FIITJEE Big Bang Edge Test - 2022 for students presently in Class 11 (going to 12) (Paper 1)

Time: 3 Hours (9:00 am – 12:00 pm)

CODE: 1112-1

Maximum Marks: 243

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 and 120 Minutes on Section-II.
- 2. This Question paper consists of 2 sections. Marking scheme is given in table below:

Section	Subject	Question no	Marking Scheme for each question		
Section	Subject	Question no.	Correct answer	Wrong answer	
SECTION - I	APTITUDE TEST	1 to 30	+3	0	
	PHYSICS (PART-A)	31 to 47	+3	0	
SECTION - II	CHEMISTRY (PART-B)	48 to 64	+3	0	
	MATHEMATICS (PART-C)	65 to 81	+3	0	

- 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 below.

Note: Please check this Question Paper contains all 81 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.

		Space for Rou	igh Work	
	proportion. What is the (A) 8	value of X? (B) 6	(C) 4	(D) None of these
5	(A) 10 When X is subtracted	(B) 20 from the numbers 9 1	(C) 40 5 and 27 then remain	(D) 73
4.	A pupil's marks were w class got increased by	rongly entered as 83 inst half (1/2). The number of	tead of 63. Due to that t f pupils in the class is:	he average marks for the
3.	The ratio of expenditure increases by 6%, then I (A) 25	e and saving is 3 : 2. If th by how much per cent sh (B) 21	ne income increases by nould be expenditure inc (C) 12	15% and the savings creases ? (D) 24
	(i) (A) 2	(B) 3	(C) 4 (i	i) (D) 5
2.	Two positions of a dice	are shown below. If 1 is	at the bottom, which nu	mber will be on the top?
1.	Find out the missing ter 0,4,6,3,7,9,6,?,12 (A) 8	m of the series. (B) 10	(C) 11	(D) 12
	F ind and the second second	and the second second		

6. Count the number of rectangles in the given figure.



- 7. In what ratio must a person mix three kinds of tea costing Rs.60/kg, Rs.75/kg and Rs.100 /kg so that the resultant mixture when sold at Rs.96/kg yields a profit of 20%? (A) 1:2:4 (B) 3:7:6 (C) 1:4:2 (D) None of these
- 8. At what percent pr annum will Rs. 3000 amounts to Rs. 3993 in 3 years, if the interest in compounded annually? (B) 10% (A) 9% (C) 11% (D) 13%
- 9. Of the 200 candidates who were interviewed for a position at a call center, 100 had a twowheeler, 70 had a credit card and 140 had a mobile phone, 40 of them had both, a two-wheeler and a credit card, 30 had both, a credit card and a mobile phone and 60 had both, a two wheeler and mobile phone and 10 had all three. How many candidates had none of the three? (A) 0 (B) 20 (C) 10 (D) 18

Directions (10 - 14): Study the following information carefully to answer the given questions.

Eight people P. Q. R. S. T. U. V and W were born in three different months (of the same year) but not necessarily in the same order, namely March June and December such that not less than two people and not more than three people were born in a month. Each of them also likes a different fruit namely Guava, Peach, Banana, Cherry, Mango, Orange, Kiwi and apple but not necessarily in the same order.

- ⇒ Only Q and W were born in March. R likes Apple and was born in the same month as T. R was not born in December. The one who likes Mango was born in the month which has 30 days only.
- \Rightarrow U was not born in the same month as T. S likes Cherry and born in the same month as U. V does not like Mango.
- \Rightarrow The one who likes Kiwi and the one who likes Banana were born in the same month. The one who likes Kiwi was not born in the same month as W.
- ⇒ U does not like Kiwi. The one who likes Guava was born in the same month as P. Q does not like Peach. T does not like Mango.
- 10. As per the given arrangement which of the following combination represents only the people who were born in December?. (A) T, V

÷	(B) U, P, T	(C) V, U	(D) U, V, S

11.	As per the given arrang the same month as the	ement which of the follo one who likes Orange?	wing person represent th	e one who was born in	
	(A) U	(B) P	(C) R	(D) W	
12.	Which of the following f	ruits does T like as per t	he given arrangement?		
	(A) Orange	(B) Peach	(C) Guava	(D) Banana	
13.	Which of the following (A) December – Peach	combinations is correct a	s per the given arrangen	nent?	
	(C) June – Banana		(D) December – Banar	a	
14.	Who amongst the follow (A) P	ving likes Peach as per t (B) V	he given arrangement? (C) U	(D) W	
15.	I am facing South. I turn I turn left and walk 10 n 60 metre. In which dired	n right and walk 20 metro netre and then turning rig ction am I from the starti	e. Then I turn right again ght walk 20 metre. Then ng point ?	and walk 10 metre. Then I turn right again and walk	
	(A) North-East	(B) North-West	(C) North	(D) West	
16.	Point H is 6 m west of p south direction, reaches (A) 15 m	ooint F. Point J is 3 m so s a point K, takes a left tr (B) 3√5 m	uth of point D. A person urn and reaches point J. (C) 2√ 5m	starts from point H in Find KE. (D) can't be determine	
17.	Arun can finish a work the same work in 20 da work.	in 12 days; Ajit can finis ys. Find the total Time t	sh the same work in 15 o aken when all three work	days while Amit can finish c together to complete the	
	(A) 6 days	(B) 5 days	(C) 4 days	(D) 3 days	
Directi	ons (18 - 19): Study the 4 8 @ B D E ! Y I 7 * K	e following arrangemer W 6 A L 5 # 9 O 2 U ^ ©	and answer question	s given:	
18.	How many such letters	are there in the above a	rrangement each of which	h is immediately	
	(A) Four	(B) Three	(C) None	(D) One	
19.	How many such numbe (A) None	ers are there each of whi (B) One	ch is immediately preced (C) Two	led by a symbol? (D) Three	
		Space for Rou	igh Work		

(D) 4

(D) 4

Choose the alternative which is closely resembles the water-image of the given combination. **RAJ589D8**

- (A) 1
 (B) 5
 (C) 3

 (1) RAJ589D8
 (5) RAJ589D8

 (3) RAL589D8
 (5) RAJ589D8
- 21. Choose the alternative which is closely resembles the mirror image of the given combination. **EFFECTIVE**

(1) EFFECTIVE (1)	(2) EVITCEFFE	
EVITCEFFE (E)	(4) EFRECTIVE (4)	
(A) 1	(B) 2	(C) 3

20.

22. Select a figure from amongst the Answer Figures which will continue the same series as established by the five Problem Figures



23. Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



24. Select the figure which satisfies the same conditions of placement of the dots as in Figure-X.



Space for Rough Work

SAMPLE PAPER-BBE-2022-C-XI-(Paper-1)-AT+PCM-6

25.	What is the remainder	when $16^3 + 17^3 + 18^3 + 18^3$	9^3 is divided by 70 ?			
	(A) 35	(B) 2	(C) 5	(D) 0		
26.	lf 1 st April 1963 was a N (A) Saturday	londay, then which day ((B) Monday	of the week will 1 st Augus (C) Tuesday	st 1959 be? (D) Thursday		
27.	In a certain code langua the word 'INDUSTRY' i	age if the word 'CHAMBI n that language?	ER' is code as CHADBEI	, then how will you code		
	(A) IEDUIBIG	(B) IEDČSBĬG	(C) IEDCJTIG	(D) IEDCJBIG		
28.	Find out the missing ter $\frac{2}{3}, \frac{4}{7}, \frac{2}{7}, \frac{11}{21}, \frac{16}{31}$	m of the series.				
	(A) $\frac{5}{9}$	(B) <u>6</u> 11	(C) $\frac{7}{13}$	(D) $\frac{9}{17}$		
29.	An alloy of iron and nicl alloy so that percentage	kil weight 50g. It contains e of iron is increased to 9	s 80% iron. How much iro	on should be added to the		
	(A) 50 g	(B) 60 g	(C) 30 g	(D) 40 g		
30.	A earns 25% more tha more than A. A, B, C, I earned by all five of the	n B. C earns 25% more), and E earn integer am m put together?	than A. A earns 20% m ounts less than Rs. 100.	ore than D. E earns 20% What is the total amount		
	(A) Rs. 300	(B) Rs. 245	(C) Rs. 305	(D) Rs. 480		
	Space for Rough Work					

Recommended Time: 120 Minutes for Section – II

Section – II

PHYSICS - (PART - A)

This part contains **17** Multiple Choice Questions number **31** to **47**. Each question has 4 choices (A), (B), (C) and (D), out of which ONLY ONE is correct.

- 31. Two particles P and Q are projected simultaneously away Q from each other from a point A as shown in figure. The velocity of P relative to \dot{Q} in ms⁻¹ at the instant when the motion of P is horizontal is 20 ms^{-1} $20\sqrt{2}$ ms (A) $10\sqrt{4} - \sqrt{3}$ 60[°] (B) $20\sqrt{4-\sqrt{3}}$ 45° (C) $10\sqrt{4+\sqrt{3}}$ A (D) $20\sqrt{4+\sqrt{3}}$ A particle is projected with speed u at angle α with horizontal to pass over a tower of height h. 32. The product of the two possible times taken to pass over the tower is (A) $\frac{2u}{2}$ 2h(B) g g 4h(C) $\frac{u}{g}$ (D) g
- 33. A block of mass 1 kg is placed on the rough horizontal surface of a car moving with a constant acceleration a = 2m/s² starting from rest as shown. The net work done by frictional force on the block relative to ground in first 4 sec is

 (A) 8 Joule
 (B) 16 Joule
 (C) 32 Joule
 (D) 64 Joule



34. A uniform rod of length L and mass M is acted on by two unequal forces F_1 and F_2 ($F_2 < F_1$) as shown in the figure. The tension in the rod at a distance y from the end A is given by



30⁰

North

South

East

j

West

35. A particle moves in x – y plane according to the law $x = 4 \sin t$ and $y = 4(1 - \cos t)$. Then find the distance (in meter) covered by the particle in 2 seconds. (x and y are in meters) (A) 8 (B) 4

(D) 16

36. A block of mass m is pushed down on a rough inclined plane (coefficient of friction is 0.25) with a velocity v_0 as shown in the figure. Then, the block will

- (A) decelerate and come to rest
- (B) accelerate downward

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

(C) $(F_1 - F_2)\frac{y}{r}$

- (C) move downward with velocity v_0
- (D) first accelerate then decelerate
- 37. A man walking eastward at 5 m/s observes that wind is blowing from the north. On doubling his speed eastward, he observes that wind is blowing from north-east. The velocity of the wind is
 - (A) $\vec{v}_{w} = -5\hat{i} 5\hat{j}$ m/s
 - (B) $\vec{v}_{w} = 5\hat{i} + 5\hat{j}$ m/s
 - (C) $\vec{v}_{w} = 5\hat{i} 5\hat{j}$ m/s
 - (D) $\vec{v}_{w} = -5\hat{i} + 5\hat{j}$ m/s

If magnitude of vector product is $\sqrt{3}$ times the magnitude of scalar product, then angle between 38. the two vector is (A) π/2 (B) π/6 (D) π/4 (C) π/3 In the figure shown the pulley P is pulled up with an acceleration of 2 39. 2 m/s² m/s². Block A is moving down with an acceleration of 1 m/s². The acceleration of block B is: (A) 2.5 m/s² in downward direction (B) 2.5 m/s² in upward direction (C) 9 m/s² in upward direction (D) 3 m/s^2 in downward direction 1 m/s² Given $\vec{F} = (xy^2)\hat{i} + (x^2y)\hat{j}$ Newton. Find the work done by \vec{F} 40. when a particle is taken along the semicircular path OAB where the co-ordinates of B are (4, 0). (A) $\frac{65}{3}$ J> X 0 B(4,0) (C) $\frac{73}{4}$ J (D) 0 J When a body of mass M slides down an inclined plane of inclination θ , through a distance s, the 41. work done by normal reaction is: (μ is coefficient of friction) (A) zero (B) μ Mg sin θ s (C) Mg ($\mu \cos \theta - \sin \theta$)s (D) μ Mg cos θ s A block of mass 10 kg accelerates uniformly from rest to a speed of 2m/s in 20 second. The 42. average power at in time interval 0 to 20 second is (A) 10 W (B) 1 W (C) 20 W (D) 2 W 43. A particle is moving eastwards with velocity of 5 m/sec. In 10 seconds, the velocity changes to 5 m/sec northwards. The average acceleration in this time is: $\frac{1}{\sqrt{2}}$ m/sec² towards north-west (B) $\frac{1}{\sqrt{2}}$ m/sec² towards north-east (D) $\frac{1}{2}$ m/sec² towards north (C) D Space for Rough Work

44. A 1000 Kg aeroplane moves in straight flight with a constant velocity. The force of air friction is 1800 N. The net force on the plane is (A) (C) Ν

A) Zero	(B) 1800 N
C) 9000 N	(D) 3600 N



Space for Rough Work

CHEMISTRY - (PART - B)

This part contains **17** Multiple Choice Questions number **48** to **64**. Each question has 4 choices (A), (B), (C) and (D), out of which ONLY ONE is correct.

- 48. When 4 g of CaCO₃ and sand mixture is treated with excess of HCl, 0.88 g of CO₂ is produced. Calculate % weight of CaCO₃.
 (A) 40
 (B) 50
 (C) 60
 (D) 70
- 49. To obtain maximum mass of NO_2 from a given mass of a mixture of NH_3 and O_2 , the ratio of mass of NH_3 to O_2 should be

$2NH_3 + \frac{7}{2}O_2 \rightarrow 2NO_2 + 3H_2O$	
(A) $\frac{17}{40}$	(B) $\frac{4}{7}$
(C) $\frac{17}{56}$	(D) None of these

- 50. A piece of iron when kept in air increases its weight by 4.28%. What percent of iron has been rusted? (At. Wt. of Fe = 56, O = 16) Rust is Fe_2O_3 (A) 2% (B) 5% (C) 10% (D) 42.8%
- 51. Bohr radius of a shell in H-atom is 8.46 Å. The number of electrons in this shell are: (A) 2 (C) 18 (B) 8 (D) 32
- 52. Which atomic number is likely to have the following quantum numbers for the last electron?

 $\begin{pmatrix} n = 3, l = 1, m = -1, s = +\frac{1}{2} \end{pmatrix}$ (A) 11 (B) 13
(C) 17 (D) 19

53. The formation of oxide ion O²⁻(g) requires first an exothermic and then an endothermic step as shown below: $\Delta H^{\circ} = -142 \text{ kJ mol}^{-1}$ $O(q) + e^- \rightarrow O^-(q);$ $O^{-}(g) + e^{-} \rightarrow O^{2-}(g);$ $\Delta H^{\circ} = +844 \text{kJ mol}^{-1}$ This is because: (A) oxygen is more electronegative (B) Oxygen has high electron affinity (C) O⁻ ion will tend to resist the addition of another electron (D) O⁻ ion has comparatively larger size than oxygen atom 54. Elements of which set do not belong to the same group but resemble chemically in many properties? (B) Be and Al (A) Li and Mg (C) B and Si (D) All of these 55. Covalent character is maximum in (A) NaF (B) Na₂O (C) Na₃N (D) All equal The given increasing order of energies of various molecular orbitals is not true for which of the 56. following molecules? $\sigma 1s < \sigma * 1s < \sigma 2s < \sigma * 2s < (\pi 2p_x = \pi 2p_y) < \sigma 2p_z < (\pi * 2p_x = \pi * 2p_y) < \sigma * 2p_z$ $(A) B_2$ $(B) C_2$ (D) O₂ (C) N_{2} 57. In [O = C = C = C = O] state of hybridization on each carbon (A) $sp^2 sp sp^2$ (B) sp³ sp sp (D) sp² sp sp (C) sp sp sp Which of the following structures are non superimpossable (Mirror Image)? 58. Br Me Br ٠H Me н -Me но Et HC Ft Ft Me Et OF (4)Me (1)(2) (3)Mе Me (A) 1 and 2 (B) 2 and 4 (C) 1 and 4 (D) 1 and 3 Space for Rough Work



- 62. Hyperconjugation involves overlap of the following orbitals: (A) σ - σ (B) σ -p(C) p-p (D) π - π
 - $(\mathbf{C}) \mathbf{p} \mathbf{p} \tag{D} \pi^{-\pi}$
- 63. In the given compound which function group is absent?



MATHEMATICS - (PART - C)

This part contains **17** Multiple Choice Questions number **65** to **81**. Each question has 4 choices (A), (B), (C) and (D), out of which ONLY ONE is correct.

65.	The least integral value (A) 1 (C) 3	of k such that $(k - 2)x^2 +$	8x +k + 4 is positive for (B) 2 (D) 5	all real values of x is
66.	If $\log_6 16 = k$, then $\log_{18} k$	₃ 24 =		
	(A) $\frac{2(k+2)}{k-8}$	(B) $\frac{2(k+2)}{8-k}$	(C) $\frac{k+8}{k}$	(D) $\frac{k}{k+8}$
67.	If $\cos\theta - \sin\theta = \sqrt{2} \sin\theta$; Then the value of cose	θ + sin θ is equal to;	
	(A) $\sqrt{2} \cos\theta$ (C) $2 \cos\theta$		(B) $-\sqrt{2} \cos\theta$ (D) none of these	
68.	The equations of the $2x - 3y = 7$. The line $3x$ (A) incentre (C) circumcentre	lines representing the si + 2y = 0 always passes	ides of a triangle are 3 through the (B) centroid (D) orthocentre	x - 4y = 0, x + y = 0 and
69.	Value of $(1 + \tan 21^\circ)(1 - \tan 21^\circ)$	+ tan22º)(1+ tan23º)(1+	tan 24°) is	
	(A) 4	(B) 2	(C) 1	(D) 0
70	Find value of $\left(1 + \cos\frac{\pi}{9}\right)$	$\left \left(1 + \cos \frac{3\pi}{9} \right) \left(1 + \cos \frac{5\pi}{9} \right) \right $	$\left(1+\cos\frac{7\pi}{9}\right)?$	
	(A) $\frac{9}{16}$	(B) $\frac{11}{16}$	(C) $\frac{13}{16}$	(D) $\frac{5}{16}$
71.	$\lim_{x\to 0} \frac{\tan x - \sin x}{x^3} \text{ equals}$			
	(A) $\frac{1}{2}$	(B) 0	(C) 1	(D) 2
		Space for Rou	gh Work	

72.	If A and B are two sets	and A ^c denotes compler	nent of set A, then $A \cap (A)$	$A \cup B ig)^{\circ}$ equals		
	(A)	(B) A	(C) B	(D) $A \cap B$		
73.	$\lim_{x \to \frac{\pi}{2}} \frac{1 + \cos 2x}{\left(\pi - 2x\right)^2} \text{ equals}$					
	(A) 2	(B) 0	(C) 1	(D) $\frac{1}{2}$		
74.	If $x^2 - \sqrt{3}x + 1 = 0$, then	value of $x^{2020} + x^{2014} + x^{2014}$	$x^{2008} + x^{2002}$ is			
	(A) 0	(B) √3	(C) 1	(D) 2		
75.	Find minimum value of	$\sin^4 x + \cos^4 x$?				
	(A) 1	(B) $\frac{1}{2}$	(C) $\frac{1}{4}$	(D) 0		
76.	Value of $\lim_{x \to a} \frac{\sqrt{a + 2x} - x}{\sqrt{3a + x} - x}$	$\frac{\sqrt{3x}}{2\sqrt{x}}$?				
	(A) $\frac{2}{3\sqrt{3}}$	(B) $\frac{1}{3\sqrt{3}}$	(C) $\frac{2}{\sqrt{3}}$	(D) 6√3		
77.	In a class, 63% students study physics and 76% students study chemistry. If x% students study					
	both subjects, then (A) $x \le 35$	(B) x = 64	(C) $39 \le x \le 63$	(D) $x \ge 64$		
78.	If $a - b$, $b - c$, $c - a$ are in A.P., then the straight line $(a - b)x + (b - c)y + (c - a) = 0$ will pass					
	through (A) (1, 2) (C) (2, 3)		(B) (2, 1) (D) (3, 1)			
79.	The incentre of the tria	ngle formed by the lines	y = x and $y = 1$ is			
	(A) (0, 2 - √2)		(B) $(2 - \sqrt{2}, 0)$			
	(C) $(2 + \sqrt{2}, 0)$		(D) (0, 2 + $\sqrt{2}$)			
80.	If the sum of the recipro	ocals of the intercepts ma	ade by a line on the coor	dinate axes is 1/5, then		
	the line (A) (5, -5)	,	always passes through (B) (-5, 5)			
	(C) (-5,-5)		(D) (5, 5)			
81.	Equation of a line pas perpendicular to the lir	sing through the interse ne y = 2x +k is	ction of the lines 2x +y =	3 and $x + y = 1$ and		
	(A) $x - 2y = 0$ (C) $y - x = 0$		(B) $x + 2y = 0$ (D) $y + x = 0$			
	(-/ J •					

FILTJEE Big Bang Edge Test - 2022 for students presently in Class 11 (going to 12) (Paper 1) SAMPLE PAPER ANSWER KEY

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