

**GIMs - Genesis Ignited Minds Scholarship Test
9th Moving 10th (ICSE)**

Time: 2 Hours 30 Minutes.

M.M.: 201

General Instructions for the Paper

- Answers have to be marked on the OMR sheet provided.
- Blank Papers, Cell phones & Calculators are not allowed inside the hall.
- Marking Scheme:-
 - Objective Section (Section A to E)
Each Objective question from Section A to E carries +2 marks
No Negative marking for wrong answers.
 - Subjective Section (Section A to D)
Each subjective question from section A to D carries 5 marks.
 - Section F - Mental Ability
Each question in Section F carries 3 marks



Genesis Branches

SCO -294, Sector-20, Panchkula
SCO -13, Sector-15, Panchkula
SCO - 17, VIP Road, Zirakpur (Near Nand Sweets)
Helpline No: 9041056405 & 7696016405

Section A [Physics]

1. Two liquids of densities 2ρ and ρ having their volumes in the ratio 3 : 2 are mixed together. Density of the mixture will be
(a) $\frac{2\rho}{3}$ (b) $\frac{\rho}{2}$ (c) $\frac{8\rho}{5}$ (d) $\frac{4\rho}{5}$
2. A body sliding on a smooth inclined plane requires 6 s to reach the bottom, starting from rest at the top. How much time does it take to cover one-ninth ($1/9$) the distance starting from rest at the top?
(a) $(1/54)$ s (b) 2 s (c) $(9/6)$ s (d) 4 s
3. A bullet of mass 0.04 kg moving with a speed of 90 m/sec enters a heavy wooden block and stopped after 3s. What is the average resistive force exerted by the block on the bullet?
(a) 1 N (b) 1.2 N (c) 2 N (d) 3 N
4. Twelve one-rupee coins are put on top of each other on a table, where mass of each coin is 20g. The reaction of the 7th coin (counted from bottom) on the 8th coin is [take, $g = 10 \text{ m/s}^2$]
(a) 2N (b) 1N (c) 3 N (d) 4N
5. Suppose the earth suddenly stops attracting objects placed near surface. A person standing on the surface of the earth will
(a) remain standing (b) fly up
(c) sink into earth (d) Either (b) or (c)
6. On going from one planet to other planet, the value of G (gravitational constant)
(a) increases (b) decreases (c) remains same (d) None of these
7. The height at which the weight of a body becomes $(1/16)$ th of its weight on the surface of the earth (radius R), is
(a) 5R (b) 15 R (c) 3 R (d) 4 R
8. If the mass of the sun is ten times smaller and gravitational constant G is ten times larger in magnitude. Then, for earth,
(a) walking on ground would become more easy
(b) acceleration due to gravity on the earth will not change
(c) raindrops will fall much slower
(d) airplanes will have to travel much faster
9. An ice cube floats on water in a beaker with $(9/10)$ th of its volume submerged under water. What fraction of its volume will be submerged, if the beaker of water is taken to the moon where the gravity is $(1/6)$ th that on the earth?
(a) $9/10$ (b) $27/50$ (c) $2/3$ (d) Zero
10. If two forces in the ratio 1 : 7 act on two pistons of areas in the ratio 3 : 2, then the pressure exerted by the forces is in ratio
(a) 2 : 21 (b) 3 : 14 (c) 6 : 7 (d) 4 : 21

Subjective Questions (5 mark Each)

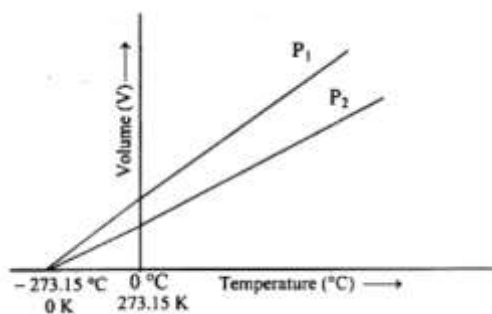
1.
 - (a) Draw a diagram to show the forces acting on a body floating in water with its some part submerged. Name the forces and show their points of application. How is the weight of water displaced by the floating body related to the weight of the body itself?
 - (b) A ball hits a wall horizontally at 6.0 m s^{-1} . It rebounds horizontally at 4.4 m s^{-1} . The ball is in contact with the wall for 0.040 s . What is the acceleration of the ball ? (2)
2.
 - (a) A block of mass 200 kg rests on a smooth horizontal surface. A block of mass 20 kg pushes the block with a force of 20 N .
Answer the following:
 - (i) How many forces act on the boy? Draw a labelled diagram to show all forces.
 - (ii) How many forces act on the block? Draw a labelled diagram to show all forces.
 - (iii) Will the boy move? Give a reason for your answer.
 - (iv) What will be the acceleration of the boy if the block takes the force exerted as the only horizontal force in the system.
3. Using the velocity-time graph, derive the three equations of uniformly accelerated motion. Also why do we choose a velocity time graph for these derivations why not displacement -time or acceleration time graphs
4.
 - (i) A boy gets into a floating boat.
 - (a) What happens to the boat ?
 - (b) What happens to the weight of water displaced ?
 - (c) What happens to the buoyant force on the boat ? (3)
 - (ii) Universal law of gravitation states that every object exerts a gravitational force of attraction on every other object. If this is true, why don't we notice such forces ? Why don't the two objects in a room move towards each other due to this force ? (2)

SECTION - B Chemistry

1. A sample of litmus paper turns red in gas X and blue in gas Y. On passing both gases separately through lime water, only X turns the solution milky. Which is likely true about X and Y?
 - (a) Both are oxides of non-metals, but only X is acidic.
 - (b) X is carbon dioxide, Y is ammonia.
 - (c) Only Y is acidic and reacts with lime water.
 - (d) X is hydrogen chloride, Y is oxygen.
2. Which arrangement shows only covalent bonding?
 - (a) MgCl_2 molecules in solid state
 - (b) HCl molecules in gaseous state
 - (c) CaO lattice
 - (d) NaOH in water

3. When a piece of zinc metal is dipped in copper sulphate solution, the solution turns colorless and reddish-brown copper is deposited. Which of the following best explains this reaction?
- Zinc displaces copper because it is less reactive.
 - Copper displaces zinc because it is more reactive.
 - Zinc displaces copper because it is more reactive.
 - No reaction occurs.

4. In a graph plotting gas volume (y-axis) against temperature in $^{\circ}\text{C}$ (x-axis), the line does not start at the origin but is extrapolated back to a temperature where volume becomes zero. What logical conclusion does this allow about the behaviour of gases?



Graph of volume against temperature

- Gases liquefy at 0°C
 - Gas volume always increases with temperature
 - There is a theoretical temperature (absolute zero) where molecular motion would stop
 - Gases never contract in volume
5. The metal carbonate which do not produce CO_2 on heating
- MgCO_3
 - CaCO_3
 - Na_2CO_3
 - Ag_2CO_3
6. Atoms A and B have configurations 2,8,1 and 2,8,7. If they form compound AB, what precise statement describes the resulting structure and its property?
- It has giant covalent bonding producing high hardness.
 - It forms a lattice of positive and negative ions producing brittleness and high melting point.
 - It forms a molecular compound with low melting point due to weak forces.
 - It exhibits metallic bonding leading to good conductivity.
7. When an iron nail is dipped in blue copper sulphate solution, the following observations are made over time: the solution slowly loses its blue colour, the nail surface becomes coated with a reddish-brown deposit, and eventually, the solution appears almost colorless. Which of the following best explains these changes?
- The iron nail reacts with copper sulphate, copper ions get reduced to copper metal while iron metal oxidizes to iron ions.
 - The copper ions are oxidized back into solution, and the reddish deposit is rust forming on the iron nail.
 - The iron precipitates as iron hydroxide on the nail, preventing further reaction, and copper stays dissolved.

- (d) The copper ions sublime into the surroundings while the iron nail remains unchanged.
8. Two identical balloons are filled at 10°C and 30°C, respectively, at the same pressure. What is correct about the ratio of their volumes?
 (a) The second balloon's volume is twice as large.
 (b) The second balloon's volume is greater, but less than double.
 (c) Both have equal volume.
 (d) The first is larger, since cold air expands
9. The correct chemical formula of potassium dichromate and valency of chromate ion is respectively:
 (a) KCr_2O_7 & -1 (b) $\text{K}_2\text{Cr}_2\text{O}_7$ & -1 (c) $\text{K}_2\text{Cr}_2\text{O}_7$ & -2 (d) $\text{K}_4\text{Cr}_2\text{O}_7$ & -2
10. Iron reacts with steam but not with cold water, forming a magnetic oxide and a gas. Which correctly identifies the oxide?
 (a) FeO (b) Fe_2O_3 (c) Fe_3O_4 (d) $\text{Fe}(\text{OH})_2$

Subjective Questions (5 marks Each)

1. (i) Deduce the molecular formula of the following salts:
 (a) Potassium permanganate
 (b) Ferric chloride
 (c) Sodium sulphate
 (ii) Calculate the molecular mass of the following compound
 $\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$ [Ca = 40, S = 32, O = 16, H = 1]
 (iii) Draw the electron dot structure of ethene. [3+1+1=5]
2. State which of the following chemicals will absorb moisture from the air (deliquesce), lose moisture (effloresce), or remain unchanged when exposed to the atmosphere.
 (a) Washing soda (b) Calcium chloride
 (c) Ferric chloride (d) Glucose (e) Potassium nitrate [1× 5 = 5]
3. (a) A diver carries an air tank filled to a pressure of 200 atm with a volume of 3 liters. As the diver descends underwater, the pressure increases to 5 atm due to water depth. If the temperature remains constant, what will be the volume of the air released from the tank when it reaches this pressure?
 (b) Two elements X and Y have atomic numbers 9 and 16 respectively.
 (i) Write the electronic configuration of both elements.
 (ii) Determine the number of valence electrons in each element.
 (iii) Based on their configurations, predict which element is more likely to form an ionic bond and justify your answer. [2+3=5]
4. (a) Lead nitrate is heated strongly, and it decomposes into three products. Identify the gases formed. How does temperature affect the rate of this reaction? Write the balanced chemical equation for the decomposition.

- (b) Metal A (atomic number 12) is placed in a solution of metal B sulphate, and a displacement reaction occurs with metal B (atomic number 29) being displaced. Write the electronic configurations of metal A & explain why metal A displaces metal B from the solution. Write the balanced chemical equation for the reaction if metal B is copper. [3+2=5]

SECTION - C [Biology]

1. Which of the following is the protective covering over the ovule?
(a) Placenta (b) Integument (c) Nucellus (d) Exine
2. Find the correct match:
I. Glucose - Simplest sugar
II. Fructose - Fruit sugar
III. Sucrose - Commercial sugar
IV. Lactose - Glucose + Fructose
(a) Only I and II are correct (b) Only II, III and IV are correct
(c) Only I, II and III are correct (d) All are correct
3. Mushrooms are an excellent source of vitamins and minerals. Which of the following is generally not found in mushrooms
(a) Niacin (b) Pantothenic acid (c) Tocopherol (d) Biotin
4. Spiny exoskeleton is a characteristic of
(a) Arthropoda (b) Cnidaria (c) Echinodermata (d) Mollusca
5. Body divisible in phyllid, rhizoids and caulid in:
(a) Pteridophyta (b) Thallophyta (c) Gymnosperm (d) Bryophyta
6. Number of chromosomes in parent plant are 32, what will be the number of chromosomes in endosperm of its seed
(a) 48 (b) 32 (c) 16 (d) 8
7. Which of the following structure of dicot and monocot seed is homologous
(a) Testa and Aleurone layer (b) Hypocotyl and Coleorhiza
(c) Cotyledon and Scutellum (d) Tegmen and Plumule
8. Pollination facilitated by winds is termed as
a) Entomophily b) Ornithophily c) Elephophily d) Anemophily
9. DNA of bacteria is
(a) Linear (b) Circular (c) Entangled (d) Helical

10. Match the column:

Column A	Column B
i. Leeuwenhoek	1. Observed cork slice
ii. Virchow	2. Free living cells in pond water
iii. Robert Hooke	3. Discovered nucleus
iv. Robert Brown	4. Expanded cell theory

(a) i-4, ii-2, iii-1, iv-3

(b) i-2, ii-4, iii-1, iv-3

(c) i-4, ii-2, iii-3, iv-1

(d) i-2, ii-4, iii-3, iv-1

Subjective questions

1. Observe the given image and answer the following questions: (2+3)

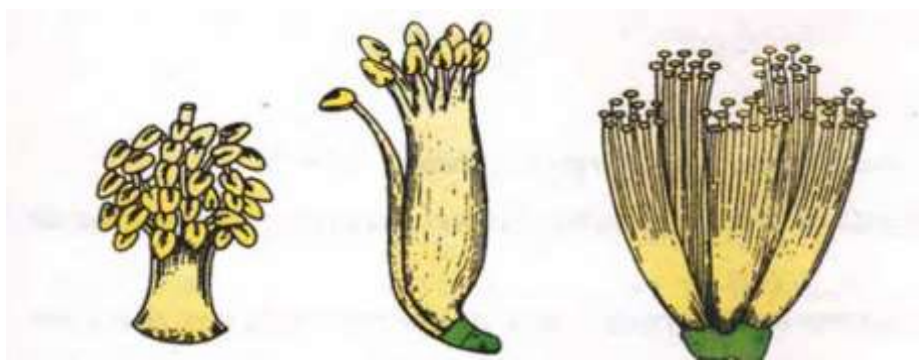


Fig. A

Fig. B

Fig. C

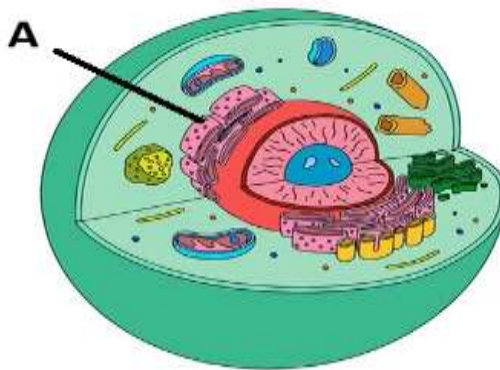
- Identify the part of flower shown in image write it's name and function
- Write the specific term for the type that each part A, B and C shows along with the reason for identification.

2. Name the type of tissues found in plants, write key differences between those tissues. (5)

3. Mention one similarity and one major difference in the following pairs of organisms: (1+1+1+1+1)

- Fern and Liverwort
- Cycas and Maize
- Spongilla and Hydra
- Earthworm and Ascaris
- Snail and Octopus

4. Observe the image and answer the following questions. (1+2+2)



- Identify the cell given and state the reason for identification.
- Identify the organelle given and state its function.
- Name the specific organelle only found in this cell and specific organelle absent in this cell.

SECTION - D Mathematics

- Upon factorizing, $x^2 + 6x - 27$ equals
(a) $(x+9)(x-3)$ (b) $(x-9)(x+3)$ (c) $(x-9)(x-3)$ (d) $(x+9)(x+3)$
- Aaron is flying a kite whose string makes an angle of 30° with the ground. The height of the kite above the ground after he has released 100 m of string is
(a) 50 m (b) 100 m (c) $50\sqrt{3}$ m (d) 200 m
- In a circle of radius 5 cm, AB and CD are two parallel chords of length 8 cm and 6 cm respectively. Then, the distance between the chords, if they are on the same side of the center
(a) 7 cm (b) 1 cm (c) 6 cm (d) None of these
- If $2^{x+y} = 128$ and $2^{x-y} = 8$, then the value of $x + y$ is
(a) 5 (b) 8 (c) 7 (d) None of these
- A triangular field PQR has sides $PQ = 50$ m, $PR = 70$ m, and $QR = 80$ m. Points S and T are the midpoints of sides PQ and PR respectively. A fence is to be built along line ST, and another along QR. If fencing costs ₹120 per meter along ST and ₹80 per meter along QR, then the ratio of the total fencing cost along ST to that along QR is
(a) 1:2 (b) 2:3 (c) 3:4 (d) 3:8
- $\frac{4 \cot^2 60^\circ + \sec^2 30^\circ - 2 \sin^2 45^\circ}{\sin^2 60^\circ + \cos^2 45^\circ}$ is equal to
(a) $\frac{5}{3}$ (b) $\frac{8}{3}$ (c) $\frac{2}{3}$ (d) $\frac{4}{3}$

7. A paint roller is a paint application tool(as shown) used for painting large flat surfaces rapidly and efficiently. Its length is 26cm long with an outer diameter of 7cm. Then, the maximum area of the surface that gets painted when the roller makes 6 complete rotations vertically, is

- (a) 1092 cm².
 (b) 1000 cm².
 (c) 1292 cm².
 (d) None of these



8. In what time will Rs. 1000 amount to Rs. 1331 at 10% per annum compound interest?
 (a) 2 yrs (b) 4 yrs (c) 3 yrs (d) None of these
9. The smallest rational number by which $\frac{1}{3}$ should be multiplied so that the product is a decimal expression that terminates after one place of decimal is
 (a) $\frac{1}{10}$ (b) $\frac{3}{10}$ (c) 3 (d) 30
10. Starting with a positive integer M written on the board, Sameer plays the following game: in each move, if x is the number on the board, he replaces it with $3x + 2$. Similarly, starting with a positive integer N written on the board, Harsh plays the following game: in each move, if x is the number on the board, he replaces it with $2x + 27$. Given that Sameer and Harsh reach the same number after playing 4 moves each, then the smallest value of M + N is
 (a) 5 (b) 10 (c) 15 (d) None of these

SUBJECTIVE (No Negative Marking)

1. Prove that:
 $2\log \frac{15}{18} - \log \frac{25}{162} + \log \frac{4}{9} = \log 2$
2. Abhi and Vidya each have a certain number of mangoes. Abhi says to Vidya, "if you give me 30 of your mangoes, I will have twice as many as left with you." Vidya replies, "if you give me 10, I will have thrice as many as left with you." How many mangoes does each have?
3. The teacher asked the students to correctly complete the following sentence about the rhombus. "A rhombus has a side length of l units and one of its angles is equal to θ . The ratio of the lengths of the two diagonals is dependent on?"
 Amayra: only l .
 Brinda: only θ .
 Cristie: both l and θ .
 Yukti: neither l nor θ .
 Who answered the question correctly? Show your work and give valid reasons.
4. In an equilateral triangle ABC, the side BC is trisected at D. Prove that $9AD^2 = 7AB^2$.

SECTION - E English

1. Phatik's relationship with his mother primarily reveals which aspect of his character?

a) His rebelliousness b) His craving for affection

c) His arrogance d) His self-sufficiency
2. The ending of *The Homecoming* is best described as –

a) Ironically tragic b) Sentimentally hopeful

c) Morally redemptive d) Spiritually enlightening
3. The personification of the train emphasizes –

a) The machine's lifelessness b) Its mechanical efficiency

c) Its human-like purpose and emotion d) Its superiority over humans
4. What is the poem ultimately celebrating?

a) Industrial progress b) Communication and connection

c) British punctuality d) Nature's beauty
5. The moral lesson of the story is best summarized as –

a) Rumors can ruin reputations b) Banks are unreliable

c) Gossip brings communities together d) Poverty leads to dishonesty
6. Identify the correct indirect speech:

"He said, 'I am tired of waiting.'"

a) He said that he is tired of waiting.

b) He said that he was tired of waiting.

c) He told that he was tired of waiting.

d) He said that he had been tired of waiting.
7. Choose the correct form:

"He is the ____ of the two."

a) taller b) more tall c) tallest d) most tall
8. The person who conducts sales at which goods are sold to people making the highest bid/offer is called

a) Conjuror b) Bursar c) Chairman d) Auctioneer
9. She teaches GK _____ English.

a) Across b) Beside c) Besides d) Along
10. Fill in the blank:

"No sooner had I reached the station ____ the train left."

a) when b) then c) than d) after

Section -F [Mental Ability]

1. The Colored Switches (Logical Deduction)
You have three identical, unlabeled boxes. One contains two Red marbles (RR), one contains two Blue marbles (BB), and one contains one of each (RB). All three boxes are labeled, but every single label is guaranteed to be incorrect. If you are only allowed to take out one marble from one box, how can you correctly label all three boxes? EXPLAIN
2. The Mysterious Mirror Clock
A watch shows 4:15. In a mirror, what time will it appear as?
3. The Light Race
You switch on a torch inside a moving train. To someone outside watching through the window, does the light move faster, slower, or the same?
4. The Number That Wanted to Vanish
You can write me in words, but if you remove one letter, I become even. What number am I?
5. The Family Photo Trick
In a photo, Ravi says, "I have as many sisters as brothers." His sister Rina says, "I have twice as many brothers as sisters." How many brothers and sisters are there?
6. The Numeric Code
You have a code where each letter corresponds to its position in the alphabet (A=1, B=2,... Z=26). The message "20 8 9 19 9 19 5 1 19 25" is given. Decode it.
7. The Letter Sequence (Number Pattern)
What is the next letter in the following logical sequence?
O, T, T, F, F, S, S, E, ?

Physics

1.C	2.B	3.B	4.B	5.B	6.C	7.C	8.B	9.A	10.A
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Chemistry

1.B	2.B	3.C	4.C	5.C	6.B	7.A	8.B	9.C	10.C
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Biology

1.B	2.C	3.C	4.C	5.D	6.A	7.C	8.D	9.B	10.B
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Maths

1.A	2.A	3.B	4.C	5.C	6.D	7.A	8.C	9.B	10.B
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English

1.B	2.A	3.C	4.B	5.A	6.B	7.A	8.D	9.C	10.C
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