Talent Search Exam. 2022

for class IX

TEST CODE **9000**

BOOKLET **B**

Duration : 1:30 Hours **Max. Marks : 240**

Please read the instructions carefully. You are alloted 5 minutes specifically for this purpose.

INSTRUCTIONS

A. General :

1. This booklet is your Question Paper. DO NOT break seal of Booklet until the invigilator instructs to do so. Total Questions to be Attempted 60: **Physics : 10, Chemistry : 10, Biology : 10, Mathematics : 20 & MAT : 10 Questions.**
2. The Answer Sheet is provided to you separately which is a machine readable Optical Response Sheet (ORS). You have to mark your answers in the ORS by darkening bubble, as per your answer choice, by using black & blue ball point pen.
3. Things NOT ALLOWED in EXAM HALL : Blank Paper, clipboard, log table, slide rule, calculator, camera, mobile and any electronic or electrical gadget. If you are carrying any of these then keep them at a place specified by invigilator at your own risk.
4. Do not use white-fluid or any other rubbing material on answer sheet. Before handing over the answer sheet to the invigilator, candidate should check that **Roll No, Test code and Book Code** have been filled and marked correctly. Immediately after the prescribed examination time is over, the **Answer sheet is to be returned to the invigilator.**

B. Filling the Answer Sheet :

5. On Side-1 of Answer Sheet write your Name and Roll Number in the respective boxes. Do not write anything on Side-2.
6. **Marking Scheme:**
   a. If darkened bubble is RIGHT answer : 4 Marks.
   b. If no bubble is darkened in any question: No Mark.
   c. If darkened bubble is WRONG answer: –1 Mark (Minus One Mark).
7. Think wisely before darkening bubble as there is negative marking for wrong answer.

PROCEDURE OF FILLING UP THE ANSWERS IN ANSWER SHEET

Avoid Improper Marking			Proper Marking
Partially Filled	Lightly Filled	Tick-Cross Marked	Fully darken

Name of the candidate (In Capital Letters)

Roll Number

I have read all the instruction and shall abide by them.

.....

(Signature of the candidate)

I have verified all the information filled in by the candidate.

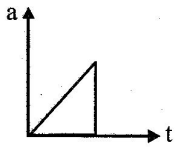
.....

(Signature of the Invigilator)

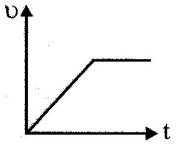
You can never quit. Winners never quit, and quitters never win.

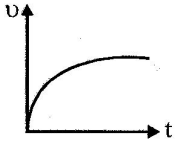
[PHYSICS]

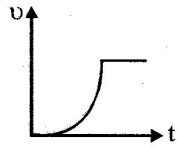
1. The acceleration-time graph of a body is shown below

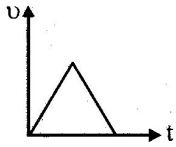


The most probable velocity-time graph of the body is

(a) 

(b) 

(c) 

(d) 

2. At an instant t, the co-ordinates of a particle are $x = at^2$, $y = bt^2$ and $z = 0$, then its magnitude of velocity at the instant t will be

(a) $t\sqrt{a^2+b^2}$ (b) $2t\sqrt{a^2+b^2}$

(c) $\sqrt{a^2+b^2}$ (d) $2t^2\sqrt{a^2+b^2}$

3. A body is thrown upward and reaches its maximum height. At that position –

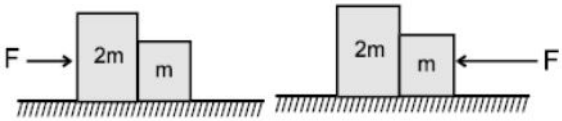
(a) Its velocity is zero and its acceleration is also zero

(b) Its velocity is zero but its acceleration is maximum

(c) It acceleration is minimum

(d) Its velocity is zero and its acceleration is the acceleration due to gravity

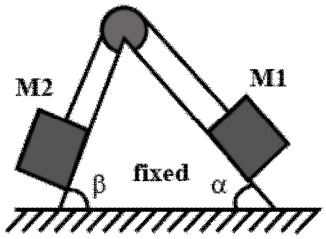
4. Two blocks are in contact on a frictionless table. One has mass m and other 2m. A force F is applied on 2m as shown in the figure. Now the same force F is applied from the right on m. In the two cases respectively, the ratio of contact force between the two blocks will be:



(a) Same (b) 1 : 2

(c) 2 : 1 (d) 1 : 3

5. Two masses M_1 and M_2 are attached to the ends of a light string which passes over a massless pulley attached to the top of a double inclined smooth plane of angles of inclination α and β. If $M_2 > M_1$ and $\beta > \alpha$ then the acceleration of block M_2 down the inclined will be:



(a) $\frac{M_2 g(\sin\beta)}{M_1+M_2}$

(b) $\frac{M_1 g(\sin\alpha)}{M_1+M_2}$

(c) $\left(\frac{M_2\sin\beta - M_1\sin\alpha}{M_1+M_2}\right)g$

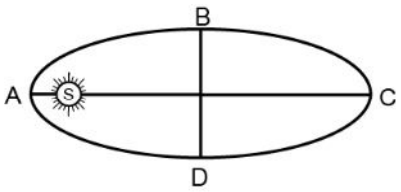
(d) Zero

6. The radius of a planet A is twice that of planet B. The average density of the material of planet A is thrice that of planet B. The ratio between the values of acceleration due to gravity on the surface of planet A and that on the surface of planet B is:

(a) $\frac{2}{3}$ (b) $\frac{3}{2}$

(c) $\frac{4}{3}$ (d) 6

7. The earth rotates about the sun (see figure) is an elliptical orbit. At which point its velocity will be maximum?



(a) At A (b) At B

(c) At C (d) At D

8. The height at which a body has one fourth of its weight when it is on the surface of the earth is –

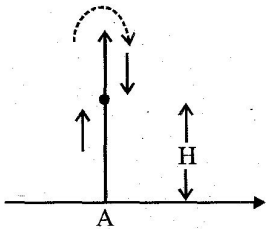
(a) At a height r where r is the radius of the earth

(b) At a height 2r where r is the radius of the earth

(c) At a height $\frac{r}{2}$ where r is the radius of the earth

(d) At a height $\frac{r}{4}$ where r is the radius of the earth

9. A ball is thrown vertically up from the point A (see figure). A person, standing at a height H on the roof of a building, tries to catch it. He misses the catch, the ball overshoots and simultaneously the person starts a stopwatch. The ball reaches its highest point and the manages to catch it upon its return. By this time, a time interval T has elapsed as recorded by the stop watch. If g is the acceleration due to gravity at this place, the speed with which the ball was thrown from point A will be



(a) $\sqrt{gH} + gT$ (b) $\left(\sqrt{g^2T^2 + 4gH}\right)/2$

(c) $\left(\sqrt{g^2T^2 + 8gH}\right)/2$ (d) $\left(\sqrt{g^2T^2 + 2gH}\right)$

10. A body of mass m collides against a wall normally with a velocity $\bar{V}$ and rebounds with the same speed. The change of momentum of the body is given by

(a) Zero (b) $m\bar{V}$

(c) $-2m\bar{V}$ (d) $-3m\bar{V}$

[CHEMISTRY]

11. A gas exerts a pressure of 3 kPa on the walls of container 1. When container one is emptied into 10 litre container, the pressure exerted by the gas increases to 6 kPa. Find volume of container 1. Assume that temperature and amount of gas remains same.

(a) 20 L (b) 25 L

(c) 30 L (d) 15 L

12. Which of the following statement is true about the solubility of a substance

(a) Solubility of solid in liquids increases on decreasing the temperature

(b) Solubility of solids in liquids increases on increasing the pressure

(c) Solubility of gases in liquids decreases on increasing the temperature

(d) Solubility of gases in liquids increases on decreasing the pressure

13. If the amount of heat needed for a phase change is 300 kcal, calculate the latent heat of a 5 kg material.

(a) 60 kcal/kg (b) 540 cal/kg

(c) 3.34×10^5 J/kg (d) 60 kcal/gm

14. Four substances were thoroughly mixed with water separately to obtain mixtures A, B, C and D. Some of their properties give below:

I. Path of a beam of light passing through it was visible in A, B and D but invisible in C.

II. On leaving undistributed, the particles of the substance settle down and particles are visible to naked eye in A but invisible in B, C and D.

Which of the following is correct about A, B, C and D?

(a) A, B and D are colloids. C is a solution

(b) A is a suspension. B and D are colloids. C is a solution

(c) A is a colloid. B, C and D are solutions

(d) A is a suspension B, C and D are colloids

15. Which of the following statements are correct about properties of colloids –

A. Colloid is a Homogeneous mixture

B. The size of particles of a colloid is too small to be individually seen by naked eye.

C. Colloids are big enough to scatter a beam of light passing through it & make its path visible

(a) A, B, C are correct (b) B and C are correct

(c) A and B are correct (d) A and C are correct

16. A solution is a homogeneous mixture of two or more substances. Which of the following is a solution:
(a) Milk (b) Smoke
(c) Brass (d) Face cream

17. Which of the following is correctly matched?

A.	Gel
B.	Coagulation
C.	Micelles
D.	Flocculation
(i)	Colloid-size clusters of molecules
(ii)	Reversible aggregation of colloidal particles
(iii)	A semi rigid mass of a lyophilic sol having a network
(iv)	Irreversible aggregation of colloidal particle

(a) A-ii, B-iv, C-i, D-iii
(b) A-iii, B-iv, C-i, D-ii
(c) A-i, B-ii, C-iii, D-iv
(d) A-ii, B-iii, C-iv, D-i

18. Match the following items Column-I with Column-II and choose the correct answer:

	Column-I		**Column-II**
1.	Magnesium	A.	Transition metal
2.	Francium	B.	Alkaline earth metal
3.	Copper	C.	Chalcogens
4.	Polonium	D.	Alkali metal

(a) 1-D, 2-B, 3-A, 4-C (b) 1-B, 2-D, 3-A, 4-C
(c) 1-B, 2-D, 3-C, 4-A (d) 1-D, 2-B, 3-A, 4-C

19. Valences of nitrite ion and nitrate ion are respectively
(a) 2, 2 (b) 1, 2
(b) 1, 1 (d) 2, 1

20. ^{35}Cl and ^{37}Cl are the two isotopes of chlorine, in the ratio 3 : 1 respectively. If the isotope ratio is reversed, the average atomic mass of chlorine will be –
(a) 35.0 u (b) 35.5 u
(c) 36.0 u (d) 36.5 u

[BIOLOGY]

21. The process of cell division by which most of the cells are divided for growth is called …….
(a) Reproduction (b) Meiosis
(c) Mitosis (d) None of these

22. Undefined nuclear region containing only nucleic acids is called ……..
(a) RNA (b) Genes
(c) Chromosome (d) Nucleoid

23. Water movement in plant shows osmosis results contraction and shrinkage of cell called ……..
(a) Reverse Osmosis (b) Endocytosis
(c) Transportation (d) Plasmolysis

24. In plants, ……. tissues conduct food and water from one part of the plant to other parts
(a) Transport (b) Circulatory
(c) Vascular (d) None of these

25. Differentiation leads to the development of various types of ……..
(a) Parenchyma tissue
(b) Meristematic tissue
(c) Permanent tissue
(d) None of these

26. Attachment of spindle fibres to kinetochores of chromosomes becomes evident in
(a) Anaphase (b) Telophase
(c) Prophase (d) Metaphase

27. Oesophagus, lining of mouth are covered with ……
(a) Simple epithelium
(b) Squamous epithelium
(c) Sponge epithelium
(d) All of the above

28. Heart can contract and relax by ……. movement
(a) Muscular (b) Fibres
(c) Both (a) and (b) (d) None of these

29. Match the List-I with List-II.

	List-I		**List-II**
A.	S-phase	1.	Proteins are synthesized
B.	G_2-phase	2.	Inactive phase
C.	Quiescent stage	3.	Interval between mitosis and initiation of DNA replication
D.	G_1-phase	4.	DNA replication

Choose the correct answer from the options given below.

(a) A-3, B-2, C-1, D-4 (b) A-4, B-2, C-3, D-1

(c) A-4, B-1, C-2, D-3 (d) A-2, B-4, C-3, D-1

30. The ciliated columnar epithelial cells in humans are known to occur in

(a) Bronchioles and Fallopian tubes

(b) Bile duct and Oesophagus

(c) Fallopian tubes and urethra

(d) Eustachian tube and stomach lining

[MATHEMATICS]

Section - A

31. The value of $\sqrt{97\times98\times99\times100+1}$ is equal to:

(a) 9901 (b) 9891

(c) 9801 (d) 9701

32. Which of the following are rational numbers?

(a) $\sqrt{2+\sqrt{3}}$ (b) $\sqrt{4+\sqrt{25}}$

(c) $\sqrt[3]{5+\sqrt{7}}$ (d) $\sqrt{6+\sqrt[3]{8}}$

33. If p(x) = x + 3, then p(x) + p(–x) is equal to

(a) 3 (b) 2x

(c) 0 (d) 6

34. A positive number whose reciprocal equal one less than the number, is:

(a) $\frac{\left(1+\sqrt{2}\right)}{2}$ (b) $\frac{\left(\sqrt{2}-1\right)}{4}$

(c) $\frac{\left(1+\sqrt{5}\right)}{2}$ (d) $\frac{\left(\sqrt{2}+\sqrt{5}\right)}{2}$

35. The factor of $\left(x^2+\frac{1}{x^2}-3\right)$ are –

(a) $\left(x+\frac{1}{x}-1\right)\left(x-\frac{1}{x}-1\right)$

(b) $\left(x-\frac{1}{x}-1\right)\left(x+\frac{1}{x}+1\right)$

(c) $\left(x-\frac{1}{x}+1\right)\left(x-\frac{1}{x}-1\right)$

(d) $\left(x+\frac{1}{x}-1\right)\left(x-\frac{1}{x}+1\right)$

36. If $x^2 - 5x + 1 = 0$ then the value of $x^5 + \frac{1}{x^5}$ is _____

(a) 2025 (b) 2725

(c) 2225 (d) 2525

37. $\frac{x^3+7x^2-x-7}{x^2+6x-7}=?$

(a) $\frac{(x-1)}{(x+1)}$ (b) $\frac{(x+1)}{(x+7)}$

(c) (x – 1) (d) (x + 1)

38. If a + b + c = 0, $a^2 + b^2 + c^2 = 10$, then the value of $a^4 + b^4 + c^4$ is

(a) 50 (b) 25

(c) 75 (d) 100

39. The incentre of the triangle formed by the points (–1, 0), (1, 0) and $\left(0,-\sqrt{3}\right)$ is :

(a) $\left(0,\frac{-1}{\sqrt{3}}\right)$ (b) $\left(\frac{-1}{\sqrt{3}},0\right)$

(c) $\left(0,\frac{1}{\sqrt{3}}\right)$ (d) None of these

40. The excentre of the triangle formed by the points (0, 3), (4, 0) and (0, 0) which is opposite to (0, 0) is:

(a) (4, 4) (b) (6, 6)

(c) (1, 1) (d) $\left(\frac{8}{9},\frac{8}{9}\right)$

41. If G is the centroid of Δ ABC, then $\frac{AG^2+BG^2+CG^2}{AB^2+BC^2+CA^2}$ =

(a) $\frac{1}{3}$ (b) $\frac{1}{2}$

(c) 1 (d) 2

42. Co-ordinates of a point on y-axis which is equidistant from the points (6, 5) and (–4, 3) are

(a) (9, 0) (b) (0, 9)

(c) (3, 2) (d) (0, 0)

43. The value of K for which the system of linear equations will have infinite solutions isL

(k – 1)x + ky = K +1; 2kx + (x + 6)y = 4k

(a) 3 (b) –3

(c) 2 (d) –2

44. Point of intersection of lines :

78x + 14y = 262; 14x + 78y = 198 is

(a) x = 3, y = 2 (b) x = 2, y = 3

(c) x = –2, y = 3 (d) x = –2, y = –3

45. Taxi fare in a city is as follows: for the first kilometer the fare is Rs 8.00 and for the subsequent distance it is Rs 5.00 per km. Taking the total fare for covering a distance of 'x' km as Rs 'y' which of the following is the equation that connects 'x' and 'y'

(a) $5x + y + 3 = 0$ (b) $5x - y + 3 = 0$

(c) $5x + y - 3 = 0$ (d) $5x - y - 3 = 0$

46. By selling 12 organges for a rupee, a man loses 20%. How many for a rupee should he sell to gain 20%.

(a) Rs. 15 (b) Rs. 10

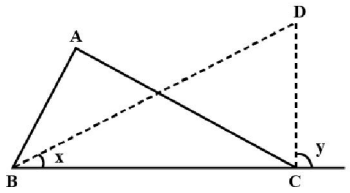
(c) Rs. 8 (d) Rs. 5

47. A boat running upstream takes 4 hours 10 minutes to cover a certain distance 2 hours, 88 minutes and 120 seconds less to cover the same distance running downstream. The ratio of speed of the boat in downstream to the speed of the boat in upstream.

(a) 13:6 (b) 19:7

(c) 17:8 (d) 11:5

48. In the adjoining figure, BD and CD are angle bisectors. Then, which of the following is true?



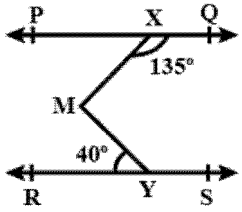
(a) $\angle D = \frac{1}{2}\angle A$

(b) $\angle x + \angle y = \angle A + \angle D$

(c) $\angle D = \frac{\angle x + \angle y}{2}$

(d) All of the above

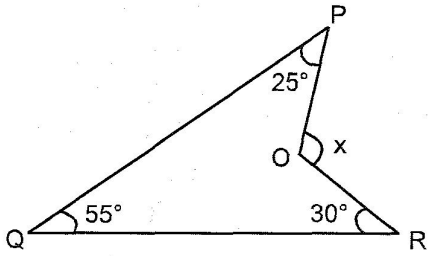
49. In the given figure if PQ || RS, $\angle$MXQ = 135° and $\angle$MYR = 40° then value of $\angle$XMY will be



(a) 95° (b) 45°

(c) 140° (d) 85°

50. In the adjoining figure, the value of x is:



(a) 250° (b) 110°

(c) 120° (d) 80°

[MAT]

Direction (Q. 51)

Two statements are given in each of the following question, followed by two conclusions I and II. You have to take the two statements to be true even, if they seems to be at variance from commonly known facts. Read the conclusions and then decide which of the given conclusion logically follows the given two statements, disregarding the known facts.

51. **Statements**

All chains are ropes.

Some links are chains.

Conclusions

I. Some ropes are links.

II. All links are ropes.

(a) If only conclusion I follows

(b) If only conclusion II follows

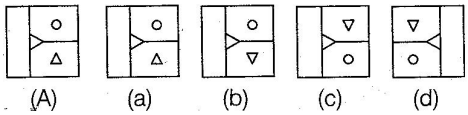
(c) If both conclusion I and II follows

(d) If none of the conclusion follows

Direction (Q. 52)

In each of the following question, a figure marked (A) is followed by four other figures (a), (b), (c) and (d) showing the possible water images of figure (A). Choose the correct water image of the figure (A) out of given four alternatives.

52.



Direction (Q. 53)

In each of the following question, you are given a combination of alphabets/numbers followed by four alternatives (a), (b), (c) and (d). Choose the alternative which resembles the mirror image of the given combination.

53. RUN69test

(a) ʇsǝʇ96NUꓤ (b) ʇsǝʇ96NUꓤ

(c) ꓤNU96ʇsǝʇ (d) ʇsǝʇ96NUꓤ

Direction (Q. 54)

In each of the following question, there is a certain relationship between two given terms on one side of (::) and one term is given on another side (::) while another term is to be found from the given alternatives having the same relation with this term as the terms of the given pair bear. Choose the correct alternative.

54. River : Stream :: Ocean : ?

(a) Current (b) Pond

(c) Dam (d) Sea

Direction (Q. 55)

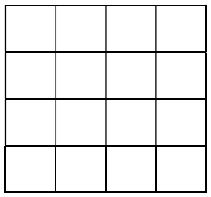
In each of the following questions, a number series is given with one of the terms missing. Choose the correct alternative that will continue the same pattern and replace the question mark (?) in the given series.

55. 0, 7, 26, 63, ?

(a) 187 (b) 96

(c) 123 (d) 124

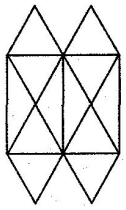
56. How many squares are there in the following figure?



(a) 16 (b) 17

(c) 26 (d) 30

57. How many triangles are there in the followig figure?



(a) 20 (b) 22

(c) 16 (d) 24

58. A, B, C, D, E and F are sitting in a row, 'E' and 'F' are in the centre and 'A' and 'B' are at the ends. 'C' is sitting on the left of 'A'. Then, who is sitting on the right of 'B'?

(a) A (b) D

(c) E (d) F

59. In a certain code, 'MOUSE' is written as 'PRUQC'. How is 'SHIFT' written in the same code?

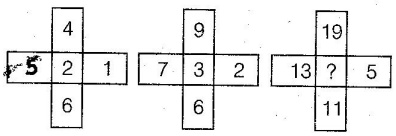
(a) VKIRD (b) VKIDR

(c) VIKRD (d) None of thes

Direction (Q. 60)

Find the missing character in each of the following question.

60.



(a) 4 (b) 6

(c) 8 (d) 10

[For Rough Work]