BIG BANG
EDGE TEST

SAMPLE PAPER
For Students presently in Class XI

Paper 1 **Other Engineering Entrance Exam & JEE Main**

Duration : 75 minutes **Paper Code: 1112-1** *Maximum Marks : 156*

Please read the instructions and guidelines carefully :

Important Note : Please ensure to accurately input the details for the Question Paper Code as indicated at the top of this sheet (Side 2) into the corresponding columns / fields on the OMR sheet before proceeding with the paper. Incorrectly filled information regarding the class or paper may result in inaccurate outcomes or results.

"This paper has been scientifically designed to evaluate your potential – manifested and hidden for the target examinations mentioned in various sections of the paper. Thus, your adherence to the instructions is critical in the evaluation of the same"

1. This Question paper consists of 2 sections.
2. Student should devote allotted time for each section. If a section is easy, then it is easy for everyone & was meant to be like that with a goal in mind. Do not switch over to another section if you find the section to be easy. If a section is tough, then it is tough for everyone. You are advised to spend 30 Minutes on Section-I & 45 Minutes on Section-II. Dedicating the required time to finish each section successfully is essential. Opening the next section before completing the allotted time for the preceding section is not permitted. This adherence is crucial for assessing your true potential, as each section is meticulously crafted to evaluate your potential for the corresponding competitive examinations.
3. Candidate should open the seal of Section-II only after devoting 30 minutes on Section-I.
4. Sheets will be given to each candidate for rough work. Candidate must fill all details on the rough sheet and submit the same to invigilator along with OMR sheet. Candidate must mention the Question No. while doing the rough work in the sheet.
5. Please note candidates are not allowed to bring any prohibited items into the exam hall such as electronic devices, mobile phones, smart watch, earphones, calculators, books, notes, formula sheets, and bags.
6. Marking scheme is given in table below:

Section	Subject		Question no.	Marking Scheme for each question	
				Correct answer	Wrong answer
SECTION – I (Other Engineering Entrance Exam) Time Allotted: 30 Minutes	PHYSICS	(PART-A)	1 to 3	+4	–1
	CHEMISTRY	(PART-B)	4 to 6	+4	–1
	MATHEMATICS	(PART-C)	7 to 9	+4	–1
	PHYSICS	(PART-D)	10 to 11	+4	–1
	CHEMISTRY	(PART-E)	12 to 13	+4	–1
	MATHEMATICS	(PART-F)	14 to 15	+4	–1
SECTION – II (JEE Main) Time Allotted: 45 Minutes	PHYSICS	(PART-A)	16 to 19	+4	–1
	CHEMISTRY	(PART-B)	20 to 23	+4	–1
	MATHEMATICS	(PART-C)	24 to 27	+4	–1
	PHYSICS	(PART-D)	28 to 31	+4	–1
	CHEMISTRY	(PART-E)	32 to 35	+4	–1
	MATHEMATICS	(PART-F)	36 to 39	+4	–1

Section – I

Time: 30 Minutes

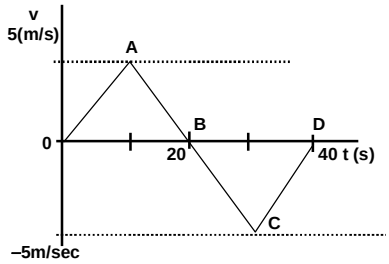
PHYSICS (PART – A)

*This part contains **3 Multiple Choice Questions** number **1 to 3.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

1. 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

2. 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) $\frac{u^2}{3g}$

3. 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



CHEMISTRY – (PART – B)

*This part contains **3 Multiple Choice Questions** number **4 to 6.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

4. 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

5. The largest ion out of the following is:
   (A) S^{2-} (B) Cl^-
   (C) K^+ (D) Ca^{2+}

6. What is the oxidation number of sodium in Na – Hg amalgam?
   (A) +1 (B) zero
   (C) -1 (D) +1/2

MATHEMATICS (PART – C)

*This part contains **3 Multiple Choice Questions** number **7 to 9.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

7. *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) $(-1, 4)$

8. The value of $\frac{\sin^2 20° + \cos^4 20°}{\sin^4 20° + \cos^2 20°}$ is equal to

(A) 1 (B) 2

(C) $\frac{1}{2}$ (D) none of these

9. The value of $\log_{3\sqrt{2}} 5832$ is equal to

(A) 3 (B) 4

(C) 6 (D) 5

PHYSICS (PART – D)

*This part contains **ONE (01)** comprehension**.** Based on comprehension, there are **TWO (02)** questions of **Multiple Choice Questions**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

Comprehension for Q. No. 10 to 11

In day-to-day life, we talk of labourers doing different types of work. If ten labourers keep on pushing a fixed wall from morning to evening with zero result, they are paid. But from physics point of view, no work is done, as the displacement is zero even if forces are applied. If the body is free to move, then force changes its momentum and hence its kinetic energy, which depends upon its motion. Thus, to change the kinetic energy of a body, a force is required to displace it. Force acting on a body gives the idea of work done and power supplied, which is certainly not the power which we discuss in day-to-day life.

Based on the above comprehension answer the following questions.

10. Which of the following is true for a body's kinetic energy and linear momentum?
(A) The body can have KE without having linear momentum.
(B) The body can have linear momentum without having kinetic energy.
(C) The body can have KE and linear momentum simultaneously.
(D) Instantaneous KE depends upon force but linear momentum does not.

11. The momentum of a particle is given by $\left(5t\hat{i} + 5t^2\hat{j}\right)$ from t = 0 to t = 2 sec. A force of $10\left(\hat{i} + t^2\hat{j}\right)$ acts on it for next 2 seconds. Its kinetic energy at t = 4 sec can be found out by
(A) conservation of energy only
(B) work–energy theorem only
(C) both COE and work–energy theorem
(D) neither COE nor work–energy theorem.

CHEMISTRY (PART – E)

*This part contains **ONE (01)** comprehension. Based on comprehension, there are **TWO (02)** questions of **Multiple Choice Questions**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

Comprehension for Q. No. 12 to 13

Vitamin C (M = 176) is a compound of C, H and O found in many natural source, especially citrus fruits. When a 1.0 g sample of vitamin C is placed in a combustion chamber and burned, the following data are obtained

Mass of CO_2 absorber after combustion = 85.35 g
Mass of CO_2 absorber before combustion = 83.85 g
Mass of H_2O absorber after combustion = 37.96 g
Mass of H_2O absorber before combustion = 37.55 g

12. What is the percentage of carbon, by wt. in vitamin C?
(A) 66.67% (B) 40.8%
(C) 20% (D) 60%

13. What is the empirical formula of vitamin C?
(A) CH_2O (B) $C_3H_4O_3$
(C) $C_6H_4O_6$ (D) CHO

MATHEMATICS (PART – F)

*This part contains **ONE (01)** comprehension. Based on comprehension, there are **TWO (02)** questions of **Multiple Choice Questions**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

Comprehension for Q. No. 14 to 15

Consider a fixed point A on a variable straight line $ax+by+c=0$, which always satisfies the relation $a-2b+c=0$. A triangle ABC is drawn such that the equation of perpendicular bisectors of sides AB and AC are $x-y=0$ and $x+y=0$ respectively.

14. Point A will be
(A) (–1, 2) (B) $(1,-2)$
(C) $(2,-1)$ (D) $(-2,1)$

15. Equation of side BC is
(A) $2x-y=0$ (B) $2x+y=0$
(C) $x-2y=0$ (D) $x+2y=0$

Section – II

Time: 45 Minutes

PHYSICS (PART – A)

*This part contains **4 Multiple Choice Questions** number **16 to 19.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

16. 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) $v^2 \propto g^{-1}\lambda^2$

17. 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) $\frac{-b^2}{4a}$

18. 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/sec^2 (B) 5 m/sec^2

(C) 2.5 m/sec^2 (D) 7.5 m/sec^2

19. 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

CHEMISTRY (PART – B)

*This part contains **4 Multiple Choice Questions** number **20 to 23.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

20. Which of the following compound has the largest value of bond angle?

(A) NF_3 (B) BF_3

(C) IF_3 (D) PF_3

21. 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) $\frac{3}{4}M$

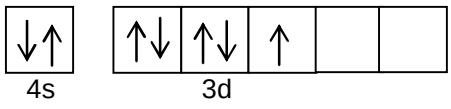
22. What is the radius of the second orbit of He^+ ion?

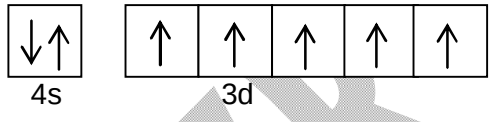
[The radius of the first orbit of H – atom = 0.529 $\overset{o}{A}$]

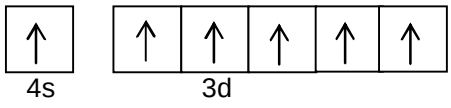
(A) 1.869 $\overset{o}{A}$ (B) 2.162 $\overset{o}{A}$

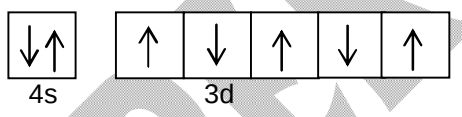
(C) 1.058 $\overset{o}{A}$ (D) 0.529 $\overset{o}{A}$

23. According to Hund's rule the outermost electron configuration of chromium is:
[Atomic number of chromium = 24]

(A) 

(B) 

(C) 

(D) 

MATHEMATICS (PART – C)

*This part contains **4 Multiple Choice Questions** number **24 to 27.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

24. 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) $(-4,2)$

25. 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) $\sqrt{2}$

26. 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

27. If $\sin\alpha + \sin\beta = a$ and $\cos\alpha - \cos\beta = b$, then $\tan\frac{\alpha-\beta}{2} =$

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

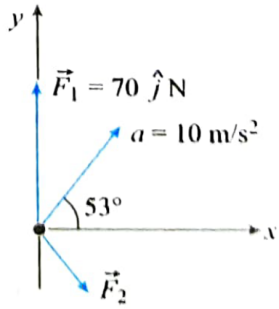
(C) $\frac{a}{b}$ (D) $\frac{b}{a}$

PHYSICS (PART – D)

*This part contains **TWO (02)** comprehensions. Based on each comprehension, there are **TWO (02)** questions of **Multiple Choice Questions**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

Comprehension for Q. No. 28 to 29

A particle of m = 5 kg is momentarily at rest at x = 0 at t = 0. It is acted upon by two forces $\vec{F}_1$ and $\vec{F}_2$. $\vec{F}_1 = 70\hat{j}N$. The direction and magnitude of $\vec{F}_2$ are unknown. The particle experiences a constant acceleration $\vec{a}$, in the direction as shown. Neglect gravity.



28. Find the missing force $\vec{F}_2$.

(A) $\left(20\hat{i} - 30\hat{j}\right)N$ (B) $\left(25\hat{i} + 40\hat{j}\right)N$

(C) $\left(30\hat{i} - 30\hat{j}\right)N$ (D) $\left(30\hat{i} - 20\hat{j}\right)N$

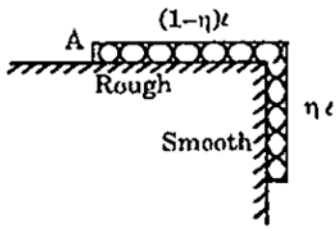
29. What is the velocity vector of the particle at t = 10 sec?

(A) $\left(30\hat{i} + 50\hat{j}\right)m/s$ (B) $\left(50\hat{i} + 75\hat{j}\right)m/s$

(C) $\left(30\hat{i} - 45\hat{j}\right)m/s$ (D) $\left(60\hat{i} + 80\hat{j}\right)m/s$

Comprehension for Q. No. 30 to 31

A uniform chain of length l which has λ mass per unit length rests on a rough table so that one end hangs over the edge. The chain slides off the table all by itself when η fraction of the length of the chain hangs, as shown in the figure. The chain starts sliding from rest.



30. What will be the value of coefficient of friction of rough surface?

(A) $\frac{\eta}{1-\eta}$ (B) $\frac{\eta}{1+\eta}$

(C) $\frac{1-\eta}{1+\eta}$ (D) $\frac{1-\eta}{\eta}$

31. What will be the work done against friction till the end A of the chain leaves the table?

(A) $\frac{\lambda g l^2 \eta(1+\eta)}{4}$ (B) $\frac{\lambda g l^2 (1-\eta)^2}{4}$

(C) $\frac{\lambda g l^2 (1-\eta)^2}{2}$ (D) $\frac{\lambda g l^2 \eta(1-\eta)}{2}$

CHEMISTRY (PART – E)

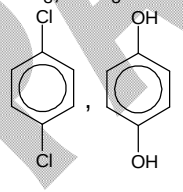
*This part contains **TWO (02)** comprehensions. Based on each comprehension, there are **TWO (02)** questions of **Multiple Choice Questions**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

Comprehension for Q. No. 32 to 33

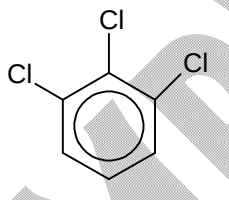
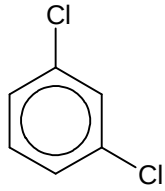
Heteroatomic covalent molecules have some ionic character which is measured in terms of its dipole moment. The ionic character is due to shifting of electron cloud towards A or B in a molecule AB due to electronegativity difference between A and B.

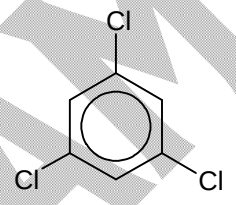
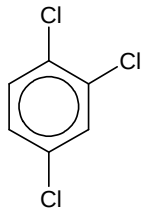
32. Select the pairs for which the dipole moment of first species is greater than second?

(A) NH_3, NF_3 (B) BF_3, BCl_3

(C) trans-but-2-ene, cis-but-2-ene (D) 

33. Among the molecule given below, select the molecule for which $\mu = 0$

(A)  (B) 

(C)  (D) 

Comprehension for Q. No. 34 to 35

$KMnO_4$ reacts with $Na_2S_2O_3$ in acidic, basic and aqueous media. 100 ml of $KMnO_4$ reacts with 100 ml of 0.1 M $Na_2S_2O_3$ in acidic, neutral and basic medium.

34. The molarity of $KMnO_4$ in acidic medium is

(A) 0.2 M (B) 0.02 M

(C) 0.4 M (D) 0.04 M

35. The molality of $KMnO_4$ in the acidic medium is ($\rho_{solution}$ = 1.58 g/ml, mol. wt. of $KMnO_4$ = 158)

(A) 0.0025 (B) 0.25

(C) 0.12 (D) 0.012

MATHEMATICS (PART – F)

*This part contains **TWO (02)** comprehensions. Based on each comprehension, there are **TWO (02)** questions of **Multiple Choice Questions**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

Comprehension for Q. No. 36 to 37

Let a, b, c are respectively the sines and p, q, r are respectively the cosines of $\alpha, \alpha+\frac{2\pi}{3}$ and $\alpha+\frac{4\pi}{3}$. then

36. The value of a + b + c =
(A) 0 (B) 3/4
(C) 1 (D) None of these

37. The value of ab + bc + ca is
(A) 0 (B) –3/4
(C) –1/2 (D) –1

Comprehension for Q. No. 38 to 39

If $[\cdot]$ denotes greatest integer function then evaluate given values

38. If $a=\log_{245}175$ and $b=\log_{175}875$, then $\left[\frac{1+3ab}{a}\right]$ is equal to
(A) 1 (B) 3
(C) 5 (D) None of these

39. If $3^a=4, 4^b=5, 5^c=6, 6^d=7, 7^e=8$ and $8^f=9$ then $\left[\frac{5abcdef}{3}\right]$ is equal to
(A) 1 (B) 3
(C) 5 (D) None of these

BIG BANG EDGE TEST

SAMPLE PAPER

For Students presently in Class XI

Paper 1 Other Engineering Entrance Exam & JEE Main

Paper Code: 1112-1

ANSWER KEYS

1.	**C**	2.	**C**	3.	**B**	4.	**B**
5.	**A**	6.	**B**	7.	**A**	8.	**A**
9.	**C**	10.	**C**	11.	**B**	12.	**B**
13.	**B**	14.	**B**	15.	**D**	16.	**B**
17.	**D**	18.	**A**	19.	**B**	20.	**B**
21.	**B**	22.	**C**	23.	**C**	24.	**D**
25.	**C**	26.	**B**	27.	**B**	28.	**C**
29.	**D**	30.	**A**	31.	**D**	32.	**A**
33.	**C**	34.	**B**	35.	**D**	36.	**A**
37.	**B**	38.	**C**	39.	**B**		