right)$ (C) $\frac{d^2}{4} \left(\sqrt{2} - \pi \right)$ (D) None of these

55. The minimum value of the polynomial $p(x) = 3x^2 - 5x + 2$ is

(A) 7 : 3

(A)
$$-\frac{1}{6}$$
 (B) $\frac{1}{6}$ (C) $\frac{1}{12}$ (D) $-\frac{1}{12}$

56. If BC : CD = 2 : 3, AE : EC = 3 : 4 and BC : AE = 2 : 3, then find the ratio of the area of 'ECD to the area of 'AEB.

57. If $\tan \theta + 4 \cot \theta = 4$, the value of $\tan^3 \theta + \cot^3 \theta$ is

(A)
$$8\frac{1}{8}$$
 (B) 16 (C) $7\frac{9}{8}$ (D) $27\frac{1}{27}$

58. One of the factor of $(a + 2b)^3 + (2a - c)^3 - (a + 2c)^3 + 3(a + 2b)(2a - c)(a + 2c)$ is (A) 2a + 2b - 3c (B) 2a - 2b + 3c (C) 2a + 2b + 3c (D) -2a - 2b - 3c

59.	The expression $\frac{1}{1.2} + \frac{1}{2.3} + \frac{1}{2.3}$	$\frac{1}{3.4}$ + + $\frac{1}{n(n+1)}$ for any natural number n is :
	(A) Always greater than 1 (C) Always equal to 1	(B) Always less than 1 (D) Not definite

- 60. In a family of husband, wife and a daughter, the sum of the husband's age, twice the wife's age and thrice the daughters age is 85; while the sum of twice the husband's age, 4 times the wife's age and 6 times the daughter's age is 170. It is also given that the sum of 5 time the husband's age, ten times the wife's age and 15 times the daughter's age equals 450. The number of possible solutions, in terms of the ages of the husband, wife and the daughter, to this problem is

 (A) 0
 (B) 1
 (C) 2
 (D) infinitely many
- **61.** Two circles, each of which passes through the centre of the other, intersect at M and N. A line from M intersects the circles at K and L, as shown in fig. If KL = 6. Compute the area of Δ KLN.

(D) None of these

63. ABCD is a parallelogram with area 48cm^2 . E, F, G and H are the midpoints of AB, BC, CD and AD respectively. P is a point on HG such that HP : PG = 5 : 3. Then ar (ΔPEF) is

64. In the adjoining figure, AB, BC, CD are equal chords of a circle. If $\angle BAC = x^\circ$, then the measure of $\angle AED$ is :

65. A square is inscribed in a circle with radius 'r'. What is the probability that a randomly selected point within the circle is not within the square?

(A) 30 cm²

- 66. If x, $y \in R$ and $x > y \implies x^2 > y^2$ then -(A) x > 0 (B) y > 0 (C) x < 0 (D) y < 0
- 67. If the system of equation 3x + 4y = 12 and (a+b)x + 2(a b)y = 5a 1 has infinitely many solutions then a & b satisfy the equation (A) a - 5b = 0 (B) 5a - b = 0 (C) a + 5b = 0 (D) 5a + b = 0
 - **8.** If ABC is an equilateral triangle and AD \perp BC, then AD² is equal to –
- **68.** If ABC is an equilateral triangle and AD \perp BC, then AD² is equal to –

(A)
$$\frac{3}{2}$$
 DC² (B) 2 DC² (C) 3 DC² (D) 4 DC²

69. PQ is a chord of a circle. The tangent XR at X on the circle cuts PQ produced at R. If XR = 12 cm, PQ = x cm, QR = x - 2 cm, then x in cm is :

(A) 2 (B) 4 (C) 7 (D) 9 *Rough Space*

70.

Directions : (Questions 1 & 2) Find the missing number(s) :

Directions : In this question two statements 1 and 2 are followed by two conclusions I and II. You have to take the given statements to be true even if they appear to be at variance with commonly known facts, and then decide which of the conclusions logically follow(s) from the given statements. For each questions, mark out an appropriate answer choice that you think is correct.

73.	Statements: 1. All dogs are reptiles. 2 Some cats are reptiles				
	Conclusions : I. Some dogs are cats. II. Some cats are not reptiles.				
	(A) Only conclusion I follows. (C) Both I and II follow.		(B) Only conclusion II fol (D) Neither I nor II follows	(B) Only conclusion II follows (D) Neither I nor II follows.	
74.	If your birth day 30th June, 2003 falls on Mond 2005?		Monday, on what day of the week d	oes your birth day fall in the year	
	(A) Sunday	(B) Tuesday	(C) Wednesday	(D) Thursday	
75.	Three positions	of the same dice are give	ven below. Observe the figures car	efully and tell which number will	

76. Two players X and O play a game of "doughts and crosses" on a 3 x 3 grid. The purpose of the game is for a player to get 3 symbols belonging to the player in a straight line (vertically, horizontally or diagonally). Each player marks one symbol on his or her turn.

After two moves (1 turn each), the grid looks as follows with X to play next.

Where should X put his symbol next so that he will always win this game finally regard less of how well O plays?

(A) Bottom row right corner

(B) Bottom row middle cell

(C) Middle row left most cell

(D) It is not possible to always ensure X wins if O plays carefully

77. Six persons A, B, C, D, E and F are standing in a circle. B is between F and C. A is between E and D, F is to the left of D. Who is between A and F?
(A) B
(B) C
(C) D
(D) E

Direction : Choosing a similar related pair as the given number pair on the basis of the relation between the numbers in each pair.

 78.
 DFHJ : LNPR : : _____: BDFH (A) SVXZ
 (B) TVXZ
 (C) UVXZ
 (D) VXZT

Directions : In this question, two words indicated by I and II have been left out. The correct word to come in place of I is given as one of the four alternatives against I and the correct word to come in place of II is given as one of the four alternatives against II.

79.	I : Inert : Active : II I. (A) Static II. (P) Gymnast	(B) Statics (Q) Dynamic	(C) Helium (R) Participation	(D)Air (S) Smart
	(A)AQ	(B) BP	(C) CR	(D) DS
		Rou	gh Space	

In this question, the numbers follow a series as per some rule, Find out the missing number which will come in place of ______ from amongst the four alternatives.

80.	1, 1, 8,, 27, 9, 64 (A) 4	(B) 6	(C) 9	(D) 16		
81.	In a certain code CLOTH in that code -	ES is written as EXHAUS	T and THRICE is written a	s STABLE. How is SHIRT written		
	(A) BLUSH	(B) STAUL	(C) THULE	(D) BLASH		
82.	In a row of boys, Suresh positions, Suresh becon (A) 19	is seventh from the left a nes twenty-second from t (B) 31	and Rohit is twelfth from th the left. How many boys a (C) 33	ne right. If they interchange their are there in a row? (D) Cannot be found		
83.	Rani told Sunita, "The gi friend's mother." How is (A) Cousin	rl I met yesterday at the h the girl related to Rani's f (B) Mother	otel was the youngest dau riend? (C) Grandmother	ughter of the brother in law of my (D) Granddaughter		
84.	A child is looking for his father. He went 90 metres in the east before turning to his right. He went 20 metres before turning to his right again to look for his father at his uncle's place 30 metres from this point. His father was not there. From there he went 100 metres to his north before meeting his father in a street. How far did the son meet his father from the starting point?					
85.	If - means \div , + means (A) 52 \div 4 + 5 x 8 - 2 = (C) 36 x 4 - 12 + 5 + 3 =	x, ÷ means –, x means [.] : 36 = 420	+, then which of the follov (B) 43 x 7 ÷ 5 + 4 – = 2 (D) 36 – 12 x 6 ÷ 3 + 4	ving equations is correct? 5 = 60		
86.	If ' green ' means ' red ', ' means ' green ', what is (A) Blue	red ' means ' yellow ', ' ye the colour of clear sky? (B) Red	llow' means 'blue', 'blue (C) Yellow	e' means ' orange ' and ' orange ' (D)Orange		
87.	 In a certain language (i) 'hupa chip fu pa' stand for the statement 'Ram is very intelligent' (ii) 'Chip hupa kupa tik' stands for 'Hari is very smart' (iii) 'Luk fu hupa' stands for 'boy is intelligent' and (iv) 'fu tik dop' stands for 'smart and intelligent'. Which of the following stands for 'Hari'? 					
		Rough				

88. In a clock, only 3, 6, 9, 12 sign is present. If the clock is showing 5 : 40 then what time is seen in the mirror in front of the clock. (D) 7 : 25

(C) 3

Rough Space

(D)4

- (A) 8 : 20 (B) 6 : 20 (C) 6 : 25
- 89. How many squares are there in the following figure?

(B) 2

(A) 1

Syllabus

Class VIII

Physics

- Electric current and it's effects.
- Force and Pressure
- Heat and Temperature
- Light
- Motion and Time
- Sound

Chemistry

- Acid, Bases and Salts
- Metals and non-Metals
- Physical and Chemical Changes
- Synthetic Fibre and Plastic
- Water
- Coal & Petroleum
- Combustion & Flame

Biology

- Cell Structure and Function
- Crop Production and management
- Micro Organisms : Friends and Foe
- Respiration in organisms
- Transportation in Animals and Plants
- Weather, climate and adaptation of animals to climate

Mathematics

- Power & exponents
- Square & Square Roots, Cub & Cube Roots
- Algebric expression & identity
- Factorisation
- Linear Equation in one variable
- Comparing Quantities
- Congruent Triangles & Quadrilaterals
- Area
- Surface Area & Volume
- Visualizing Solid Shapes

IQ

- Blood Relation
- Coding-Decoding
- Direction Sense
- Cubes and Dice
- Counting of figures
- Insert the Missing character
- Mathematical operation
- Mirror Image & Water Image
- Number Ranking
- Number Series
- Embedded Figure
- Non-Verbal Series
- Venn-Diagram

Class IX

Physics

- Motion
- Force and Law of Motion
- Gravitation
- Light
- Sound

Chemistry

- Matter around us
- Is matter Around us Pure
- Atoms and Molecules
- Structure of atom
- Metal and Non-Metal

Biology

- Fundamental unit of life : CELL
- Tissue
- Improvement in Food Resources
- Micro Organism : Friend and Foe
- Reproduction & Reaching the age of adolescence.
- Pollution of Air and Water

Mathematics

- Number System
- Polynomial & its factorisation
- Triangle
- Quadrilateral & Circle
- Co-ordinate Geometry
- Linear Equation in two variables
- Area
- Surface Area & Volume
- Linear Equation in one variable
- Comparing Quantities

IQ

- Blood Relation
- Coding-Decoding
- Direction Sense
- Cube and Dice
- Counting of figures
- Insert the Missing character
- Mathematical operation
- Ranking (Number & Letter)
- Number Series
- Embedded Figure
- Non-verbal Series
- Mirror & Water Image
- Venn-Diagram

Class X

Physics

- Electricity
- Magnetism

Chemistry

Biology

Nutrition

Excretion

Tissue

Respiration

Transportation

Why do we fall ill?

Mathematics

Number Theory

Real Number

Similar Triangle

Trigonometry

Blood Relation

Clock & Calendar

Coding and Decoding

Sitting Arrangement

Mirror & Water Image Counting Figure Analogy

Embedded Figure

Insert the Missing Character

Ranking (Number & Letter)

Venn-Diagram & Syllogism

Mathematical Operation

Cubes and Dice

Direction Sense

Puzzle

Polynomial

Circle

Area

IQ

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Force and Laws of Motion

Chemical Reaction & Equation

Work Power and Energy

Acid, Bases and Salts

Metal and Non-Metal

Atoms and Molecules

Atomic Structure

Carbon & Its Compounds

How do organisms reproduce

Diversity in living organisms

Pair of Linear Equation

Surface Area & Volume

Co-ordinate Geometry

Area of Parallelogram & Triangle

Chemical Bonding

Optics Motion