FIITJEE ADMISSION TEST- 2021

for **students of**

Class 12

Paper 1

Time: 3 Hours (9:30 am – 12:30 pm) **Code 1200** ***Maximum Marks: 234***

Instructions:

Caution: Class, Paper, Code as given above MUST be correctly marked on the answer OMR sheet before attempting the paper. Wrong Class, Paper or Code will give wrong results.

1. **You are advised to devote 60 Minutes on Section-I, 90 Minutes on Section-II and 30 Minutes on Section-III.**

2. **This Question paper consists of 3 sections. Marking scheme is given in table below:**

Section	Subject		Question no.	Marking Scheme for each question	
				correct answer	wrong answer
SECTION – I	APTITUDE		1 to 30	**+3**	**0**
SECTION – II	PHYSICS	(PART-A)	31 to 44	**+3**	**0**
	CHEMISTRY	(PART-B)	45 to 58	**+3**	**0**
	MATHEMATICS	(PART-C)	59 to 72	**+3**	**0**
SECTION – III	PHYSICS	(PART-A)	73 to 78	**+1**	**–0.25**
	CHEMISTRY	(PART-B)	79 to 84	**+1**	**–0.25**
	MATHEMATICS	(PART-C)	85 to 90	**+1**	**–0.25**

3. 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.

4. Blank papers, clip boards, log tables, slide rule, calculator, cellular phones, pagers and electronic devices, in any form, are not allowed.

5. **Before attempting paper write your OMR Answer Sheet No., Registration Number, Name** and **Test Centre** in the space provided at the bottom of this sheet.

Note: ***Please check this Question Paper contains all 90 questions in serial order. If not so, exchange for the correct Question Paper.***

OMR Answer Sheet No. : _____

Registration Number : _____

Name of the Candidate : _____

Test Centre : _____

Recommended Time: 60 Minutes for Section – I

Section – I

APTITUDE TEST

*This section contains **30 Multiple Choice Questions** number **1 to 30**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

1. Arrange the given words in the sequence in which they occur in the dictionary.
   i. Beguile ii. Bigot
   iii. Begun iv. Bigamy
   (A) i, iii, ii, iv (B) i, iii, iv, ii
   (C) i, ii, iii, iv (D) i, iv, iii, ii

2. Various terms of an alphabet series are given with one term is missing as shown by (?). Choose the missing term out of the given alternatives.
   C, K, R, ?, C, G, J
   (A) U (B) V
   (C) W (D) X

3. There is some relationship between the two terms to the left of : : and the same relationship holds between the two terms to its right. Find out the related word from the given alternatives.
   Architect : Building : : Sculptor : ?
   (A) Museum (B) Stone
   (C) Statue (D) Chisel

4. Three of the following four are alike in a certain way and so from a group. Which is the one that does not belong to the group?
   (A) fik (B) dgi
   (C) mpr (D) knq

Space for Rough Work

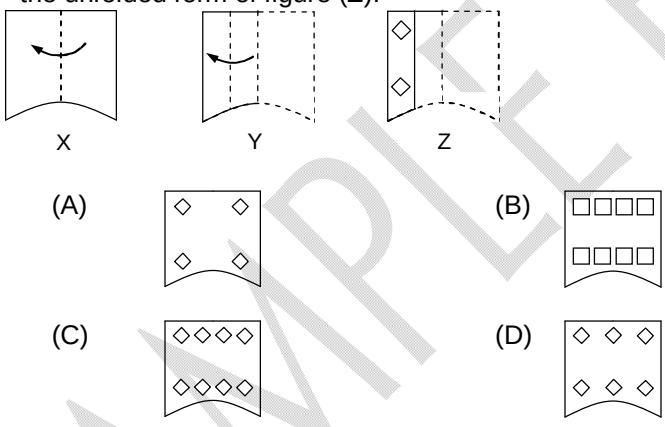
5. Ashish ranks seventh from the top and twenty-sixth from the bottom in a class. How many students are there in the class?
(A) 31 (B) 32
(C) 33 (D) 34

6. In a certain code language, "he is game" is written as "@#*", "good game play" is written as "$*&" and" play that hard" is written as "!$%". How is "good" written in that code language?
(A) & (B) *
(C) $ (D) @

7. Starting from the point X, Lalit walked 15 m towards West. He turned left and walked 20 m. He then turned left and walked 50 m. After this he turned to his left and walked 20 m. How far in which directions is now Lalit from X?
(A) 35 m, East (B) 35 m, West
(C) 42 m, North (D) 27 m, South

8. Three of the following four are alike in a certain way and so from a group. Which is the one that does not belong to the group?
(A) Perpendicular (B) Base
(C) Hypotenuse (D) Radius

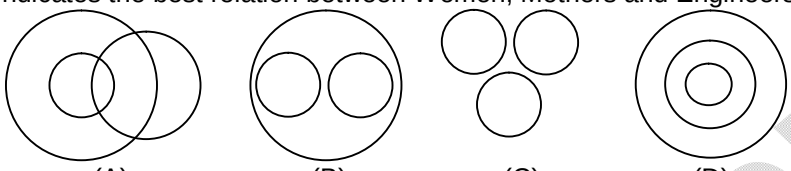
9. A set of three figures X, Y and Z showing a sequence of folding of a piece of paper. Figure (Z) shows the manner in which the folded paper has been cut. These three figures are followed by four answer figures from which you have to choose a figure which would most closely resemble the unfolded form of figure (Z).



Space for Rough Work

10. Which one set of letters when sequentially placed at the gaps in the given letter series shall complete it?
gr__jk__rj__kg__jj__
(A) gjrrk (B) jgjrk
(C) jgrrk (D) gjrjk

11. In this question given below contains three elements. These elements may or may not have some inter linkage. Each group of elements may fit into one of these diagrams at (A), (B), (C) and/or (D). You have to indicate the group of elements which correctly fits into the diagrams and indicates the best relation between Women, Mothers and Engineers?



(A) (B) (C) (D)

12. Nikhil is father in law of Tara. Tara is the wife of Rahul. How is Rahul's brother related to Nikhil?
(A) Brother (B) Father
(C) Son (D) Father-in-law

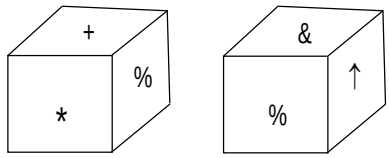
13. In a certain code language, "STATION" is written as "5313462" and "RED" is written as "789". How is "TRAIN" written in that code language?
(A) 73241 (B) 37421
(C) 37142 (D) 37412

14. If a 'truck' is called 'train', 'train' is called 'tractor', 'tractor' is called 'ship', 'ship' is called 'aeroplane', 'aeroplane' is called 'bulldozer' and 'bulldozer' is called 'scooter' which of the following can fly?
(A) Ship (B) Bulldozer
(C) Aeroplane (D) Tractor

15. If '<' means 'minus', '>' means 'plus', '=' means 'multiplied by' and '$' means 'divided by', then what would be the value of 31 > 81 $ 9 < 7?
(A) 32 (B) 33
(C) 36 (D) None of these

Space for Rough Work

16. Two positions of a dice are shown below. What will come opposite to face containing '*'?

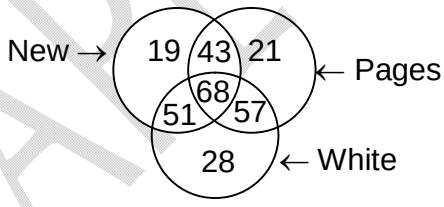


(A) ↑ (B) %
(C) + (D) &

17. How many such pairs of letters are there in the word HERITAGE each of which has as many letters between them in the word as in the English alphabet?
(A) None (B) One
(C) Two (D) Three

18. Akram is the son of Shahid. Shahid's sister, Julie has a son Zeeshan and a daughter Yana. Zeba is the sister of Zeeshan's mother. How is Yana related to Zeba?
(A) Mother (B) Granddaughter
(C) Sister (D) Niece

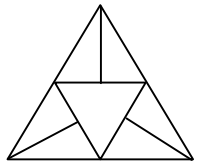
19. In the given figure, how many pages are either new or white but not both?



(A) 111
(B) 100
(C) 125
(D) 168

20. If 1st January 1813 was Tuesday, then what day of the week will be 31st December 1813?
(A) Wednesday (B) Thursday
(C) Tuesday (D) Monday

21. How many triangles are there in the given figure?



(A) 10
(B) 11
(C) 12
(D) 14

22. In the following question, select the missing number from the given alternatives.

6	15	20
8	4	5
3	5	20
51	65	?

(A) 56 (B) 120
(C) 151 (D) 154

Space for Rough Work

Directions (Q.23 to Q.24): Read the following information carefully and answer the questions.
There are six teachers in a class A, B, C, D, E and F they are of different ages but not necessarily in the same order. D's age is 3rd lowest and A's age is 5th lowest among all the ages. C is older than E and B but he is not that person who is oldest. E is not youngest.

23. Who among the following is 2nd youngest?
(A) C (B) F
(C) E (D) None of these

24. Who is the oldest teacher among the following?
(A) A (B) B
(C) C (D) F

Directions (Q.25 to Q.26): In this following questions two statements are given each followed by two conclusions I and II. You have to take the given statements to be true even if they seem to be at variance with commonly known facts. You have to decide which of the given conclusions, if any, follows from the given statements. Give answer:
(A) If only conclusion I follows.
(B) If only conclusion II follows.
(C) If neither conclusion I nor II follows.
(D) If both conclusions I and II follow.

25. Statements:
Some books are rocks.
All rocks are clips.
Conclusions:
I. Some books are clips.
II. No rock is a book.

26. Statements:
All birds are trees.
Some trees are hens.
Conclusions:
I. Some birds are hens
II. Some hens are trees.

Space for Rough Work

Directions (Q.27 to Q.28): Study the following information carefully and answer the questions given below.

Ten persons are sitting in two parallel rows containing five persons each in such a way that there is an equal distance between adjacent persons. In the first row, A, B, C, D and E are seated and all of them are facing South. In the 2nd row, P, Q, R, S and T are seated and all of them are facing North. Therefore, in the given seating arrangement, each member seated in a row faces another member of the other row. S sits third to the left of P. A faces an immediate neighbor of S. C sits second to the right of A. Only one person sits between B and D. Q and T are immediate neighbours. T does not face A and B.

27. Who amongst the following faces D?
(A) P (B) Q
(C) R (D) T

28. Which of the following is true regarding Q?
(A) P and R are immediate neighbours of Q.
(B) Q sits at one of the extreme ends of the line.
(C) E is an immediate neighbour of the person who is facing Q.
(D) S sits on the immediate left of Q.

Directions (Q.29 to Q.30): Each of the questions below consists of a question and two statements numbered I and II given below it. You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and give answer.

(A) if the data in statement I alone are sufficient to answer the question, while the data in statement II alone are not sufficient to answer the question.
(B) if the data in statement II alone are sufficient to answer the question, while the data in statement I alone are not sufficient to answer the question.
(C) if the data in both statements I and II together are not sufficient to answer the question.
(D) if the data in both statements I and II together are necessary to answer the question.

29. Statement: Six boys J, K, L, M, N, O are there in a classroom each of them is of different weights. Who among the following is the lightest?
I. M is lighter than only N and K. J is lighter than M but heavier than O.
II. M is heavier than only three boys.

30. Statement: Six persons R, S, T, U, V, W live on a six storey building such as ground floor is numbered as 1 and above it 2 floor and so on … upto top floor numbered as 6. Who lives on second floor?
I. T lives on an odd numbered floor but not on first floor. Only one person lives between W and T. R lives below W.
II. Four persons live between S and U. S lives below T. T lives above R and V.

Space for Rough Work

Recommended Time: 90 Minutes for Section – II

Section – II

PHYSICS – (PART – A)

*This part contains **14 Multiple Choice Questions** number **31 to 44.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

31. A man starts from rest with an acceleration 1 ms^{-2} at t = 0. At t = $3\sqrt{3}$ s, it appears to him that rain falls with the velocity 3 ms^{-1} vertically downwards. The velocity of actual rain fall is

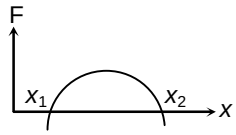
(A) $3\sqrt{3}$ ms^{-1} (B) 3 ms^{-1}

(C) 6 ms^{-1} (D) $6\sqrt{3}$ ms^{-1}

32. A completely filled closed aquarium is kept on a weighing machine. It can be assumed that the density of the fish is greater than the density of the water. The total mass of the aquarium and its content put together is M. If now all the fish start accelerating upward with a acceleration A, then choose the correct alternative.

(A) The weight recorded will be equal to Mg.
(B) The weight recorded will be less than Mg.
(C) The weight reading will be more than Mg.
(D) No conclusion can be drawn from the given information.

33. The force acting on a body moving along x-axis varies with the position of the particle as shown in the graph. The body is in stable equilibrium at

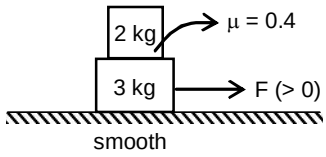


(A) $x = x_1$ (B) $x = x_2$

(C) both x_1 and x_2 (D) neither x_1 and x_2

Space for Rough Work

34. The acceleration(s) of block of 2 kg cannot be
(A) 1 m/s^2 (B) 5 m/s^2
(C) 4 m/s^2 (D) 2 m/s^2



35. A stone tied to a string of length L is whirled in a vertical circle with the other end of the string at the centre. At a certain instant of time, the stone is at its lowest position and has a speed u. The magnitude of the change in its velocity as it reaches a position where the string is horizontal is:
(A) $\sqrt{u^2 - 2gL}$ (B) $\sqrt{2gL}$
(C) $\sqrt{u^2 - gL}$ (D) $\sqrt{2\left(u^2 - gL\right)}$

36. A block of mass m moving at a velocity v collides with another block of mass 2m at rest. The lighter block comes to rest after collision. Find the coefficient of restitution
(A) 1/2 (B) 1
(C) 1/3 (D) –1/2

37. A ball falls vertically on a floor, with momentum p, and then bounces repeatedly, the coefficient of restitution is e. The total momentum imparted by the ball to the floor is
(A) p(1 + e) (B) $\frac{p}{1-e}$
(C) $p\frac{(1+e)}{(1-e)}$ (D) $p\left(1-\frac{1}{e}\right)$

38. A homogeneous chain of length 'L' lies on a table. The coefficient of friction between the chain and table is μ. The maximum length which can hang over the table in equilibrium is
(A) $\left(\frac{\mu}{\mu+1}\right)L$ (B) $\left(\frac{1-\mu}{\mu}\right)$ L (C) $\left(\frac{1-\mu}{1+\mu}\right)$ L (D) $\left(\frac{2\mu}{\mu+1}\right)$ L

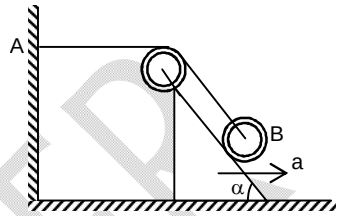
Space for Rough Work

39. Two stones are projected simultaneously with same speed 10 ms^{-1} from same point. The range of both is same and equal to $5\sqrt{3}$ m. Find the difference in their time of flight. (g = 10 m/sec^2)

(A) $\sqrt{3}$ s (B) 1 s

(C) $(\sqrt{3}-1)$s (D) 2 s

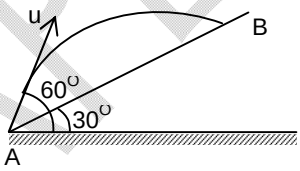
40. A weightless inextensible rope rests on a stationary wedge forming an angle α with the horizontal. One end of the rope is fixed to the wall at point A. A small load is attached to the rope at point B. The wedge starts moving to the right with a constant acceleration a. The magnitude of acceleration of the load is given by:



(A) a (B) $2a \sin\frac{\alpha}{2}$

(C) a sin α (D) g sin α

41. The time taken by the projectile to reach from A to B is t. Then the distance AB is equal to

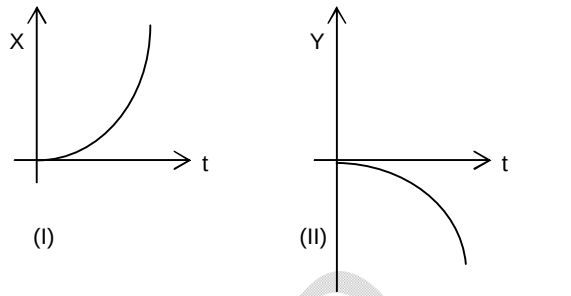


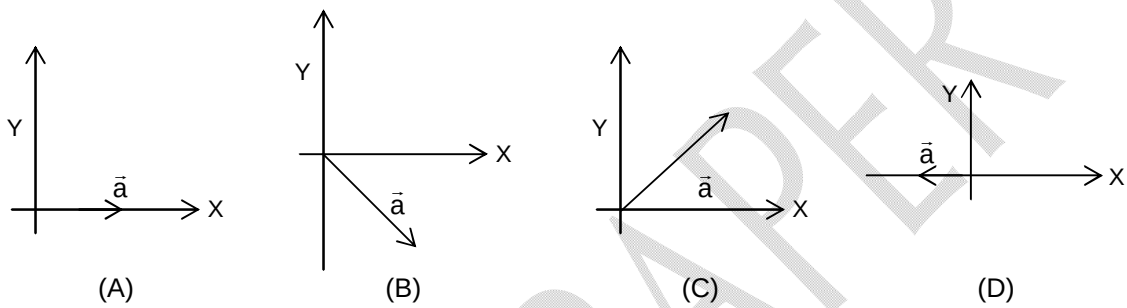
(A) $\frac{ut}{\sqrt{3}}$ (B) $\frac{\sqrt{3}\ ut}{2}$

(C) $\sqrt{3}\ ut$ (D) 2 ut

Space for Rough Work

42. Graphs I and II give coordinates x (t) and y(t) of a particle moving in the x-y plane. Acceleration of the particle is constant and the graphs are drawn to the same scale. Which of the vector shown in options best represents the acceleration of the particle:





43. A car starts from rest to cover a distance s. the coefficient of friction between the road and the tyres is μ. The minimum time in which the car can cover the distance is proportional to

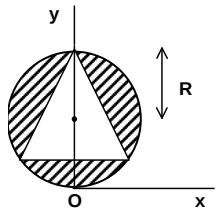
(A) μ (B) $\sqrt{\mu}$

(C) $\frac{1}{\mu}$ (D) $\frac{1}{\sqrt{\mu}}$

44. From a uniform disc of radius R an equilateral triangle of side $\sqrt{3}R$ is cut as shown. The new position of centre of mass is

(A) (0, 0) (B) (o, R)

(C) (R, 0) (D) $\left(0, \frac{\sqrt{3}}{2R}\right)$



Space for Rough Work

CHEMISTRY – (PART – B)

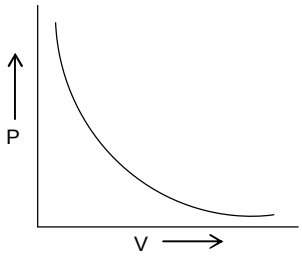
*This part contains **14 Multiple Choice Questions** number **44 to 58.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

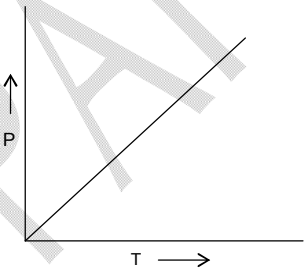
45. How many carbon atoms are present in 0.44 g carbon dioxide?
(A) 10^{-2} (B) 6.022×10^{21}
(C) 6.022×10^{25} (D) 2×10^{-2}

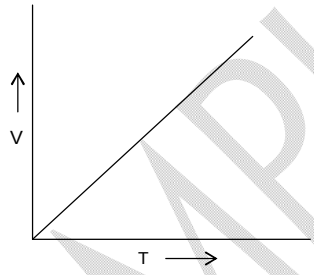
46. The smallest atom in the second period of periodic table is:
(A) Li (B) F
(C) Ne (D) Ar

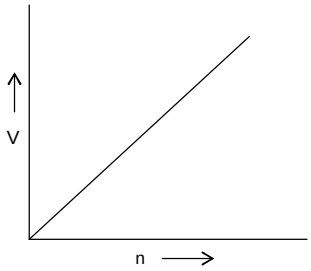
47. Which of the following molecule has the largest bond angle?
(A) BF_3 (B) CCl_4
(C) NH_3 (D) H_2O

48. Which of the following graph is correct for Charle's law?

(A) 

(B) 

(C) 

(D) 

Space for Rough Work

49. What is the oxidation number of chromium in $Na_2Cr_2O_7$?
(A) +2 (B) +4
(C) +6 (D) +7

50. A vessel contains 200 mL of 0.1 M aqueous solution of HCl. How much water is to be added to this solution in order to make the molarity of the resulting solution as 0.025 M?
(A) 400 mL (B) 600 mL
(C) 800 mL (D) 200 mL

51. What is the equivalent mass of MnO_4^- in the following reaction?

$$MnO_4^- + 5Fe^{2+} + 8H^+ \longrightarrow Mn^{2+} + 5Fe^{3+} + 4H_2O$$

[Ionic mass of MnO_4^- is 'X']

(A) $\frac{X}{4}$ (B) $\frac{X}{5}$
(C) $\frac{X}{3}$ (D) $\frac{X}{2}$

52. One mole of a gas is enclosed in a 22.4 L container at 273 K. How much pressure is produced in the container?
(A) 760 mm of Hg (B) 760 atm
(C) 760 cm of Hg (D) 760 m of Hg

53. The empirical formula of a compound is CH_2. Which of the following **CANNOT** be the molar mass of the compound?
(A) 42 (B) 56
(C) 98 (D) 82

Space for Rough Work

54. Which of the following atom has the highest first ionization energy?
(A) Na (B) N
(C) O (D) K

55. How many protons are present in the heaviest isotope of nitrogen?
(A) 8 (B) 7
(C) 9 (D) 10

56. Which of the following has the highest value of dipole moment?
(A) CO_2 (B) SO_2
(C) SO_3 (D) CCl_4

57. Which of the following element attains a full filled electronic configuration by gaining two electrons?
(A) N (B) O
(C) C (D) B

58. $3NO \longrightarrow N_2O + NO_2$
What type of reaction is given above?
(A) Intramolecular redox reaction (B) Disproportionation reaction
(C) Comproportionation reaction (D) Non-redox reaction

Space for Rough Work

MATHEMATICS – (PART – C)

*This part contains **14 Multiple Choice Questions** number **59 to 72.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

59. $\lim\limits_{x\to 3} \dfrac{\sqrt{3x}-3}{\sqrt{2x-4}-\sqrt{2}}$ is equal to

(A) $\sqrt{3}$ (B) $\dfrac{\sqrt{3}}{2}$

(C) $\dfrac{1}{2\sqrt{2}}$ (D) $\dfrac{1}{\sqrt{2}}$

60. If the set A contains 5 elements, then the number of elements in the power set P (A) is equal to

(A) 32 (B) 25

(C) 16 (D) 8

61. Let α,β be the roots of the equation $px^2+qx+r=0$. If p, q, r are in A.P. and $\dfrac{1}{\alpha}+\dfrac{1}{\beta}=4$ then the value of $(\alpha-\beta)$ is

(A) $\dfrac{2\sqrt{17}}{9}$ (B) $\dfrac{\sqrt{34}}{9}$

(C) $\dfrac{2\sqrt{13}}{9}$ (D) $\dfrac{\sqrt{61}}{9}$

62. Evaluate $\left(\log_{2-\sqrt{3}}\left(2+\sqrt{3}\right)\right)\left(\log_{3-2\sqrt{2}}\left(3+2\sqrt{2}\right)\right)$

(A) –1 (B) 1

(C) 0 (D) 9

Space for Rough Work

63. If $7x-2<4-3x$ and $3x-1<2+5x$ then x lies in the interval.

(A) $\left(\frac{3}{5},\frac{3}{2}\right)$ (B) $\left(-\frac{3}{2},\frac{3}{5}\right)$

(C) $\left[-\frac{3}{2},\frac{3}{5}\right)$ (D) $\left[-\frac{3}{2},\frac{3}{5}\right]$

64. If three positive numbers a, b, c are in A.P. such that $abc=8$ then the minimum possible value of b is

(A) $4^{2/3}$ (B) $4^{1/3}$

(C) 4 (D) 2

65. Evaluate $(1+\tan 1^o)(1+\tan 2^o)(1+\tan 3^o).....(1+\tan 45^o)$

(A) 2^{45} (B) 2^{23}

(C) 2^{22} (D) 2^{24}

66. A square, of each side 2, lies above the x – axis and has one vertex at the origin. If one of the sides passing through the origin makes an angle 30^o with the positive direction of the x – axis, then the sum of the x – coordinates of the vertices of the square is

(A) $\sqrt{3}-2$ (B) $2\sqrt{3}-1$

(C) $\sqrt{3}-1$ (D) $2\sqrt{3}-2$

67. $\lim_{x\to 0}\left(\frac{10}{9}\frac{\sin 9x}{\sin 10x}\right)\left(\frac{8}{7}\frac{\sin 7x}{\sin 8x}\right)\left(\frac{6\sin 5x}{5\sin 6x}\right)\left(\frac{4\sin 3x}{3\sin 4x}\right)\left(\frac{\sin x}{\sin 2x}\right)=$

(A) $\frac{63}{256}$ (B) $\frac{1}{6}$

(C) $\frac{6}{5}$ (D) $\frac{1}{2}$

Space for Rough Work

68. If $aN = \{ax : x \in N\}$ and $bN \cap cN = dN$, where $b, c \in N$ are relatively prime, then

(A) $b = cd$ (B) $c = bd$

(C) $d = bc$ (D) none of these

69. If α, β are the roots of the equation $x^2 + ax + b = 0$ then, $\frac{1}{\alpha^2} + \frac{1}{\beta^2} =$

(A) $\frac{a^2 - 2b}{b^2}$ (B) $\frac{b^2 - 2a}{b^2}$

(C) $\frac{a^2 + 2b}{b^2}$ (D) $\frac{b^2 + 2a}{b^2}$

70. The value of $(0.05)^{\log_{\sqrt{20}}(0.1+0.01+0.001+.....)}$ is

(A) 81 (B) $\frac{1}{81}$

(C) 20 (D) $\frac{1}{20}$

71. The solution of $\frac{6x}{4x-1} < \frac{1}{2}$ is

(A) $x < \frac{-1}{8}$ (B) $\frac{-1}{8} < x < \frac{1}{4}$

(C) $x < \frac{-1}{8}$ and $x > \frac{1}{4}$ (D) $x > \frac{1}{8}$

72. If the arithmetic mean of two numbers a and b, $a > b > 0$, is five time their geometric mean, then $\frac{a+b}{a-b}$ is equal to

(A) $\frac{\sqrt{6}}{2}$ (B) $\frac{3\sqrt{2}}{4}$

(C) $\frac{5\sqrt{6}}{12}$ (D) $\frac{7\sqrt{3}}{12}$

Space for Rough Work

Recommended Time: 30 Minutes for Section – III

Section – III

PHYSICS – (PART – A)

*This part contains **6 Multiple Choice Questions** number **73 to 78.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

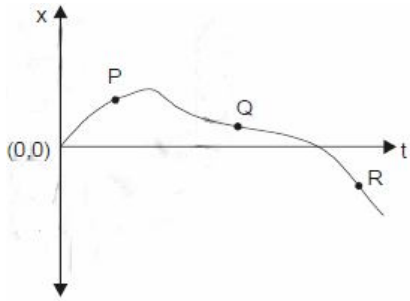
73. A parachutist with total weight 75 kg drops vertically onto a sandy ground with a speed of 2 ms^{-1} and comes to a halt over a distance of 0.25 m. the average force form the ground on her is close to (g = 10 m/sec^2)
(A) 600 N (B) 1200 N
(C) 1350 N (D) 1950 N

74. The maximum value attained by the tension in the string of a swinging pendulum is four times the minimum value it attains. There is no slack in the string. The angular amplitude of the pendulum is
(A) 90° (B) 60°
(C) 45° (D) 30°

75. A box when dropped from a certain height reaches the ground with a speed ν. When it slides from rest from the same height down a rough inclined plane inclined at an angle 45° to the horizontal, it reaches the ground with a speed $\nu/3$. the coefficient of sliding friction between the box and the plane is (acceleration due to gravity is 10 ms^{-2})
(A) $\frac{8}{9}$ (B) $\frac{1}{9}$
(C) $\frac{2}{3}$ (D) $\frac{1}{3}$

Space for Rough Work

76. In the following displacement (x) vs time (t) graph, at which among the points P, Q and R is the object's speed increasing?



(A) R only (B) P only
(C) Q and R only (D) P, Q, R

77. A block of mass m lies on the top of fixed wedge as shown in figure-1 and another identical block lies on top of identical wedge which is free to move on smooth horizontal surface as shown in figure-2. Both blocks are released from rest, i.e. from the vertical height h above the respective horizontal surface on which the wedge is placed. Let T_1 and T_2 be the time taken by the block in figure-1 and in figure-2 respectively to just reach the horizontal surface, then

(A) $T_1 > T_2$
(B) $T_1 < T_2$
(C) $T_1 = T_2$
(D) None of these

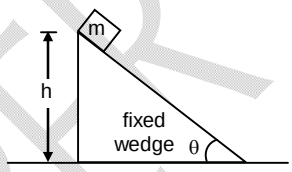


Figure - 1

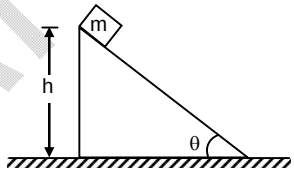
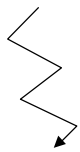


Figure - 2

78. A man inside a freely falling box throws a heavy ball towards a sidewall. The ball keeps on bouncing between the opposite walls of the box. We neglect air resistance and friction. Which of the following figures depicts the motion of the centre of mass of the entire system (man, the ball and the box)?

(A) 

(B) 

(C)

(D) 

Space for Rough Work

CHEMISTRY – (PART – B)

*This part contains **6 Multiple Choice Questions** number **79 to 84.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

79. The second ionization energy of which atom can be determined through Bohr's atomic theory?
(A) He (B) Be
(C) Li (D) B

80. What is the hybridization of sulphur in SF_4?
(A) sp^3 (B) sp^3d
(C) sp^3d^2 (D) sp^2

81. What volume of 0.4 N aqueous solution of NaOH can be completely neutralized by 200 mL of 0.2 M HCl solution?
(A) 150 mL (B) 100 mL
(C) 200 mL (D) 500 mL

82. $MnO_2 + 4HCl \longrightarrow MnCl_2 + Cl_2 + 2H_2O$
For which of the following species in the above equation, the molecular mass and equivalent mass are identical?
(A) MnO_2 (B) HCl
(C) $MnCl_2$ (D) H_2O

83. Two containers of identical volume contain separately two moles of helium and three moles of sulphur dioxide gases respectively. What will be the ratio of rate of effusion of these gases through identical orifice at constant temperature?
(A) 4 : 1 (B) 1 : 4
(C) 8 : 3 (D) 1 : 3

84. Which of the following compound contains maximum covalent character?
(A) $BeCl_2$ (B) $MgCl_2$
(C) NaCl (D) $CaCl_2$

Space for Rough Work

MATHEMATICS – (PART – C)

*This part contains **6 Multiple Choice Questions** number **85 to 90.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

85. If $\cos x + \cos^2 x = 1$, then the value of $\sin^4 x + \sin^6 x$ is equal to

(A) $-1+\sqrt{5}$ (B) $\frac{-1-\sqrt{5}}{2}$

(C) $\frac{1-\sqrt{5}}{2}$ (D) $\frac{-1+\sqrt{5}}{2}$

86. If the line $2x + y - k$ passes through the point which divides the line segment joining the points (1, 1) and (2, 4) in the ratio 3 : 2, then k equals

(A) 6 (B) $\frac{11}{5}$

(C) $\frac{29}{5}$ (D) 5

87. If the algebraic sum of distances of a variable line from points (2, 0), (0, 2) and (–2, –2) is zero, then the line passes through the fixed point

(A) (–1, –1) (B) (0, 0)

(C) (1, 1) (D) (2, 2)

88. If $0 < \theta < \frac{\pi}{2}$ and $\tan\theta + \sec\theta = p$, then $\sec\theta =$

(A) $\frac{p^2+1}{p^2}$ (B) $\frac{p^2+1}{\sqrt{p}}$

(C) $\frac{p^2+1}{2p}$ (D) $\frac{p+1}{2p}$

89. If the first and the $(2n-1)^{th}$ terms of an A.P., G.P. and H.P. are equal and their n^{th} terms are respectively a, b, c then always

(A) $a = b = c$ (B) $a \le b \le c$

(C) $a + c = b$ (D) $ac - b^2 = 0$

90. The foot of the perpendicular from the point (2, 4) upon $x + y = 4$ is

(A) (1, 3) (B) (3, –1)

(C) (2, 2) (D) (4, 0)

Space for Rough Work

FIITJEE ADMISSION TEST

CLASS – XII (PAPER – 1)

ANSWERS

1.	**B**	2.	**D**	3.	**C**	4.	**D**
5.	**B**	6.	**A**	7.	**A**	8.	**D**
9.	**C**	10.	**B**	11.	**A**	12.	**C**
13.	**C**	14.	**B**	15.	**B**	16.	**D**
17.	**D**	18.	**D**	19.	**B**	20.	**C**
21.	**B**	22.	**B**	23.	**C**	24.	**D**
25.	**A**	26.	**B**	27.	**D**	28.	**D**
29.	**C**	30.	**D**	31.	**C**	32.	**C**
33.	**B**	34.	**B**	35.	**D**	36.	**A**
37.	**C**	38.	**A**	39.	**C**	40.	**B**
41.	**A**	42.	**B**	43.	**D**	44.	**A**
45.	**B**	46.	**B**	47.	**A**	48.	**C**
49.	**C**	50.	**B**	51.	**B**	52.	**A**
53.	**D**	54.	**B**	55.	**B**	56.	**B**
57.	**B**	58.	**B**	59.	**D**	60.	**A**
61.	**C**	62.	**B**	63.	**B**	64.	**D**
65.	**B**	66.	**D**	67.	**D**	68.	**C**
69.	**A**	70.	**A**	71.	**B**	72.	**C**
73.	**C**	74.	**B**	75.	**A**	76.	**A**
77.	**A**	78.	**A**	79.	**A**	80.	**B**
81.	**B**	82.	**D**	83.	**C**	84.	**A**
85.	**D**	86.	**A**	87.	**B**	88.	**C**
89.	**D**	90.	**A**				