

FIITJEE Talent Reward Exam

for student presently in
Class 9

PAPER-2

Time: 3 Hours

Maximum Marks: 258

Instructions:

Caution: Question Paper CODE as given above MUST be correctly marked in the answer OMR sheet before attempting the paper. Wrong CODE or no CODE will give wrong results.

- You are advised to devote 1 Hour on Section-I and 2 Hours on Section-II and Section-III.**
- This Question paper consists of 3 sections. All questions will be multiple choice single correct out of four choices with marking scheme in table below:

Section		Question no.	Marking Scheme for each question		
			correct answer	wrong answer	
SECTION – I (IQ)		Q. 1 to 11	+2	0	
		Q. 12 to 17	+3	-1	
		Q. 18 to 22	+6	-2	
SECTION – II (SCIENCE & MATHEMATICS)	Part –A	Physics	Q. 23 to 27	+4	-1
	Part –B	Chemistry	Q. 28 to 32	+4	-1
	Part –C	Mathematics	Q. 33 to 37	+4	-1
	Part –D	Biology	Q. 38 to 42	+4	-1
SECTION – III (SCIENCE & MATHEMATICS)	Part –A	Physics	Q. 43 to 48	+6	-2
	Part –B	Chemistry	Q. 49 to 54	+6	-2
	Part –C	Mathematics	Q. 55 to 60	+6	-2

- Answers have to be marked on the OMR sheet.
- The Question Paper contains blank spaces for your rough work. No additional sheets will be provided for rough work.
- Blank papers, clip boards, log tables, slide rule, calculator, cellular phones, pagers and electronic devices, in any form, are not allowed.
- Before attempting paper write your Name, Registration number and Test Centre in the space provided at the bottom of this sheet.**

Note:

Check all the sheets of this question paper. Please ensure the same SET is marked on header of all the sheets inside as indicated above 'Maximum Marks' of this page. In case SET marked is not the same on all pages, immediately inform the invigilator and CHANGE the Questions paper.

Registration Number :

Name of the Candidate : _____

Test Centre : _____

SECTION – I
I.Q

Direction (1-2) : In each of the following questions, there are two words/set of letters/ numbers to the left of the sign :: which are connected in some way. The same relationship obtains between the third words/set of letters/numbers and one of the four alternatives under it. Find the correct alternative in each question.

1. PRLN : XZTV :: JLFH : ?
(A) NPRT (B) NRPT
(C) NTRP (D) RTNP
2. 14 : 9 :: 26 : ?
(A) 12 (B) 13
(C) 15 (D) 31
3. Anil, introducing a girl in a party, said, she is the wife of the grandson of my mother. How is Anil related to the girl ?
(A) Father (B) Grandfather
(C) Husband (D) Father-in-law
4. Vinod is the brother of Bhaskar. Manohar is the sister of Vinod. Biswal is the brother of Preetam and Preetam is the daughter of Bhaskar. Who is the uncle of Biswal ?
(A) Bhaskar (B) Manohar
(C) Vinod (D) Insufficient data
5. One morning after sunrise, Gopal was facing a pole. The shadow of the pole fell exactly to his right. Which direction was he facing ?
(A) South (B) East
(C) West (D) Data inadequate
6. If South-east becomes North, North-east becomes West, North-west becomes South and so on, what will West become ?
(A) North-east (B) North-west
(C) South-east (D) South-west
7. Some boys are sitting in a line. Mahendra is on 17th place from left and Surendra is on 18th place from right. There are 8 boys in between them. How many boys are there in the line ?
(A) 43 (B) 42
(C) 41 (D) 44

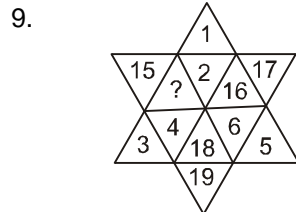
Space for Rough Work

Directions (8 – 9): Find the missing number in each of the following questions.

8.

72	24	6
96	16	12
108	?	18

- (A) 12 (B) 16
(C) 18 (D) 20



- (A) 13 (B) 14
(C) 19 (D) 21

Direction (10-11): Find out the missing term in following series :

10. 1, 3, 8, 19, 42, 89, ?
(A) 108 (B) 184
(C) 167 (D) 97
11. 8, 13, 10, 15, 12, 17, 14
(A) 19 (B) 22
(C) 16 (D) 20

Direction (12-15): A cube is coloured red on all faces. It is cut into 64 smaller cubes of equal size. Now, answer the following questions based on this statement :

12. How many cubes have no face coloured ?
(A) 24 (B) 16
(C) 8 (D) 0
13. How many cubes are there which have only one face coloured ?
(A) 4 (B) 8
(C) 16 (D) 24

Space for Rough Work

14. How many cubes have two red opposite faces ?
(A) 0 (B) 8
(C) 16 (D) 24
15. How many cubes have three faces coloured ?
(A) 24 (B) 16
(C) 8 (D) 4

Direction (16-17) : Read following information carefully and answer the questions given below it :

- (i) P, Q, R, S and T are five friends.
(ii) Q is elder to T.
(iii) R is younger to P.
(iv) P is younger to T.
(v) S is elder to P.

16. Who among the following is the eldest ?
(A) P (B) Q
(C) S (D) Data inadequate
17. Who among the following is the youngest ?
(A) P (B) R
(C) T (D) Data inadequate

Directions (18 to 22) : Read the data given below carefully and answer the questions that follow.

There are nine members – Anup, Bagha, Dulal, Elena, Fuli, Gopal, Harsh, Indira and Ketan, in a Kho-Kho team. All are sitting in a row, such that any two adjacent people are facing opposite directions.

Elena is adjacent to Indira and Anup. Ketan is adjacent to Fuli and Gopal. Bagha and Dulal are facing the same direction, where Bagha is sitting to the left of Dulal. Harsh is sitting to the immediate right of Anup.

18. Who must not sit at any of the extreme ends ?
(A) Bagha (B) Fuli
(C) Dulal (D) Indira
19. If Harsh and Bagha are adjacent, then who is sitting farthest from Dulal ?
(A) Bagha (B) Harsh
(C) Indira (D) Gopal or Fuli

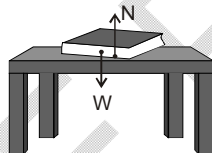
Space for Rough Work

20. If Harsh sits adjacent to Fuli, then who sits to the immediate right of Gopal ?
 (A) Bagha (B) Anup
 (C) Dulal (D) Cannot be determined
21. If Fuli is facing south, then who among the following must always face north ?
 (A) Dulal (B) Harsh
 (C) Elena (D) None of these
22. What is the minimum number of people that can sit between Dulal and Indra ?
 (A) 0 (B) 2
 (C) 3 (D) More than 3

SECTION – II
SCIENCE & MATHEMATICS (PCMB)

PHYSICS
(PART-A)

23. A book is lying on the surface of a table as shown, such that $N = W$:
 (Where W = weight of the book & N = normal reaction of table on the book)



- (A) W and N are action-reaction pair
 (B) W and N are not action-reaction pair
 (C) W and N may or may not be action-reaction pair
 (D) None of them
24. If G is Universal gravitational constant and R is the radius of the earth, then acceleration due to gravity ' g ' and the mean density of earth D are related by the equation :
- (A) $D = \frac{g}{G} \left(\frac{4\pi R^3}{3} \right)$ (B) $D = \frac{g/G}{\left(\frac{4}{3}\pi R \right)}$
 (C) $D = \left(\frac{g}{G} \right) \left(\frac{4}{3}\pi R^2 \right)$ (D) $D = \frac{g/G}{\frac{4}{3}\pi R^3}$

Space for Rough Work

25. A gardener waters the plants by a pipe of diameter 1 mm. The water comes out from the pipe at the rate of $10 \text{ cm}^3/\text{sec}$. The reactionary force exerted on the hand of the gardener is :
 (A) $1.27 \times 10^{-4} \text{ N}$ (B) 0.127 N
 (C) $1.27 \times 10^{-2} \text{ N}$ (D) Zero
26. A rubber ball is dropped from a height of 5 m on a plane where the acceleration due to gravity is not known. On bouncing it rises to a height of 1.8 metre. The ball loses its velocity on bouncing by a factor of :
 (A) $\frac{16}{25}$ (B) $\frac{2}{5}$
 (C) $\frac{3}{5}$ (D) $\frac{9}{25}$
27. The maximum vertical distance through which a fully dressed astronaut can jump on the earth is 0.5 m. If mean density of the moon is two thirds that of the earth and radius is one quarter that of the earth, the maximum vertical distance through which he can jump on the moon and the ratio of time of duration of the jump on the moon to that on the earth are :
 (A) 3m, 6 : 1 (B) 6m, 3 : 1
 (C) 3m, 1 : 6 (D) 6m, 1 : 6

**CHEMISTRY
(PART-B)**

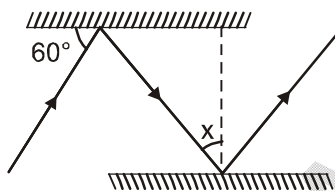
28. When heat is constantly supplied by a burner to boiling water, then the temperature of water during vaporisation :
 (A) Rises very slowly (B) Rises rapidly until steam is produced
 (C) First rises and then becomes constant (D) Does not rise at all
29. Which of the following contains minimum no. of atoms
 (A) 2.0 gm Hydrogen (B) 2.0 gm Oxygen
 (C) 2.0 gm Nitrogen (D) 2 gm CH_4
30. The simplest formula of a compound containing 50% of element of X (atomic mass = 10) and 50% of element Y (atomic mass = 20) by weight is :
 (A) XY (B) X_2Y
 (C) XY_3 (D) X_2Y_3

Space for Rough Work

31. Melting point of $\text{H}_2\text{O}(\text{s})$ associated with NaCl is :
 (A) 0°C (B) below 0°C
 (C) above 0°C (D) 100°C
32. The increasing order of inter molecular attraction of the compounds A, B, C & D, whose freezing temperatures are : 20°C , 5°C , -10°C , -25°C respectively
 (A) $D < C < B < A$ (B) $A < B < C < D$
 (C) $A < C < B < D$ (D) $A < B < D < C$

**MATHEMATICS
(PART-C)**

33. The value of x in the following figure is :

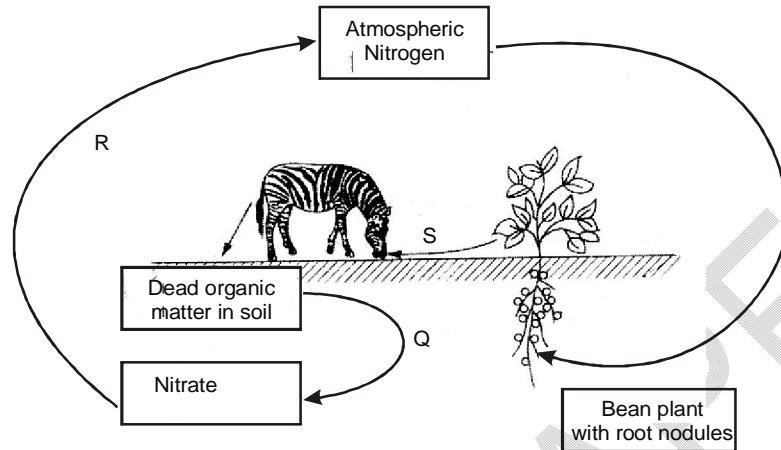


- (A) 30° (B) 45°
 (C) 60° (D) 75°
34. Factorize : $x^4 + x^2 + 1$
 (A) $(x^2 + x + 1)(x^2 - x + 1)$ (B) $(x^2 - 1 + x)(x^2 + 1 + x)$
 (C) $(x^2 - x + 1)(x^2 + x - 1)$ (D) $(x^2 + x + 1)(1 - x - x^2)$
35. In $\triangle ABC$, BO bisects $\angle ABC$ and CO bisects $\angle ACB$. then $\angle BOC$ is :
 (A) $90^\circ - \frac{\angle A}{2}$ (B) $90^\circ + \frac{\angle A}{2}$
 (C) $\frac{1}{2}\angle A$ (D) $2\angle A$
36. If $(x^n)^m = x^{n^m}$, then $n^{m-1} m^{n-1}$ is :
 (A) n^m (B) m^{n+1}
 (C) m^n (D) n^{m+1}
37. Find the unit digit of $2^{3^{4^5}}$
 (A) 8 (B) 6
 (C) 4 (D) 2

Space for Rough Work

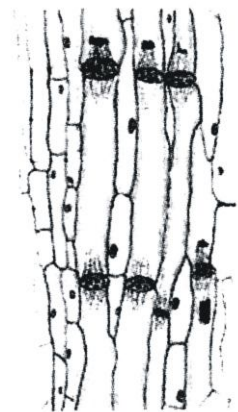
**BIOLOGY
(PART-D)**

38. Study the given diagram of the nitrogen cycle, which arrow denotes nitrogen fixation and denitrification.



- | | Nitrogen fixation | Denitrification |
|-----|--------------------------|------------------------|
| (A) | Q | S |
| (B) | R | P |
| (C) | P | R |
| (D) | S | R |

39. Find out correct statement regarding the tissue given below:
- (A) Some cells lack nucleus at maturity
 - (B) Fibres of tissue have additional deposition of suberin
 - (C) Most of the cells of tissue are dead
 - (D) Tissue conduct substance driven by transpiration pull



Space for Rough Work

40. A student was given a task of identifying a cell "A" that has twice as much DNA as in a normal functional cell.
Which of the following is true regarding cell "A"
(P) It is preparing to divide (Q) It has completed division
(R) It has reached the end of its life span (S) It has ceased to function
(A) P and S (B) Q and S
(C) P only (D) Q and R
41. Which of the following is ex situ conservation ?
(A) Animals kept in zoo
(B) Protecting birds in Chilka lake
(C) Protecting fishing in Bhitarkanika
(D) Preventing human activities in core region of biosphere reserve
42. Find out the wrong statement in concern with organic farming:
(A) manure is used as nutrient supplement
(B) Biofertilizers are used to improve soil fertility
(C) Crop rotation is practiced to exempt crop failure
(D) Biopesticides are used to check pest

SECTION – III
PHYSICS
(PART-A)

43. An object weighs 10 N at the north pole of the earth. In a geostationary satellite, at a distance $7R$ from the centre of earth (of radius R), what will be its true weight & apparent weight ?
(A) 0 N, 0 N (B) 10 N, 10 N
(C) 0.2 N, 0 N (D) 0 N, 10 N
44. The driver of a train moving at a speed v_1 sights a goods train at a distance d ahead of him on the same track moving in the same direction with a slower speed v_2 . He puts on brakes and gives his train a constant retardation a . Which of the following option is correct :
(A) $d \geq \frac{2(v_1 - v_2)^2}{2a}$ (B) $d > \frac{(v_1 - v_2)^2}{2a}$
(C) $d > \frac{2(v_1 - v_2)^2}{a}$ (D) $d \geq \frac{(v_1 - v_2)}{2a}$

Space for Rough Work

45. A person is standing on the weighing machine kept on the floor of an elevator, then match the following statements in column I with column II :

Column-I		Column-II	
(I)	Weight shown by the weighing machine is more than his actual weight when	(P)	The elevator is at rest or moving up or down with constant speed.
(II)	Weight shown by the weighing machine is less than his actual weight when	(Q)	When elevator is going up and speeding up or the elevator is going down and slowing down,
(III)	Weight shown by the weighing machine is equal to his actual weight when	(R)	The elevator is going up and speeding down or the elevator is going down and speeding up

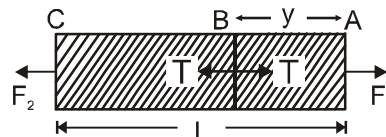
- (A) (I)-R, (II)-Q, (III)-P
 (B) (I)-Q, (II)-R, (III)-P
 (C) (I)-P, (II)-R, (III)-Q
 (D) (I)-Q, (II)-P, (III)-R
46. If a satellite is revolving around a planet of mass M in an elliptical orbit of semi-major axis a , then the orbital speed of the satellite when it is at a distance r from the focus will be given by :

(A) $v^2 = GM \left[\frac{1}{r} - \frac{1}{a} \right]$
 (B) $v^2 = \frac{G}{M} \left[\frac{1}{r} - \frac{1}{a} \right]$
 (C) $v^2 = GM \left[\frac{1}{r} + \frac{2}{a} \right]$
 (D) $v^2 = GM \left[\frac{2}{r} - \frac{1}{a} \right]$

47. Two cars A and B start with accelerations a_1 and a_2 in the same race. A reaches the finish point with velocity v more than car B, and takes t seconds less than B. Which of the following option is correct :

(A) $v^2 = a_1 a_2 t^2$
 (B) $v^2 = a_1 a_2 \sqrt{t}$
 (C) $v^2 = a_1 t^2/a_2$
 (D) $v^2 = a_1 a_2 t$

48. What is the tension in a rod of length L and mass M at a distance y from F_1 , when the rod is acted on by two unequal forces F_1 and F_2 ($< F_1$) as shown in figure.



(A) $F_2 \left(1 + \frac{y}{L} \right) + F_1 \left(\frac{y}{L} \right)$
 (B) $F_1 \left(1 + \frac{y}{L} \right) - F_2 \left(\frac{y}{L} \right)$
 (C) $F_1 \left(1 - \frac{y}{L} \right) + F_2 \left(\frac{y}{L} \right)$
 (D) $F_2 \left(1 - \frac{y}{L} \right) + F_1 \left(\frac{y}{L} \right)$

Space for Rough Work

**CHEMISTRY
(PART-B)**

49. An organic compound has the empirical formula CH. Its molecular mass is 78. Molecular formula of the compound will be
(A) CH₄ (B) C₆H₆
(C) C₄H₁₀ (D) C₆H₈
50. The formula of the sulphate of an element X is X₂(SO₄)₃. The formula of nitride of element 'X' will be :
(A) X₂N (B) XN₂
(C) XN (D) X₂N₃
51. A substance having a very low vapour pressure is expected to have :
(A) Extremely weak interparticles forces of attraction
(B) relatively small heat of vaporization
(C) a relatively high boiling point
(D) relatively high heat of evaporation
52. Which of the following pair is a volatile liquid:
(A) glycol & acetone (B) benzene & glycol
(C) glycol & biphenyl ether (D) benzene & acetone
53. Which has maximum volume at S.T.P.?
(A) 1.5 × 10²³ molecules of CO₂ (B) 1 g H₂
(C) 4 g O₂ (D) 16 g SO₃
54. a mixture of sulphur and carbon di sulphide is :
(A) Heterogeneous and shows tyndall effect
(B) Homogenous and shows tyndall effect
(C) Heterogeneous and does not show tyndall effect
(D) Homogenous and does not show tyndall effect

**MATHEMATICS
(PART-C)**

55. How many key strokes are needed to type all the integers from 1 to 1000 ?
(A) 2892 (B) 2891
(C) 2894 (D) 2893

Space for Rough Work

56. If the point (1, 1) is equidistant from the point (a + b, b - a) and (a - b, a + b), then :
 (A) a + b = 0 (B) a + b = 1
 (C) a = b (D) b - a = 1
57. If P(x) is a cubic polynomial P(1) = 0, P(-2) = 0, $P\left(\frac{3}{2}\right) = 0$, P(4) = 8, then find the value of P(2).
 (A) $\frac{9}{16}$ (B) $\frac{16}{9}$
 (C) $\frac{4}{9}$ (D) $\frac{16}{45}$
58. Evaluate : $\log_2\left(1 + \frac{1}{2}\right) + \log_2\left(1 + \frac{1}{3}\right) + \dots + \log_2\left(1 + \frac{1}{31}\right)$
 (A) 3 (B) 5
 (C) 7 (D) 4
59. The distance between the points which divide the line joining (8, -5) and (3, 5) internally and externally in ratio 3 : 2 is :
 (A) $12\sqrt{5}$ (B) $2\sqrt{5}$
 (C) $\sqrt{160}$ (D) None of these
60. If a natural number is multiplied by 18 and another by 21 and the products are added. Which one of the following number could be the sum of the products ?
 (A) 2002 (B) 2003
 (C) 2004 (D) 2005

Space for Rough Work

FIITJEE Talent Reward Exam

Class 9 PAPER-2 ANSWERS

SECTION – I I.Q

1.	D	2.	C	3.	D	4.	C
5.	A	6.	C	7.	A	8.	A
9.	B	10.	B	11.	A	12.	C
13.	D	14.	A	15.	C	16.	D
17.	B	18.	B	19.	C	20.	A
21.	A	22.	A				

SECTION – II SCIENCE & MATHEMATICS (PCMB)

23.	A	24.	B	25.	B	26.	B
27.	A	28.	D	29.	B	30.	B
31.	B	32.	A	33.	A	34.	A
35.	B	36.	C	37.	D	38.	C
39.	A	40.	C	41.	A	42.	C

SECTION – III SCIENCE & MATHEMATICS (PCM)

43.	C	44.	B	45.	B	46.	D
47.	A	48.	C	49.	B	50.	C
51.	C	52.	D	53.	B	54.	D
55.	D	56.	C	57.	D	58.	D
59.	A	60.	C				