

FIITJEE SAMPLE PAPER – 2018

(Big Bang Edge Test / Talent Recognition Exam)

for students presently in

Class 11 (Paper 1)

Time: 3 Hours (9:30 am – 12:30 pm)

Code 1100

Maximum Marks: 417

Instructions:

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

1. This Question paper consists of 2 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	APTITUDE TEST	Q. 1 to 24	+3	0
		Q. 25 to 36	+4	0
		Q. 37 to 45	+5	0
SECTION – II (PHYSICS, CHEMISTRY & MATHEMATICS)	PHYSICS	Q. 46 to 63	+3	0
		Q. 64 to 68	+4	0
		Q. 69 to 70	+5	0
	CHEMISTRY	Q. 71 to 88	+3	0
		Q. 89 to 93	+4	0
		Q. 94 to 95	+5	0
	MATHEMATICS	Q. 96 to 113	+3	0
		Q. 114 to 118	+4	0
		Q. 119 to 120	+5	0

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.
3. Blank papers, clip boards, log tables, slide rule, calculator, cellular phones, pagers and electronic devices, in any form, are not allowed.
4. **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 120 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 : _____

Section-I**APTITUDE TEST****Straight Objective Type**

This section contains 45 multiple choice questions numbered 1 to 45. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

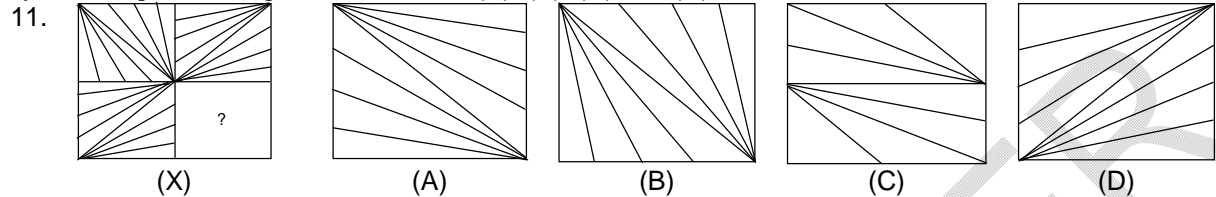
Directions (Questions 1 – 3): Select the correct alternative which will continue the series in the questions given below:

1. 2, 8, 4, 64, 7, 343, 11, 1331, 16, ____
 (A) 4286 (B) 3916
 (C) 4096 (D) 4196
2. 17, 34, 102, 408, 2040, ____
 (A) 13220 (B) 12240
 (C) 12420 (D) 12680
3. 13, 14, 22, 49, 113, ____, 454
 (A) 248 (B) 224
 (C) 256 (D) 238
4. If '-' stands for 'division', '+' for 'multiplication', '÷' for 'subtraction' and '×' for 'addition', which one of the following equations is correct?
 (A) $6 + 20 - 12 \div 7 - 1 = 38$ (B) $6 - 20 \div 12 \times 7 + 1 = 57$
 (C) $6 + 20 - 12 \div 7 \times 1 = 62$ (D) $6 \div 20 \times 12 + 7 - 1 = 70$
5. If A is B's brother, B is C's sister and C is D's father, then D is A's
 (A) Brother (B) Niece
 (C) Nephew (D) Data inadequate
6. If a year starts and ends with Sunday then how many Sundays are there in that year?
 (A) 51 (B) 52
 (C) 53 (D) Either (B) or (C)
7. In the series 10, 17, 24, 31, 38, ..., which of the following will be a number of the series?
 (A) 45 (B) 346
 (C) 574 (D) 1003
8. In a certain code language if the word 'CONCEPT' is coded as DQQGJVA, then how will you code the word 'EXECUTION' in that language?
 (A) FZHEGZZPW (B) FZHGYZPWW
 (C) FZHGZZPXW (D) FZHGZZPWW
9. If 'SLATE' is coded as 'UBPLM' then how 'TASTE' will be coded?
 (A) LPULM (B) MBUPL
 (C) MUBLP (D) LPBUM

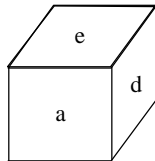
Space for Rough Work

10. In a certain code language, if the value of $13 \times 14 = 23$ and $28 \times 57 = 81$, then what is the value of 65×49 ?
 (A) 100 (B) 90
 (C) 110 (D) 120

Directions (Question 11): In the question given below, complete the missing portion of the given pattern by selecting from the given alternatives (A), (B), (C) and (D).

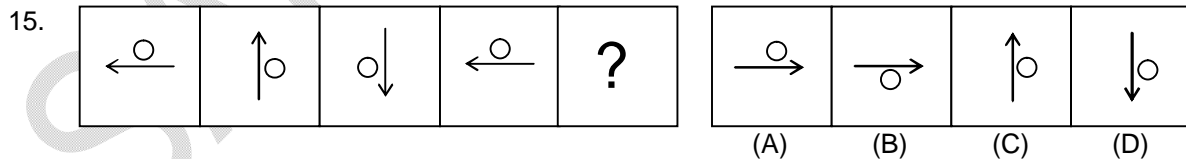


12. In a dice a, b, c and d are written on the adjacent faces, in a clockwise order and e and f at the top and bottom. When c is at the top, what will be at the bottom?

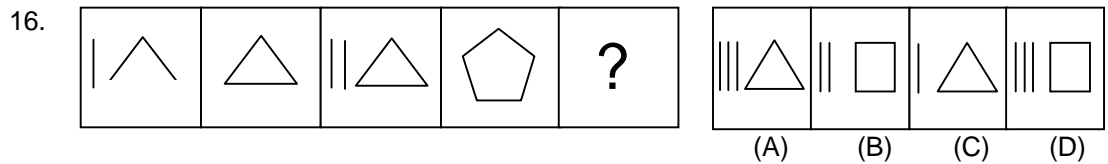


- (A) a (B) b
 (C) c (D) e
13. One evening Suma and her friend Rama are standing opposite each other. Suma found that her shadow is falling towards her right. Which direction is Rama facing?
 (A) South (B) North
 (C) East (D) West
14. A clock is so placed that at 3 P.M., the minute hand points towards North – West. In which direction does the hour hand point at 9 A.M.?
 (A) North – east (B) South – west
 (C) North (D) South

Directions (Questions 15 – 16): There are two sets of figures. One set is called the problem figures and the other set is called the answer figures marked as A, B, C, D. The problem set figures form some kind of series. Select one figure from the answer set figures which will continue the series same as given in the problem set figures.



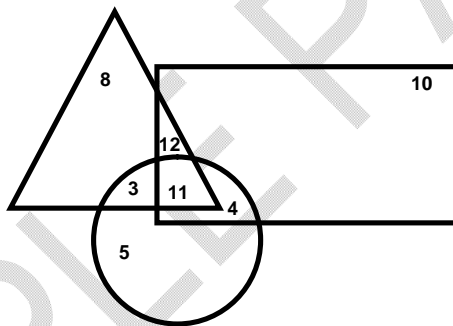
Space for Rough Work



17. Ajay ranked sixteenth from the top and twenty – ninth from the bottom among those who passed an examination. Six boys did not participate in the competition and five failed in it. How many boys were there in the class?
 (A) 40 (B) 44
 (C) 50 (D) 55
18. In a row of 35 students Rakesh when shifted by six places toward his right, then he becomes eighteenth from right. Then what was Rakesh's previous position from left before shifting?
 (A) 10 (B) 13
 (C) 12 (D) 11

Directions (Questions 19 - 20): These questions are based on the following diagram:

In the following figure, the triangle represents the students who passed in Physics, the rectangle represents the students who passed in Chemistry and the circle represents the students who passed in Mathematics in a class.



19. How many students passed in Chemistry but not in Mathematics?
 (A) 22 (B) 11
 (C) 18 (D) 17
20. How many students passed in Mathematics and Physics, but not chemistry?
 (A) 3 (B) 4
 (C) 12 (D) 14

Space for Rough Work

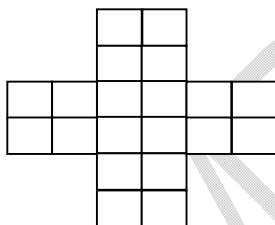
Directions (Questions 21 – 22): The questions given below consists of a question and two statements numbered I and II given below it. You have to decide whether the data provided in the statements are sufficient to answer the question.

Read both the statements and give the answer as:

- (A) If the data in statement I alone is sufficient to answer the question, while the data in statement II alone is not sufficient to answer the question;
- (B) If the data in statement II alone is sufficient to answer the question, while the data in statement I alone is not sufficient to answer the question.
- (C) If the data either in statement I alone or in statement II alone is sufficient to answer the question.
- (D) If the data given in both statements I and II together are necessary to answer the question.

21. How many New Year's greeting cards were sold this year in your shop?
 I. Last year 2935 cards were sold
 II. The number of cards sold this year was 1.2 times that of last year.
22. What is the colour of the fresh grass?
 I. Blue is called green, red is called orange, orange is called yellow.
 II. Yellow is called white, white is called black, green is called brown and brown is called purple.
23. A group of 1200 persons consisting of captains and soldiers is traveling in a train. For every 15 soldiers there is one captain. The number of captains in the group is
 (A) 85 (B) 80
 (C) 75 (D) 70
24. A number of friends decided to go on a picnic and planned to spend Rs. 960 on food. Four of them, however, did not turn up. As a consequence, the remaining ones had to contribute Rs. 40 each extra. The number of those who attended the picnic was
 (A) 8 (B) 12
 (C) 16 (D) 24

25.



The number of squares in the above figure is

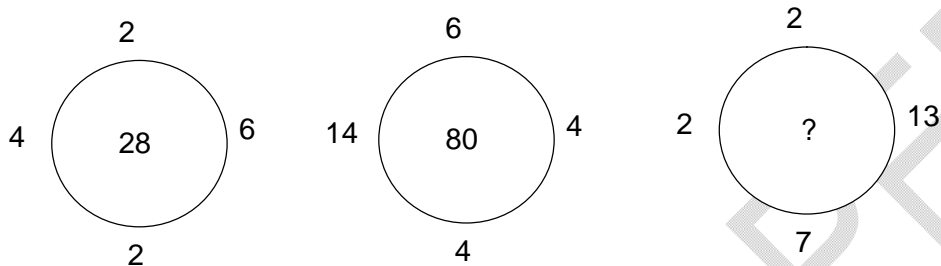
- (A) 30 (B) 29
- (C) 25 (D) 20

Space for Rough Work

26. A person walks downhill at 10 km/h, uphill at 6 km/h and on the plane at 7.5 km/h. If the person takes 3 hours to go from a place A to another place B, and 1 hour on the way back, the distance between A and B is
 (A) 15 km
 (B) 23.5 km
 (C) 16 km
 (D) Given data insufficient to calculate the distance

Directions (Questions 27 - 28): Insert the missing term in the questions given below.

27.



- (A) 40
 (C) 35

- (B) 32
 (D) 30

28.

B	C	?
O	Q	S
M	N	R

- (A) A
 (C) G

- (B) D
 (D) P

Directions (Questions 29 – 31): One hundred and twenty – five cubes of the same size are arranged in the form of cube on a table. Then a column of five cubes is removed from each of the four corners. All the exposed faces of the rest of the solid (except the face touching the table) are coloured red. Now, answer these questions based on the above statement:

29. How many small cubes are there in the solid after the removal of the columns?
 (A) 120 (B) 110
 (C) 105 (D) 100
30. How many cubes do not have any coloured face?
 (A) 12 (B) 24
 (C) 36 (D) 48

Space for Rough Work

31. How many cubes have more than two coloured faces each?
 (A) 8 (B) 20
 (C) 36 (D) 44
32. If a meaningful word can be formed by re-arranging the letters USCALA; the last letter of the word so formed is the answer. Which one is that?
 (A) C (B) S
 (C) A (D) L
33. Which one set of letters when sequentially placed at the gaps in the given letter series shall complete it?
 z y x _ w _ y z z _ x w w x y _
 (A) w x y z (B) w y x z
 (C) w x z y (D) x y z w
34. Students line up in a row in which Ashish stands fifteenth from the left and Sachin is seventh from the right. If they interchange their places, Sachin would be fifteenth from the right. How many students are there in the row?
 (A) 21 (B) 22
 (C) 29 (D) 31
35. Which of the following will not be a number of the series 1, 8, 27, 64, 125, ...?
 (A) 216 (B) 512
 (C) 729 (D) 1000
36. Starting from her office, Preethi travelled 8 m towards west, then turned right and travelled 15 m. She then travelled 20 m towards East, followed by 20 m to south to reach a hostel. How far is her office from the hostel and in which direction?
 (A) 13 m North – West (B) 60 m South
 (C) 13 m South - East (D) 63 m North East

Directions (Questions 37 – 41): These questions are based on the following information.

Five boys – Kittu, Bittu, Chintu, Dattu and Mittu went to a movie and they are sitting in a row of five chairs facing the screen.

Some information regarding the order in which these five boys entered the theatre and seated in the theater is given below.

- (i) No two boys among them went into the theatre at the same time.
 - (ii) The first and the last boy to enter the theatre are not sitting at any of the extreme ends of the row.
 - (iii) Chintu was sitting to the immediate left to Dattu.
 - (iv) Between Bittu and Mittu exactly one boy is sitting.
 - (v) The boy who came second is sitting at the extreme left of the row.
 - (vi) Bittu entered fifth and Kittu entered just before Dattu.
37. Who entered first?
 (A) Kittu (B) Chintu
 (C) Dattu (D) Mittu

Space for Rough Work

38. Who is sitting at the middle of the row?
(A) Kittu (B) Bittu
(C) Chintu (D) Dattu
39. Who is sitting at the extreme left of the row?
(A) Mittu (B) Bittu
(C) Chintu (D) Kittu
40. Who entered just before Kittu?
(A) Mittu (B) Chintu
(C) Dattu (D) Kittu
41. The boy sitting at the right end of the row is
(A) the first boy to enter the theatre (B) the second boy to enter the theatre
(C) the third boy to enter the theatre (D) the fourth boy to enter the theatre

Directions (Questions 42 – 45): These questions are based on the following information.

Seven persons – Ajit, Bhadri, Chakri, Danuj, Eshwar, Firoz and Girish, have to display their performances on seven different days – Monday, through Sunday not necessarily in the same order, starting with Monday.

- i. On each day exactly one person will perform.
 - ii. Danuj can perform either on Tuesday or on Thursday only.
 - iii. Neither Ajit nor Bhadri can perform on Sunday and between them exactly one person has to perform.
 - iv. Chakri has to perform just after Girish.
 - v. Firoz can perform neither on Monday nor on Tuesday.
 - vi. Neither Bhadri nor Eshwar can perform on Wednesday, but Bhadri can perform only after Eshwar's performance.
42. Who has to perform on Saturday?
(A) Ajit (B) Bhadri
(C) Firoz (D) Girish
43. Who is the first performer?
(A) Eshwar (B) Ajit
(C) Girish (D) Either A or B
44. Who has to perform just after Ajit?
(A) Danuj (B) Eshwar
(C) Girish (D) Firoz
45. What is the number of persons who will perform between Bhadri and Danuj?
(A) 0 (B) 1
(C) 2 (D) 3

Space for Rough Work

Section-II (Physics, Chemistry and Mathematics)

Physics

(Part - A)

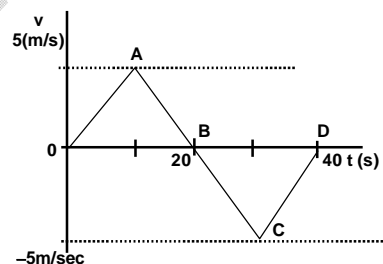
Straight Objective Type

Physics contains 25 multiple choice questions numbered 46 to 70. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

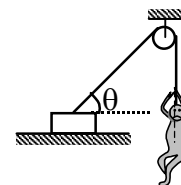
46. A force acts for 8 seconds on a body of mass 10 kg. The force then stops acting and the body moves 80 m in next 5 sec. The magnitude of the force that was acting is
 (A) 10 N (B) 5 N
 (C) 20 N (D) 30 N

47. The velocity at the maximum height of a projectile is half of it's initial velocity v . Its range on the horizontal plane is,
 (A) $\frac{2u^2}{g}$ (B) $\frac{3u^2}{g}$
 (C) $\frac{\sqrt{3} u^2}{2g}$ (D) $\frac{u^2}{3g}$

48. From the velocity time plot shown in figure find the distance traveled by the particle during the first 40 sec. Also find the average velocity during this period
 (A) 50, zero
 (B) 100 m, zero
 (C) zero, 100 m
 (D) zero, 50



49. A block of mass m rests on a rough horizontal surface with a rope tied to it. The co-efficient of friction between the surface and the block is μ . A monkey of the same mass climbs at the free end of the rope. The maximum acceleration with which the monkey can climb without moving the block is



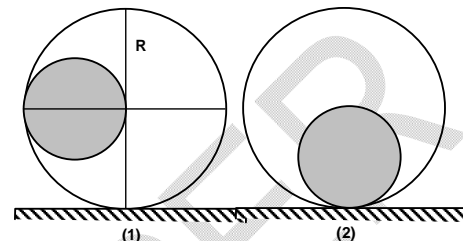
- (A) $\frac{\mu g}{\mu \sin \theta + \cos \theta} - g$ (B) $\frac{\mu g}{\mu \sin \theta - \cos \theta} + g$
 (C) $\frac{\mu g}{\tan \theta - \mu \cos \theta} + g$ (D) $\frac{\mu g}{\tan \theta + \mu \sec \theta} - g$

Space for Rough Work

50. The velocity of water waves may depend on their wavelength λ , the density of water ρ and the acceleration due to gravity g . The method of dimensions gives the relation between these quantities as

(A) $v^2 \propto \lambda g^{-1} \rho^{-1}$ (B) $v^2 \propto g \lambda$
 (C) $v^2 \propto \lambda g \rho$ (D) $v^2 \propto g^{-1} \lambda^2$

51. A ball of mass m and radius R is placed inside a spherical shell of the same mass m and inner radius $2R$. The combination is at rest on a tabletop as shown in the figure. The ball is released, rolls back and forth inside the shell. What will be the displacement of the shell, when the ball is at the bottom as shown in figure(2)?



(A) R (B) $R/2$
 (C) $R/3$ (D) $R/4$

52. The dimension of strain is same as that of

(A) Stress (B) Modulus of elasticity
 (C) Thrust (D) Angle of twist

53. The potential energy of a system of two particles is given by $U(x) = a/x^2 - b/x$. Find the minimum potential energy of the system, where x is the distance of separation; a, b are positive constants.

(A) $\frac{b}{4a^2}$ (B) $-\frac{b}{4a^2}$
 (C) $\frac{b^2}{4a}$ (D) $-\frac{b^2}{4a}$

54. The dimensions of $\frac{1}{\sqrt{\mu_0 \epsilon_0}}$ are

(A) $[^0M^0L^1T^{-1}]$ (B) $[^2M^4L^{-3}T^1]$
 (C) $[^{-2}T^{-2}L^1M^1]$ (D) $[^0M^0L^{-1}T^1]$

55. A car moving with a speed of 25 m/s take a U-turn in 5 seconds, without changing its speed. The average acceleration during these 5 sec is

(A) 10 m/sec² (B) 5 m/sec²
 (C) 2.5 m/sec² (D) 7.5 m/sec²

Space for Rough Work

56. If the linear density of a rod of length L varies as $\lambda = A + Bx$, where A and B are constants. The separation of the centre of mass from one end of the rod is

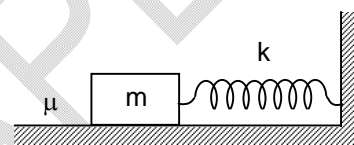
(A) $\frac{L(3A + 2BL)}{2BL + 3A}$ (B) $\frac{L(3A + 2BL)}{3(2A + BL)}$
 (C) $\frac{L B}{3 A}$ (D) $\frac{5LB}{3A}$

57. A point initially at rest moves along the x - axis. Its acceleration a varies with time as $a = 4t$. If it starts from the origin, the distance covered by it in 3 second is

(A) 12 m (B) 18 m
 (C) 24 m (D) 36 m

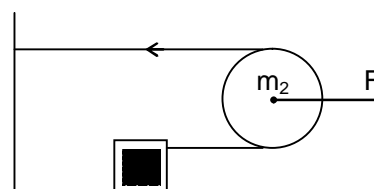
58. Find the maximum energy stored in the spring shown in the figure, for which the block remains stationary on the rough horizontal surface.

(A) $M^2g^2/2k$ (B) $\frac{mg}{k}$
 (C) mg/k^2 (D) $\frac{\mu^2 m^2 g^2}{2k}$



59. A horizontal force F is applied to a frictionless pulley of mass m_2 . The horizontal surface is smooth. The acceleration of the block of mass m_1 is n times the acceleration of the pulley. The value of n is

(A) 1 (B) 2
 (C) 3 (D) 4



60. Which of the rectangular pair may be the rectangular components of a 13 N force?

(A) 5 N, 12 N (B) 10 N, 11 N
 (C) 6.5 N, 6.5 N (D) 9 N, 12 N

61. The force F is given in terms of time t and displacement x by the equation

$F = A \cos Bx + C \sin Dt$. The dimensions of $\frac{D}{B}$ are

(A) $M^0L^0T^0$ (B) $M^0L^0T^{-1}$
 (C) $M^0L^{-1}T^0$ (D) $M^0L^1T^{-1}$

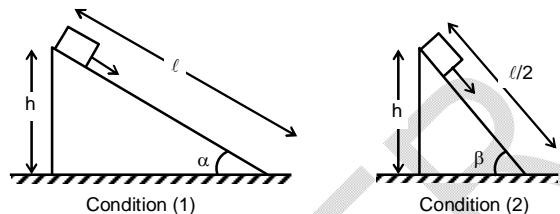
Space for Rough Work

62. A block of mass m is moving with a constant acceleration a on a frictional plane. If the coefficient of friction between the block and ground is μ , the power delivered by the external agent after a time t from the beginning is equal to:

(A) ma^2t (B) $\mu mgat$
 (C) $\mu m(a+\mu g)t$ (D) $m(a+\mu g)t$

63. Find the ratio of work done by gravity on the block under the two conditions. Assume $\mu = 0$ between block and plane.

(A) 1 : 2
 (B) 2 : 1
 (C) 1 : 1
 (D) $\alpha : \beta$

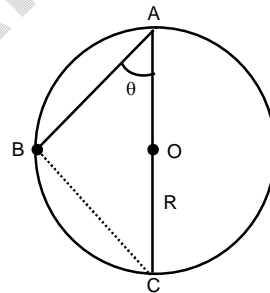


64. If vectors \vec{A} and \vec{B} are perpendicular to each other, then which of the following statements is valid?

(A) $\vec{A} \times \vec{B} = \vec{A} \cdot \vec{B}$ (B) $\vec{A} \times \vec{B} = 0$
 (C) $\vec{A} \cdot \vec{B} = 0$ (D) $\vec{A} \cdot \vec{B} = |\vec{A}| |\vec{B}|$

65. A frictionless wire AB fixed on a sphere of radius R . A very small spherical ball slips on this wire. The time taken by this ball to slip from A to B is

(A) $\frac{2\sqrt{gR}}{g \cos \theta}$ (B) $2\sqrt{gR} \frac{\cos \theta}{g}$
 (C) $2\sqrt{\frac{R}{g}}$ (D) $\frac{gR}{\sqrt{g \cos \theta}}$

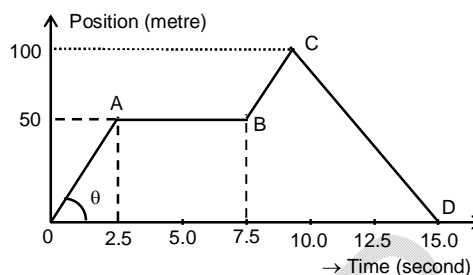


66. A person travels along a straight road for the first half time with a velocity v_1 and the second half time with a velocity v_2 . Then the mean velocity v is given by

(A) $v = \frac{v_1 + v_2}{2}$ (B) $\frac{2}{v} = \frac{1}{v_1} + \frac{1}{v_2}$
 (C) $v = \sqrt{v_1 v_2}$ (D) $v = \sqrt{\frac{v_2}{v_1}}$

Space for Rough Work

67. Figure shows the graph of the x coordinate of a particle going along the x- axis as a function of time. Find the average velocity during 0 to 10sec and instantaneous velocity at t = 2sec.



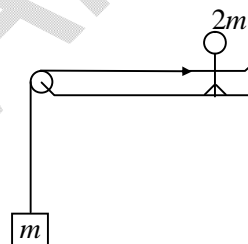
- (A) 10 m/sec, 20 m/sec.
 (B) 20 m/sec, 10 m/sec
 (C) 15 m/sec, 25 m/sec
 (D) 25 m/sec, 15 m/sec

68. A box of mass 'm' is carried by a man of mass 'M'. If he is moving up the plane with a constant velocity 'V' an on inclined plane of inclination θ with horizontal. For the time 't' and with respect to man, chose the incorrect option(s).

- (A) Work done by man on the box be $mg vt \sin \theta$.
 (B) Work done by gravity on the box is zero
 (C) Rise in potential energy of earth box system be $mg vt \sin \theta$
 (D) none of the above

69. A man of mass $2m$ is pulling up a block of mass m with constant velocity. The acceleration of man is (neglect any friction).

- (A) g
 (B) $2g$
 (C) $3g$
 (D) $\frac{g}{2}$



70. What are the dimensions of electrical permittivity?

- (A) $ML^{-2} T^{-2}Q^{-2}$
 (B) $M^{-1} L^2T^{-3}Q^{-1}$
 (C) $M^{-1} L^{-3}T^2Q^2$
 (D) $M^{-1} L^3T^{-2}Q^{-2}$

Space for Rough Work

Chemistry**(Part - B)****Straight Objective Type**

Chemistry contains 25 multiple choice questions numbered 71 to 95. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

71. Sodium oxide(Na_2O) reacts with an oxide of phosphorus(P_4O_{10}) to form the only product sodium phosphate(Na_3PO_4).
How many moles of Na_2O can completely react with one mole of P_4O_{10} ?
(A) 4 (B) 6
(C) 3 (D) 8
72. Which quantum number has different values for the unpaired electrons of sulphur (At No. of $S = 16$)
(A) Principal quantum number (B) Azimuthal quantum number
(C) Magnetic quantum number (D) Spin quantum number
73. Which of the following atom of the periodic table, in gaseous state, can easily gain electron from external source?
(A) Oxygen (B) Fluorine
(C) Chlorine (D) Iodine
74. The largest ion out of the following is:
(A) S^{2-} (B) Cl^-
(C) K^+ (D) Ca^{2+}
75. Which of the following compound has the largest value of bond angle?
(A) NF_3 (B) BF_3
(C) IF_3 (D) PF_3
76. The r.m.s velocity of a gas is represented as:
(A) $\sqrt{\frac{2RT}{M}}$ (B) $\sqrt{\frac{3RT}{M}}$
(C) $\sqrt{\frac{4RT}{M}}$ (D) $\sqrt{\frac{6RT}{M}}$
77. What is the oxidation number of sodium in Na – Hg amalgam?
(A) +1 (B) zero
(C) -1 (D) $+\frac{1}{2}$
78. The molarity of 500 mL of a solution is 0.8 M. What will be the molarity if 300 mL of water is added to the solution?
(A) 0.45 M (B) 0.5 M
(C) $\frac{4}{3}$ M (D) $\frac{3}{4}$ M

Space for Rough Work

79. What is the radius of the second orbit of He^+ ion?
 [The radius of the first orbit of H – atom = 0.529 \AA]
 (A) 1.869 \AA (B) 2.162 \AA
 (C) 1.058 \AA (D) 0.529 \AA
80. How many element(s) is/are present in the fourth period of the periodic table?
 (A) 16 (B) 12
 (C) 8 (D) 18
81. The covalent bond of which of the following molecule is most polar?
 (A) BF_3 (B) BCl_3
 (C) BBr_3 (D) BI_3
82. 200 mL of a container is filled with an ideal gas at 200 mm Hg and 200 K. How many moles of the gas is present in the container?
 (A) 3.2×10^{-6} (B) 3.2×10^{-4}
 (C) 3.2×10^{-3} (D) 3.2×10^{-5}
83. Which of the following change is called oxidation?
 (A) $\text{NH}_4^+ \longrightarrow \text{NH}_3 + \text{H}^+$ (B) $\text{Cr}_2\text{O}_7^{2-} + \text{O}^{2-} \longrightarrow 2\text{CrO}_4^{2-}$
 (C) $\text{NO}_2^- + \frac{1}{2}\text{O}_2 \longrightarrow \text{NO}_3^-$ (D) $\text{CO}_3^{2-} \longrightarrow \text{CO} + 2\text{O}^{2-}$
84. What is the sum of oxidation number of both nitrogen atoms in NH_4NO_3 ?
 (A) +2 (B) -1
 (C) -3 (D) $-\frac{1}{3}$
85. According to Hund's rule the outermost electron configuration of chromium is:
 [Atomic number of chromium = 24]
 (A)

↓↑
4s

↑↓	↑↓	↑		
3d				

 (B)

↓↑
4s

↑	↑	↑	↑	↑
3d				

 (C)

↑
4s

↑	↑	↑	↑	↑	↑
3d					

 (D)

↓↑
4s

↑	↓	↑	↓	↑
3d				
86. How many maximum no. of electrons of an atom will have $n + l = 5$?
 (A) 8 (B) 12
 (C) 10 (D) 18

Space for Rough Work

87. Which contains maximum number of electrons in antibonding molecular orbital?
 (A) N₂ (B) O₂
 (C) Li₂ (D) H₂
88. The values of successive ionization energy of a non-transition element(M) is 8.4, 10.6, 1822.9, 5400.8 etc. What is the formula of the chloride of the element?
 (A) MCl (B) MCl₂
 (C) MCl₃ (D) MCl₄
89. Consider a period of the periodic table?
 P Q R S T U V W
 The period contains non-transition elements. Which of the following is/are isoelectronic species?
 (A) R⁻, S, U²⁺, T⁺ (B) Q⁻, R²⁻, S, T²⁺
 (C) P²⁻, Q, R⁺, S²⁺ (D) R²⁻, T, S⁺, U⁺
90. $\text{MnO}_4^- + \text{C}_2\text{O}_4^{2-} + \text{H}^+ \longrightarrow \text{Mn}^{2+} + \text{CO}_2 + \text{H}_2\text{O}$
 What would be the sum of the stoichiometric coefficient of $\text{C}_2\text{O}_4^{2-}$ and CO_2 if the above equation is balanced?
 (A) 9 (B) 10
 (C) 15 (D) 12
91. According to the laws of effusion, the relative rate of effusion of two ideal gases A and B is given as:

$$\frac{r_A}{r_B} = \frac{X_A}{X_B} \sqrt{\frac{M_B}{M_A}}$$

 Which of the following property is not represented by 'X'?
 (A) No. of moles (B) Partial pressures
 (C) Mole fractions (D) Densities
92. What is the equivalent mass of (NH₄)₂Cr₂O₇ (Molecular mass = M) in the following reaction?

$$(\text{NH}_4)_2\text{Cr}_2\text{O}_7 \longrightarrow \text{Cr}_2\text{O}_3 + \text{N}_2 + 4\text{H}_2\text{O}$$

 (A) $\frac{M}{2}$ (B) $\frac{M}{4}$
 (C) $\frac{M}{6}$ (D) $\frac{M}{3}$
93. How many moles of NaOH is required to completely neutralize one mole of H₃PO₄?
 (A) 1 (B) 2
 (C) 3 (D) 4

Space for Rough Work

94.

SO ₂
CO ₂
O ₂
N ₂

A vessel contains equal mass of the above gases at a certain temperature and pressure? Which gas will exert maximum partial pressure?

(A) SO₂
(C) O₂

(B) CO₂
(D) N₂

95.

How many angular nodes or nodal planes are associated with 3p_x orbital?

(A) 1
(C) 3

(B) 2
(D) 4

Space for Rough Work

Mathematics**(Part - C)****Straight Objective Type**

Mathematics contains 25 multiple choice questions numbered 96 to 120. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

96. P and Q are points on the line segment joining A(-2, 5) and B(3, 1) such that AP = PQ = QB. The mid-point of PQ is
- (A) $\left(\frac{1}{2}, 3\right)$ (B) $\left(-\frac{1}{2}, 4\right)$
(C) (2, 3) (D) (-1, 4)
97. The value of $\frac{\sin^2 20^\circ + \cos^4 20^\circ}{\sin^4 20^\circ + \cos^2 20^\circ}$ is equal to
- (A) 1 (B) 2
(C) $\frac{1}{2}$ (D) none of these
98. The value of $\log_{3\sqrt{2}} 5832$ is equal to
- (A) 3 (B) 4
(C) 6 (D) 5
99. If the point $(2a - 3, a^2 - 1)$ and the origin are on the same side of the line $x + y = 4$, then a lies in the interval
- (A) (-4, 1) (B) (2, 4)
(C) (-4, 0) (D) (-4, 2)
100. The interior angles of a polygon are in A.P. If the smallest angle is 120° and the common difference is 5° , then the number of sides of the polygon is
- (A) 7 (B) 9
(C) 16 (D) none of these

Space for Rough Work

101. $\frac{d}{dx}(\ln \sin \sqrt{x}) =$
- (A) $\frac{\tan \sqrt{x}}{2\sqrt{x}}$ (B) $\frac{\cot \sqrt{x}}{2\sqrt{x}}$
- (C) $\frac{\tan \sqrt{x}}{\sqrt{x}}$ (D) $\frac{\cot \sqrt{x}}{\sqrt{x}}$
102. $\int \frac{4 + 5 \sin x}{\cos^2 x} dx =$
- (A) $4 \tan x - 5 \operatorname{cosec} x + c$ (B) $4 \tan x + 5 \sec x + c$
- (C) $9 \tan x + c$ (D) none of these
103. The equation of the base of an equilateral triangle is $x + y - 2 = 0$ and one vertex is $(2, -1)$. The length of the side of the triangle is
- (A) $\frac{1}{\sqrt{2}}$ (B) $\sqrt{\frac{3}{2}}$
- (C) $\sqrt{\frac{2}{3}}$ (D) $\sqrt{2}$
104. If sets A and B have 3 and 6 elements respectively, then the minimum number of elements in $A \cup B$ is
- (A) 3 (B) 6
- (C) 9 (D) 18
105. The integral value of a for which the equation $ax^2 + ax + a = 2x^2 - 3x - 6$ has equal roots, is
- (A) 3 (B) 2
- (C) -3 (D) -2
106. If $A = \sin^2 \theta + \cos^4 \theta$, then for all real values of θ ,
- (A) $1 \leq A \leq 2$ (B) $\frac{3}{4} \leq A \leq 1$
- (C) $\frac{13}{16} \leq A \leq 1$ (D) $\frac{3}{4} \leq A \leq \frac{13}{16}$

Space for Rough Work

107. If $n = 1983!$, then the digit at the unit place is ?
 (A) -1 (B) 0
 (C) 1 (D) 2
108. If $\sin \alpha + \sin \beta = a$ and $\cos \alpha - \cos \beta = b$, then $\tan \frac{\alpha - \beta}{2} =$
 (A) $-\frac{a}{b}$ (B) $-\frac{b}{a}$
 (C) $\frac{a}{b}$ (D) $\frac{b}{a}$
109. The sum of the first 'n' terms of the series $1^2 + 2.2^2 + 3^2 + 2.4^2 + 5^2 + 2.6^2 + \dots$ is $\frac{n(n+1)^2}{2}$ when 'n' is even. When 'n' is odd, the sum is
 (A) $\frac{n(n+1)^2}{4}$ (B) $\frac{n^2(n+2)}{4}$
 (C) $\frac{n^2(n+1)}{2}$ (D) $\frac{n(n+2)^2}{4}$
110. If $a \cos^2(x+y) = b$, then $\frac{dy}{dx}$ equals
 (A) 2 (B) -2
 (C) 1 (D) -1
111. $\lim_{x \rightarrow 0} \frac{\sin x}{|x|} =$
 (A) -1 (B) 0
 (C) 1 (D) doesn't exist
112. Let $R = \{(1,3), (4,2), (2,4), (2,3), (3,1)\}$ be a relation on the set $A = \{1,2,3,4\}$. The relation R is
 (A) a function (B) reflexive
 (C) not symmetric (D) transitive

Space for Rough Work

113. If $f(x) = \ln \frac{1+x}{1-x}$ and $g(x) = \frac{3x+x^3}{1+3x^2}$, then $f \circ g(x) =$
 (A) $f(x)$ (B) $2f(x)$
 (C) $4f(x)$ (D) none of these
114. If $x = \frac{4\alpha}{1+\alpha^2}$ and $y = \frac{2-2\alpha^2}{1+\alpha^2}$, where α is a real parameter, then $x^2 - xy + y^2$ lies in the interval
 (A) $[2, 6]$ (B) $[2, 4]$
 (C) $[4, 6]$ (D) none of these
115. If the equations $k(6x^2 + 3) + rx + 2x^2 - 1 = 0$ and $6k(2x^2 + 1) + px + 4x^2 - 2 = 0$ have both roots common, then the value of $(2r - p)$ is
 (A) 0 (B) $\frac{1}{2}$
 (C) 1 (D) none of these
116. The value of $\tan 82 \frac{1^\circ}{2}$ is equal to
 (A) $\sqrt{2} + \sqrt{3} + \sqrt{4} + \sqrt{6}$ (B) $(\sqrt{3} + \sqrt{2})(\sqrt{2} - 1)$
 (C) $(\sqrt{3} - \sqrt{2})(\sqrt{2} + 1)$ (D) none of these
117. The locus of the image of the point $(2, 3)$ in the line $(2x - 3y + 4) + k(x - 2y + 3) = 0$, $k \in \mathbb{R}$, is a
 (A) straight line parallel to x-axis (B) straight line parallel to y-axis
 (C) circle of radius $\sqrt{2}$ (D) circle of radius $\sqrt{3}$
118. If $\frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \dots$ upto $\infty = \frac{\pi^2}{6}$, then $\frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \dots$ upto $\infty =$
 (A) $\frac{\pi^2}{12}$ (B) $\frac{\pi^2}{24}$
 (C) $\frac{\pi^2}{8}$ (D) none of these

Space for Rough Work

119. If the equation $x^2 + px + q = 0$ has roots u and v , where p, q are non-zero constants, then

- (A) $qx^2 + px + 1 = 0$ has roots $\frac{1}{u}$ and $\frac{1}{v}$
 (B) $(x - p)(x + q) = 0$ has roots $u + v$ and uv
 (C) $x^2 + p^2x + q^2 = 0$ has roots u^2 and v^2
 (D) $x^2 + qx + p = 0$ has roots $\frac{u}{v}$ and $\frac{v}{u}$

120. The sum of all the possible products of the first 'n' natural numbers taken two at a time is

- (A) $\frac{n(n^2 - 1)(3n + 2)}{24}$ (B) $\frac{n(n + 1)(2n + 1)}{6}$
 (C) $\frac{n(n + 1)(2n - 1)(n + 3)}{24}$ (D) none of these

Space for Rough Work

FIITJEE SAMPLE PAPER – 2018

(Big Bang Edge Test / Talent Recognition Exam)

for students presently in

Class 11

ANSWERS

Paper 1

1.	C	2.	B	3.	D	4.	D
5.	D	6.	C	7.	B	8.	D
9.	A	10.	C	11.	B	12.	A
13.	A	14.	B	15.	B	16.	D
17.	D	18.	C	19.	A	20.	A
21.	D	22.	B	23.	C	24.	A
25.	B	26.	A	27.	A	28.	A
29.	C	30.	C	31.	A	32.	D
33.	A	34.	C	35.	A	36.	A
37.	B	38.	B	39.	A	40.	A
41.	D	42.	D	43.	A	44.	D
45.	C	46.	C	47.	C	48.	B
49.	A	50.	B	51.	B	52.	D
53.	D	54.	A	55.	A	56.	B
57.	B	58.	D	59.	B	60.	A
61.	D	62.	D	63.	C	64.	C
65.	C	66.	A	67.	C	68.	A
69.	D	70.	C	71.	B	72.	C
73.	C	74.	A	75.	B	76.	B
77.	B	78.	B	79.	C	80.	D
81.	A	82.	C	83.	C	84.	A
85.	C	86.	D	87.	B	88.	B
89.	A	90.	C	91.	D	92.	C
93.	C	94.	D	95.	A	96.	A
97.	A	98.	C	99.	D	100.	B
101.	B	102.	B	103.	C	104.	B
105.	A	106.	B	107.	B	108.	B
109.	C	110.	D	111.	D	112.	C
113.	D	114.	A	115.	A	116.	A
117.	C	118.	C	119.	A	120.	A