

**SAMPLE QUESTION PAPER**

**INSTITUTE NAME & LOGO**

**JEE-MAIN EXAM YEAR**

**Chem : Full Portion Paper**

Test Number	Test Booklet No.
Write/Check this Code on your Answer Sheet	Write this number on your Answer Sheet
<p align="center"><b>: IMPORTANT INSTRUCTIONS :</b></p> <p>02. Immediately fill in the particulars on this page of the Test Booklet with <b>Blue/Black Ball point Pen</b>. Use of pencil is strictly prohibited</p> <p>03. The Answer Sheet is kept inside this Test Booklet. When you are directed to open the Test Booklet, take out the Answer Sheet and fill in the particulars carefully.</p> <p>04. The test is of <b>60 Min.</b> duration</p> <p>05. The Test Booklet consists of <b>25</b> questions. The maximum marks are <b>100</b>. All the Ques. consists of <b>FOUR (4)</b> marks each.</p> <p>06. <b>Chemistry 25 Ques. (100 Marks)</b></p> <p>07. Candidates will be awarded marks as stated above in Instruction No.5 for correct response of each question. <b>ONE (1)</b> marks will be deducted for indicating incorrect response of each question. <b>No deduction</b> from the total score will be made <b>if no response</b> is indicated for an item in the Answer Sheet.</p> <p>08. Use <b>Blue/Black Ball Point Pen only</b> for writing particulars/markings responses on <b>Side-1</b> and <b>Side-2</b> of the Answer Sheet. <b>Use of pencil is strictly prohibited.</b></p> <p>09. No candidate is allowed to carry any textual material, printed or written, bits of papers, pager, mobile phone, any electronic device, etc., except the Admit Card inside the examination hall/room.</p> <p>10. Rough work is to be done on the space provided for this purpose in the Test Booklet only. This space is given at the bottom of each page of the booklet.</p> <p>11. On completion of the test, the candidate must hand over the Answer Sheet to the Invigilator on duty in the Room/Hall. <b>However, the candidates are allowed to take away this Test Booklet with them.</b></p> <p>12. The CODE for this Booklet is A. Make Sure that the CODE printed on <b>Side-2</b> of the Answer Sheet is the same as that on this booklet. In case of discrepancy, the candidate should immediately report the matter to the Invigilator for replacement of both the Test Booklet and the Answer Sheet.</p> <p>13. Do not fold or make any stray marks on the Answer Sheet.</p> <p>14. No part of the Test Booklet and Answer Sheet shall be detached under any circumstances.</p>	

Name of the Candidate : \_\_\_\_\_

Roll Number : In figures :

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In words : \_\_\_\_\_

Examination Centre Number :

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Name of Examination Centre (in Capital letters) : \_\_\_\_\_

Candidate's Signature : \_\_\_\_\_

Invigilator's Signature : \_\_\_\_\_

## SAMPLE QUESTION PAPER

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### JEE-MAIN EXAM YEAR

Time : 60 Min

Chem : Full Portion Paper

Marks : 100

26) All reactions which have chemical disintegration

- 1) is reversible or irreversible and endothermic or exothermic.
- 2) is exothermic.
- 3) is reversible and endothermic.
- 4) is reversible.

27) A mixture of camphor and benzoic acid can be separated by

- 1) sublimation.
- 2) chemical method.
- 3) fractional distillation.
- 4) extraction with a solvent.

28) In aqueous solution, strong electrolytes

- 1) form polymers
- 2) are partially ionized.
- 3) do not ionize.
- 4) ionize almost completely.

29) Important ore of zinc is

- 1) malachite.
- 2) gibbsite.
- 3) cryolite.
- 4) calamine.

30) Which has yellow colour?

- 1) Fischer's salt
- 2) Potassium cobaltinitrite
- 3) Potassium hexanitrocobaltate (III)
- 4) All the above

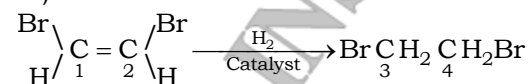
31) Electrolysis of molten sodium chloride leads to the formation of

- 1) Na and  $\text{Cl}_2$
- 2)  $\text{H}_2$  and  $\text{O}_2$
- 3) Na and  $\text{O}_2$
- 4) Na and  $\text{H}_2$

32) Which of the following produces hydrolith with dihydrogen?

- 1) Cu
- 2) Ca
- 3) Mg
- 4) Al

33) In the reaction



The hybridisation states of carbon atoms 1, 2, 3, 4 are

- 1) 1 and 2  $\text{sp}^2$ ; 3 and 4  $\text{sp}$
- 2) 1 and 2  $\text{sp}^2$ ; 3 and 4  $\text{sp}^3$
- 3) 1, 2, 3 and 4  $\text{sp}$
- 4) 1, 2  $\text{sp}^3$ ; 3, 4  $\text{sp}^2$

34) Among the following pairs of ions, the lower oxidation state in aqueous solution is more stable than the other in

1)  $\text{V}^{2+}$ ,  $\text{VO}^{2+}$

2)  $\text{Cr}^{2+}$ ,  $\text{Cr}^{3+}$

3)  $\text{Cu}^+$ ,  $\text{Cu}^{2+}$

4)  $\text{Tl}^+$ ,  $\text{Tl}^{3+}$

35) In neutralization of KI by  $\text{AgNO}_3$  positive charge is due to absorption of

- 1) Ag
- 2)  $\text{Ag}^+$  ions
- 3) I ions
- 4) Both (2) and (3)

36) The extent of ionization increases

- 1) on stirring the solution vigorously.
- 2) on decreasing the temperature of solution.
- 3) on addition of excess water to solution.
- 4) with the increase in concentration of solute.

37) Which of the following pairs has both members from the same group of the periodic table?

- 1) Mg – K
- 2) Mg – Cu
- 3) Mg – Na
- 4) Mg – Ba

38) In the reaction  $2\text{A} + \text{B} \rightarrow \text{A}_2\text{B}$ , if the concentration of A is doubled and of B is halved, then the rate of the reaction will

- 1) increase by two times.
- 2) increase by four times.
- 3) decrease by two times.
- 4) remain the same.

39) The statement "If 0.003 moles of a gas are dissolved in 900 g of water under a pressure of 1 atmosphere, 0.006 moles will be dissolved under a pressure of 2 atmospheres", illustrates

- 1) Henry's law.
- 2) Raoult's law.
- 3) Graham's law.
- 4) Dalton's law of partial pressure.

40) What are the shapes of  $\text{BF}_3$  and  $[\text{BH}_4]^-$ ?

- 1) Planar, tetrahedral
- 2) Planar, planar
- 3) Tetrahedral, planar
- 4) Tetrahedral, tetrahedral

41) Nitroglycerine is

- 1) an acid.
- 2) a nitro compound.
- 3) an alcohol.
- 4) an ester.

42) Which of the following serves as an indicator of atmospheric pollution

- 1) Epiphytic lichens
- 2) Hornworts
- 3) Liverworts
- 4) Ferns

43) Which one of the following has the minimum boiling point?

- 1) Isobutane
- 2) n-Butane
- 3) 1-Butyne
- 4) 1-Butene

44) The compound which contains all the four  $1^\circ$ ,  $2^\circ$ ,  $3^\circ$  and  $4^\circ$  carbon atoms is

- 1) 3-chloro-2, 3-dimethylpentane.
- 2) 2, 3-dimethyl pentane.
- 3) 2, 3, 4-trimethylpentane.
- 4) 3, 3-dimethylpentane.

45) Which of the following is redox reaction?

- 1) Nitrogen oxides form nitrogen and oxygen by lightning.
- 2) Evaporation of  $H_2O$ .
- 3) In atmosphere,  $O_3$  from  $O_2$  by lightning.
- 4)  $H_2SO_4$  with NaOH.

46) Estimate the work function( in eV) of the metal,

if the light of wavelength  $4000 \text{ \AA}$  generates photoelectron of velocity  $6 \times 10^5 \text{ ms}^{-1}$  from it. (Mass of electron =  $9 \times 10^{-31} \text{ kg}$ , Velocity of light =  $3 \times 10^8 \text{ ms}^{-1}$ , Planck's constant =  $6.626 \times 10^{-34} \text{ Js}$ , Charge of electron =  $1.6 \times 10^{-19} \text{ JeV}^{-1}$ )

47) Among the triatomic molecules/ions,  $BeCl_2$ ,  $N_3^-$ ,  $N_2O$ ,  $NO_2^+$ ,  $O_3$ ,  $SCl_2$ ,  $ICl_2^-$ ,  $I_3^-$  and  $XeF_2$ , estimate the total number of linear molecules(s)/ion(s) where the hybridization of the central atom does not have contribution from the d-orbital(s). [Atomic number: S = 16, Cl = 17, I = 53 and Xe = 54]

48) The heats of combustion of carbon and carbon monoxide are  $-393.5$  and  $-283.5 \text{ kJ mol}^{-1}$ , respectively. What is the heat of formation (in kJ) of carbon monoxide per mole?

49) Consider an ionic solid MX with NaCl structure. Construct a new structure (Z) whose unit cell is constructed from the unit cell of MX following the sequential instruction given below. Neglect the charge balance.

- (a) Remove all the anions (X) except the central one
- (b) Replace all the face centered cations (M) by anions (X)
- (c) Remove all the corner cations (M)
- (d) Replace the central anion (X) with cation (M)

What is the value of  $\left( \frac{\text{Number of anions}}{\text{Number of cations}} \right)$  in Z ?

50) A compound  $H_2X$  with molar weight of 80 g is dissolved in a solvent having density of  $0.4 \text{ g mL}^{-1}$ . Assuming no change in volume upon dissolution, estimate the molality of a 3.2 molar solution.