

Sample Paper

for Students presently in Class X



Basic School, CUET, JEE Main

Duration : 90 minutes

Maximum Marks : 240

Please read the instructions and guidelines carefully :

Important Note : Please ensure to accurately input the details for the Class and Paper No. as indicated at the top of this sheet 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 3 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, 30 Minutes on Section-II and 30 Minutes on Section-III. 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 and Seal for Section-III is to be opened only after devoting 30 minutes on Section-II.
- 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:

Sastian		~~*	Question	Marking Scheme for each question		
Section	Subj	ect	no.	Correct answer	Wrong answer	
	PHYSICS	(PART-A)	1 to 10	+1	0	
SECTION - 1 (Basic School) Time Allotted: 30 Minutes	CHEMISTRY	(PART-B)	11 to 20	+1	0	
	MATHEMATICS	(PART-C)	21 to 30	+1	0	
	PHYSICS	(PART-A)	31 to 40	+5	-1	
SECTION – II (CUET) Time Allotted: 30 Minutes	CHEMISTRY	(PART-B)	41 to 50	+5	-1	
	MATHEMATICS	(PART-C)	51 to 60	+5	Wrong answer 0 0 0 -1 -1 -1 -1 -1 -1 -1 -1 -1	
	PHYSICS	(PART-A)	61 to 65	+4	-1	
SECTION – III (JEE Main) Time Allotted: 30 Minutes	CHEMISTRY	(PART-B)	66 to 70	+4	-1	
	MATHEMATICS	(PART-C)	71 to 75	+4	-1	

Section – I

Time: 30 Minutes

PHYSICS - (PART - A)

This part contains **10 Multiple Choice Questions** number **1 to 10**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.



- 8. The blue colour of the sky is due to the phenomenon of
 (A) scattering
 (B) dispersion
 (C) reflection
 (D) refraction
- 9. In the network of resistors shown in the adjoining figure, the equivalent resistance between *A* and *B* is



- (B) 18 ohm (D) 9 ohm
- 10. The light reflected by a plane mirror may form a real image
 - (A) If the rays incident on the mirror are diverging
 - (B) If the rays incident on the mirror are converging
 - (C) If the object is placed very close to the mirror
 - (D) Under no circumstances

CHEMISTRY – (PART – B)

This part contains **10 Multiple Choice Questions** number **11 to 20.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

11.	Which of the following (A) Fluorine	non-metals sublimes on (B) Chlorine	heating? (C) Bromine	(D) lodine
12.	Acid rain is caused du (A) CO_2, O_2, SO_2 (C) SO_2, N_2, O_2	ue to	(B) CO_2, NO_2, H_2 (D) CO_2, SO_2, NO_2	
13.	Which of the following (A) CH_4 (C) C_2H_6	will undergo addition rea	iction? (B) C ₃ H ₈ (D) C ₂ H ₄	
14.	 Which of the following statement is false? (A) China rose is natural indicator (B) Repeated cultivation by farmers makes soil acidic (C) Ant or bee sting contains acetic acid (D) Majority of factories waste are acidic in nature 			
15.	Baking powder is (A) a mixture (C) an element		(B) a compound (D) a salt	
16.	Which of the following (A) Blue vitriol (C) Washing soda	g is not a hydrated salt?	(B) Baking soda (D) Epsom salt	
17.	Reducing agent in ther (A) Mg (C) Cr	mite process is	(B) Al (D) Fe	

- 18. Which of the following pair will give displacement reaction?
 (A) NaCl solution and copper metal
 (B) MgCl₂
 (C) FeSO₄ solution and silver metal
 (D) AgNO₂
 - (B) MgCl₂ solution and Aluminium metal
 - (D) AgNO₃ solution and copper metal

- 19. Phenolphthalein is
 - (A) yellow in acidic medium pink in basic medium
 - (B) pink in acidic medium, colourless in basic medium
 - (C) colourless in acidic medium, pink in basic medium
 - (D) pink in acidic medium, yellow in basic medium
- 20. A soap molecules has a
 - (A) hydrophobic head and hydrophobic tail
 - (B) hydrophobic head and hydrophilic tail
 - (C) hydrophilic head and hydrophilic tail
 - (D) hydrophilic head and hydrophobic tail

MATHEMATICS - (PART - C)

This part contains **10 Multiple Choice Questions** number **21 to 30.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

21.	Which of the following straight lines passes through (A) $x + y = 4$ (C) $x + y = 5$	ugh the origin? (B) $x^2 + y^2 = -16$ (D) $x = 4y$
22.	For what value of k the quadratic equation $12x^{2}$ (A) 4 (C) -4	+ 4kx + 3 = 0 has equal zeroes. (B) ±5 (D) ±3
23.	The largest number that will divide 398,436 and	542 leaving remainders 7, 11 and 15 respectively
	(A) 17 (C) 34	(B) 11 (D) 45
24.	If one of the zeroes of the cubic polynomial x^3 + two zeroes is (A) b - a + 1 (C) a - b + 1	$ax^{2} + bx + c$ is -1, then the product of the other (B) $b - a - 1$ (D) $a - b - 1$
25.	A vertical stick 20 m long casts a shadow 10 m l casts a shadow 50 m long on the ground, the he (A) 100 m (C) 25 m	ong on the ground at the same time, a tower eight of the tower is (B) 120 m (D) 200 m
26.	The slope of $2x + 3y + 4 = 0$ is	
	(A) $-\frac{3}{2}$	(B) $-\frac{2}{3}$
	(C) $\frac{2}{3}$	(D) $\frac{3}{2}$

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- 27. If -4 is a root of the quadratic equation $x^2 + px 4 = 0$ and the quadratic equation $x^2 + px + k = 0$ has equal roots, then the value of k is
 - (A) 3 (B) $\frac{4}{9}$ (C) $\frac{7}{9}$ (D) $\frac{9}{4}$
- 28. If the sum of the series 2+ 5+ 8+11 is 60100, then the numbers of terms are (A) 100 (B) 200 (C) 150 (D) 250
- 29. If the roots of the equation $x^3 12x^2 + 39x 28 = 0$ are in A.P., then their common difference will be (A) ± 1 (B) ± 2
 - $(C) \pm 3$ $(D) \pm 4$
- 30. In the given figure, DE || BC. If AD = 3 cm, AB = 7 cm and EC = 3 cm, then the length of AE is



Section – II

Time: 30 Minutes

PHYSICS - (PART - A)

This part contains **10 Multiple Choice Questions** number **31 to 40**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

- 31. What is the value of θ in the following diagram?
 - (A) 30°
 - (B) 45°
 - (C) 90°
 - (D) 60°



- 32. If an incident ray passes through the centre of curvature of a spherical mirror, the reflected ray will
 - (A) Pass through the pole
 - (C) Retrace its path

- (B) Pass through the focus
- (D) both (A) and (B) are correct

30

- 33. The combination of a convex lens of focal length 6 cm and a concave lens of focal length f acts as a convex lens of focal length 8 cm. The value of f is
 (A) 12 cm
 (B) 15 cm
 (C) 24 cm
 (D) 3 cm
- An air bubble in a glass slab of refractive index 1.5 is 5 cm deep when viewed from one face and 2 cm deep when viewed from the opposite face. The thickness of the slab is
 (A) 10.5 cm
 (B) 7 cm
 - (C) 10 cm (D) 7.5 cm
- 35. A person cannot see an object lying beyond 10 metres. The power of lens used to rectify this defect will be

(A)	+ 0.1 D	(B) + 0.2 D
 (C)	– 0.2 D	(D) – 0.1 D

36. A convex lens and a concave lens, each having same focal length of 25 cm, are put in contact to form a combination of lenses. The power in diopters of the combination is

(A) zero	(B) 25
(C) 50	(D) infinite

37.	The critical angle for diamond (refract	ive index = 2) is
	(A) About 20°	(B) 60°
	(C) 45°	(D) 30°

- 38. Value of R_{eq} across A and B 16Ω ww (A) 8 Ω 10Ω 10Ω (B) 10 Ω Ŵ ww (C) 18 Ω 10Ω (D) 24 Ω ww 10Ω 10Ω 10Ω ~~~ ww E 39. The total current supplied to the circuit by the battery is (A) 1 A 2Ω (B) 2 A 6Ω 3Ω (C) 4 A (D) 6 A 1 50 - 1A 40. The figure here shows a portion of a circuit. What are the magnitude of the current *i* in the lower right-hand wire 2A(A) 7 A (B) 8 A (C) 6 A 4À ЗA (D) 2 A CHEMISTRY - (PART - B) This part contains 10 Multiple Choice Questions number 41 to 50. Each question has 4 choices (A), (B), (C) and (D), out of which ONLY ONE is correct. 41. During roasting which of the following poisonous gas is mainly produced (A) CO $(B) CO_2$ $(C) SO_2$ $(D) N_2O$ 42. Which species contain coordinate, covalent as well as ionic bonds? (A) H_2SO_4 (B) NH_4NO_3 (C) NaOCI (D) K_2CrO_4 43. In the following reactions, ZnO is respectively acting as a/an
 - (i) $ZnO + Na_2O \rightarrow Na_2ZnO_2$ (ii) $ZnO + CO_2 \rightarrow ZnCO_3$ (A) base and acid (C) acid and acid (B) base and base (D) acid and base
- 44. The aqueous solution of disodium hydrogen phosphate is (A) Acidic (B) Neutral (C) Basic (D) None
- 45. Isomerism exhibit by acetic acid and methyl formate is (A) Functional (B) Chain (C) Geometrical (D) Central
- 46. Which of the following statement is false regarding metals?
 - (A) All metals are solid in nature
 - (B) Metals can be used to make cooking utensils
 - (C) Generally most of metals having high melting and boiling points
 - (D) Copper is used generally to make electrical wires

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- 47. Which of the following is acid salt(s)
 (i) Sodium bisulphite
 (iii) potassium bisulphite
 (A) (i), (ii) & (iv)
 (C) (i), (ii) & (iii)
- (ii) potassium chloride(iv) Sodium carbonate(B) (ii) & (iv)
- (D) (i) & (iii)
- 48. Two test tubes A & B contain aqueous solutions of potassium iodide and lead nitrate separately. When these two test-tubes A & B are mixed to each other, results into x & y. The x & y are :
 (A) yellow ppt., yellow solution
 (B) yellow ppt., Colourless solution
 (C) white ppt., yellow solution
 (D) white ppt., Colourless solution
- 49. Which of the following reaction is endothermic? (A) $C + O_2 \rightarrow CO_2$ (C) $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$

- (B) $CaCO_3 \rightarrow CaO + CO_2$
- (D) $CaO + H_2O \rightarrow Ca(OH)_2$
- 50. An element X on exposure to moist air turns reddish brown and a new compound Y is formed substance X and Y are
 - (A) X = Ag, $Y = Ag_2S$
 - (C) X = AI, $Y = AI_2O_3$

(B) X = Cu, $Y = Cu_2O$ (D) X = Fe, $Y = Fe_2O_3.xH_2O$

MATHEMATICS - (PART - C)

This part contains **10 Multiple Choice Questions** number **51 to 60.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

51.	If $a = \sqrt{11} + \sqrt{3}$, $b = \sqrt{12} + \sqrt{2}$ and $c = \sqrt{6} + \sqrt{4}$, t (A) $c > a > b$ (C) $a > c > b$	hen which of the following holds true? (B) a > b > c (D) b > a > c
52.	Four bells toll at intervals of 10 seconds, 15 seconds they toll together at 10:00 am, at what time will t (A) 10:01 am (C) 10:00:30 am	onds, 20 seconds and 30 seconds respectively. If hey toll together for the first time after 10 am ? (B) 10:02 am (D) 10:00:45 am
53.	In how many ways can 1500 be resolved into tw (A) 18 (C) 24	o factors? (B) 12 (D) 36
54.	If $\frac{\sin^2 \theta - 5 \sin \theta + 3}{\cos^2 \theta} = 1$, then θ can be (A) 30° (C) 60°	(B) 45° (D) 0°
55.	In the given figure, $\overrightarrow{\text{DE}} \parallel \overrightarrow{\text{AC}}$. Find the value of x (A) 1 (C) 3	, (B) 2 (D) 4
56.	If LCM of $f(x)$ and $g(x)$ is $6x^2 + 13x + 6$, then whi g(x)? (A) $2x + 3$ (C) $(2x + 3)(3x + 2)$	ch of the following cannot be the HCF of f(x) and (B) 3x + 1 (D) 3x + 2

- 57. If $\sqrt[3]{75} = \sqrt[9]{45} = \sqrt[3]{15} = 0$, then which of the statement is true : (A) x + y = 2z (B) x + y = 3z(C) x - y = 2z (D) x - y = 3z
- 58. In the figure below (not to scale), $\overline{AB} \perp \overline{CD}$ AD is the bisector of $\angle BAE$. AB = 3 cm and AC = 5 cm. Find CD.



Section – III

Time: 30 Minutes

PHYSICS - (PART - A)

This part contains **TWO** (02) comprehensions. Based on each comprehension, there are **THREE** (03) questions in Comprehension-1 & **TWO** (02) questions in Comprehension-2 of **Multiple Choice Questions**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.



CHEMISTRY - (PART - B)

This part contains **TWO (02)** comprehensions. Based on each comprehension, there are **THREE** (03) questions in Comprehension-1 & **TWO (02)** questions in Comprehension-2 of **Multiple Choice Questions**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

Comprehension-1 for Q. No. 66 to 68

A homologous series is a collection of compounds with the same general formula that differ only in the carbon chain length. Compounds in a homologous series have same functional groups, resulting in chemical and physical properties that are comparable. The homologous series of straight-chained alkanes begins methane (CH₄), ethane (C₂H₆), propane (C₃H₈), butane (C₄H₁₀), and pentane (C₅H₁₂). 66. Which of the following is not observed in a homologous series? (A) Change in chemical properties (B) Difference in -CH₂ and 14u molecular mass (C) Gradation in physical properties (D) Same functional group 67. Which group of compounds is part of a homologous series? (A) CH_4 , C_2H_4 , C_3H_8 (B) C_3H_6 , C_3H_8 , C_3H_7OH (C) CH_3OH , C_2H_5OH , C_3H_7OH (D) CH₃CO₂H, CH₃CH₂OH, HCO₂H 68. C₅H₁₂ belongs to the homologous series of (A) Alkynes (B) Alkenes (C) Alkanes (D) Cyclo alkanes Comprehension-2 for Q. No. 69 to 70 An oxidizing agent (often referred to as an oxidant) is a chemical species that tends to oxidize other substances. A substance which loses electrons to other substances in a redox reaction and gets oxidised to a higher valency state is called a reducing agent. A redox equation can be balanced using the following stepwise procedure: (1) Divide the equation into two half-reactions. (2) Balance each half-reaction for number of atoms and charge. (3) Equalize the number of electrons transferred in each half-reaction. (4) Add the half-reactions together What is the value of x in given equation? 69. $yAI + xH^+ \rightarrow yAI^{3+} + zH_2$ (A) 2 (B) 4 (C) 6 (D) 8 70. What is the ratio of coefficients reducing agent to oxidizing agent, if the following reaction is correcting balanced? $NH_1 + O_2 \rightarrow NO + H_2O$

$111_3 + 0_2 \rightarrow 100 + 11_20$	
(A) 4:5	(B) 5:4
(C) 5:3	(D) 3:5

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MATHEMATICS - (PART - C)

This part contains **TWO (02)** comprehensions. Based on each comprehension, there are **THREE (03)** questions in Comprehension-1 & **TWO (02)** questions in Comprehension-2 of **Multiple Choice Questions**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

Comprehension-1 for Q. No. 71 to 73

In the adjoining figure, I and II are circles with centre P and Q respectively. The two circles touch each other and have a common tangent that touches them at point R and S respectively. This common tangent meet the line joining P and Q at O. The diameters of I and II are in the ratio 4:3. It is known that the length of PO is 28 cm.





360° DIAGNOSTIC & SCHOLARSHIP EXAM

Sample Paper

for Students presently in Class X

Paper 2 Basic School, CUET, JEE Main

ANSWER KEY

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