

CH4

Test Booklet Series

0

Question Booklet Number
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Do not open this test booklet until you are asked to do so.

Please read the instructions given below carefully and follow them.

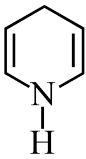
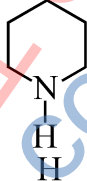
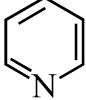
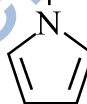
Number of Pages in Booklet
16
No. of Questions in Booklet
100
Maximum Marks
100
Time **2** Hours

INSTRUCTIONS

1. IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS TEST BOOKLET DOES **NOT** HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR ITEMS, ETC. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET.
2. Please note that it is the candidate's responsibility to encode and darken the **ROLL NUMBER, TEST BOOKLET SERIES** Code A, B, C or D and Question Booklet Number carefully and without any omission or discrepancy at the appropriate places in the OMR Answer Sheet. **Any omission/ discrepancy will render the OMR Answer Sheet liable for rejection.**
3. You have to enter your Roll Number on the Test Booklet in the Box provided below. **DO NOT** write **anything else** on the Test Booklet.

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4. This Test Booklet contains 100 items (questions). Each item shall have five options (A, B, C, D, and E). If a candidate is attempting a question, he has to darken most appropriate circle from A, B, C or D. However if you are not attempting a question then you have to darken the circle 'E'. If none of the five circle is darkened, one-fourth (0.25) marks shall be deducted.
5. **Any candidate not darkening any of the five circles in more than 10% question shall be disqualified.**
6. **All questions are compulsory. Each question carry one mark. For each wrong Answer, one fourth (0.25) mark shall be deducted.**
7. You have to mark all your responses **ONLY** on the separate OMR Answer Sheet provided. See directions in the OMR Answer Sheet. Use only **BLUE/BLACK Ball Point Pen** to answer in OMR Answer Sheet.
8. Before you proceed to mark in the OMR Answer Sheet the response to various items in the Test Booklet, you have to fill in some particulars in the OMR Answer Sheet as per instructions mentioned on the OMR Answer Sheet.
9. At the end of the examination you should handover to the invigilator the original copy and office copy of the OMR Sheet. You are permitted to take away with you the Question Booklet along with candidate's copy of the OMR Sheet.
10. Sheets for rough work are appended in the Test Booklet at the end.

- 1 Which of the following is an intensive property?
(A) Temperature (B) Surface tension
(C) Viscosity (D) All of these
(E) Question not attempted
- 2 Coordination numbers of Zn^{2+} and S^{2-} in the crystal structure of Wurtzite are :
(A) 4, 4 (B) 6, 6
(C) 8, 4 (D) 8, 8
(E) Question not attempted
- 3 If the electronic structure of oxygen atom is written as $1s^2 2s^2 2p^4$, it would violate :
(A) Hund's rule (B) Pauli's exclusion principle
(C) Both Hund's and Pauli's principles (D) None of the rules is violated
(E) Question not attempted
- 4 Which one of the following inorganic constituents is present in chlorophyll?
(A) Mg (B) Cr
(C) Zn (D) Fe
(E) Question not attempted
- 5 The units of cell constant are :
(A) $ohm^{-1}cm^{-1}$ (B) cm
(C) $ohm^{-1}cm$ (D) cm^{-1}
(E) Question not attempted
- 6 XeF_2 is iso-structural with which one of the following?
(A) ICl_2^- (B) $SbCl_3$
(C) $BaCl_2$ (D) TeF_2
(E) Question not attempted
- 7 Nylon 66 belongs to :
(A) Addition polymer (B) Condensation polymer
(C) Addition homopolymer (D) Condensation heteropolymer
(E) Question not attempted
- 8 Which of the following is coloured due to d-d transition?
(A) MnO_4^- (B) $Cr_2O_7^{2-}$
(C) Fe^{3+} (D) Zn^{2+}
(E) Question not attempted
- 9 Which law of Thermodynamics introduces the concept of entropy?
(A) First law (B) Second law
(C) Third law (D) Zeroth law
(E) Question not attempted
- 10 Indicator used in the titration of acidified $KMnO_4$ with ferrous sulphate is:
(A) Phenolphthalein (B) Methyl orange
(C) Starch (D) No Indicator
(E) Question not attempted

- 11 Which of the following may be separated by ordinary physical methods?
 (A) A pair of identical molecules (B) A pair of enantiomers
 (C) A pair of diastereomers (D) A pair of identical atoms
 (E) Question not attempted
- 12 Which compound has the highest melting point?
 (A) Decane (B) 2,2,3,3-tetramethylbutane
 (C) 2,2,3-trimethylpentane (D) 4-methylnonane
 (E) Question not attempted
- 13 Which of the following will not convert 1-butanol into 1-chlorobutane in one step?
 (A) SOCl_2 (B) PCl_3
 (C) HCl (D) CCl_4
 (E) Question not attempted
- 14 Which of the following amines is pyridine?
 (A)  (B) 
 (C)  (D) 
 (E) Question not attempted
- 15 Which of the following compounds does not undergo mutarotation?
 (A) Glucose (B) Sucrose
 (C) Ribose (D) Fructose
 (E) Question not attempted
- 16 Which transitions are studied by a UV spectrophotometer?
 (A) Electronic (B) Vibrational
 (C) Nuclear (D) Rotational
 (E) Question not attempted
- 17 The process of heating the concentrated ore in a limited supply of air or in absence of air is known as :
 (A) Roasting (B) Calcination
 (C) Cupellation (D) Leaching
 (E) Question not attempted
- 18 Percentage of gold in 18 carat gold is :
 (A) 18 (B) 100
 (C) 75 (D) 83.6
 (E) Question not attempted

- 19 Which of the following is correct ?
- (A) $\left(\frac{\partial S}{\partial P}\right)_T = \left(\frac{\partial V}{\partial T}\right)_P$ (B) $\left(\frac{\partial S}{\partial V}\right)_T = -\left(\frac{\partial P}{\partial T}\right)_V$
 (C) $\left(\frac{\partial H}{\partial P}\right)_T = T\left(\frac{\partial V}{\partial T}\right)_P - V$ (D) $\left(\frac{\partial U}{\partial V}\right)_T = T\left(\frac{\partial P}{\partial T}\right)_V - P$
 (E) Question not attempted
- 20 The number of P-O-P bonds in P_4O_{10} is :
- (A) 2 (B) 3
 (C) 4 (D) 6
 (E) Question not attempted
- 21 The covalent radius of Li is 123 pm. The crystal radius of Li will be :
- (A) $123/2$ pm (B) < 123 pm
 (C) $=123$ pm (D) > 123 pm
 (E) Question not attempted
- 22 The compressibility factor for ideal gas is :
- (A) 1 (B) > 1
 (C) Zero (D) < 1
 (E) Question not attempted
- 23 Which of the following is not a colligative property?
- (A) Osmotic pressure (B) Relative increase in vapour pressure
 (C) Depression of freezing point (D) Elevation of boiling point
 (E) Question not attempted
- 24 Preparation of Lyophobic sols by chemical method does NOT involve :
- (A) Double decomposition (B) Oxidation and reduction
 (C) Hydrolysis (D) Combination reaction
 (E) Question not attempted
- 25 Which of the following is an example of Zinc ore?
- (A) Magnetite (B) Malachite
 (C) Cryolite (D) Willemite
 (E) Question not attempted
- 26 When XeF_6 reacts with silica or glass, it gives a colourless liquid of the following composition?
- (A) $Si_2XeO_2F_6$ (B) XeO_3
 (C) XeO_4F_2 (D) $XeOF_4$
 (E) Question not attempted
- 27 2-Acetoxy benzoic acid is known as :
- (A) Aspirin (B) Paracetamol
 (C) Ibuprofen (D) Wintergreen oil
 (E) Question not attempted
- 28 The temperature – dependence of an electrochemical cell potential is :
- (A) $\Delta G/nFT$ (B) $\Delta H/nF$
 (C) $\Delta S/nF$ (D) $\Delta S/nFT$
 (E) Question not attempted

29 The half-life period of a first order chemical reaction is 6.93 minutes. The time required for the completion of 99% of the chemical reaction will be ($\log 2 = 0.301$) :

- (A) 46.06 minutes (B) 230.3 minutes
(C) 23.03 minutes (D) 460.6 minutes
(E) Question not attempted

30 If a system is at equilibrium, the rate of forward to reverse reaction is :

- (A) Equal (B) Less
(C) High (D) At Equilibrium
(E) Question not attempted

31 Oxidation number of N in HNO_3 is :

- (A) +5 (B) +3.5
(C) -3.5 (D) -5
(E) Question not attempted

32 Total orbital angular momentum of np^6 electronic system is (a.u.) :

- (A) 0 (B) $\frac{1}{2}$
(C) 2 (D) 1
(E) Question not attempted

33 Arrange the following in decreasing order of their acidity :



- (A) (iv) > (ii) > (i) > (iii) (B) (iv) > (iii) > (ii) > (i)
(C) (i) > (ii) > (iii) > (iv) (D) (i) > (iv) > (iii) > (ii)
(E) Question not attempted

34 The compound that gives precipitate on warming with aqueous AgNO_3 is :



- (E) Question not attempted

35 Which of the following amount of NaOH present in 300 cm^3 of 0.4N solution?

- (A) 4.8g (B) 0.016g
(C) 8g (D) 0.48g
(E) Question not attempted

36 Match the following rules with their statements.

Rule	Statement
a. Heisenberg's uncertainty principle	i. In the ground state of atoms, orbitals are filled in the order of their increasing energies.
b. Hund's rule	ii. No two electrons in an atom can have the same set of four quantum numbers.
c. Aufbau principle	iii. Pairing of electrons in the orbitals belonging to the same subshell does not take place until each orbital is singly occupied.
d. Pauli exclusion principle	iv. It is impossible to determine the exact position and exact momentum of a subatomic particle simultaneously.

Which of the following is correct?

- (A) a-ii, b-iii, c-i, d-iv
(B) a-iv, b-i, c-iii, d-ii
(C) a-iv, b-iii, c-i, d-ii
(D) a-i, b-iv, c-iii, d-ii
(E) Question not attempted

37 Which of the following is applicable for Ostwald's dilution law?

- (A) Non-electrolytes
(B) Weak electrolytes only
(C) Strong electrolytes only
(D) Strong and weak electrolytes
(E) Question not attempted

38 Which of the following is a Lewis base?

- (A) AlCl_3
(B) $\text{Al}(\text{OH})_3$
(C) NH_3
(D) Ag^+
(E) Question not attempted

39 Milk is an example for which of the following colloids?

- (A) Gel
(B) Sol
(C) Emulsion
(D) Aerosol
(E) Question not attempted

40 Which of the following reason, a finely divided substance more effective as an adsorbent?

- (A) Large surface area
(B) Small surface area
(C) Strong molecular bonding
(D) Weak molecular bonding
(E) Question not attempted

41 Decomposition of HI on surface of gold into H_2 and I_2 is an example for which of the following order of a reaction?

- (A) First
(B) Second
(C) Fractional
(D) Zero
(E) Question not attempted

42 Which of the following is NOT an example of redox reaction?

- (A) $\text{CuO} + \text{H}_2 \rightarrow \text{Cu} + \text{H}_2\text{O}$
(B) $\text{Fe}_2\text{O}_3 + 3\text{CO} \rightarrow 2\text{Fe} + 3\text{CO}_2$
(C) $2\text{K} + \text{F}_2 \rightarrow 2\text{KF}$
(D) $\text{BaCl}_2 + \text{H}_2\text{SO}_4 \rightarrow \text{BaSO}_4 + 2\text{HCl}$
(E) Question not attempted

43 Which of the following has highest freezing point?

- (A) 0.1 M BaCl_2
(B) 0.1 M $\text{Al}_2(\text{SO}_4)_3$
(C) 0.1 M NaCl
(D) 0.1 M urea
(E) Question not attempted

- 44 Assertion (A) : Among the two O–H bonds in H₂O molecule, the energy required to break the first O–H bond and the second O–H bond is the same.
Reason(R) : This is because the electronic environment around oxygen is the same even after breakage of one O–H bond.
Choose the correct option out of the following :
- (A) Both (A) and (R) are true and (R) is correct explanation of (A)
(B) Both (A) and (R) are true but (R) is not correct explanation of (A)
(C) Both (A) and (R) are false
(D) (A) is false but (R) is true
(E) Question not attempted
- 45 Which of the following molecule has zero dipole moment?
- (A) NH₃ (B) CO₂
(C) H₂O (D) H₂S
(E) Question not attempted
- 46 Which of the following statement is correct?
- (A) Entropy of the universe is continuously increasing
(B) Entropy of the universe is remains constant
(C) Entropy of the universe is zero
(D) Entropy of the universe is continuously decreasing
(E) Question not attempted
- 47 Which of the following element shows maximum oxidation state?
- (A) Mn (B) Fe
(C) Co (D) Cu
(E) Question not attempted
- 48 Which of the following is radioactive in nature?
- (A) Protium (B) Deuterium
(C) Hydronium (D) Tritium
(E) Question not attempted
- 49 Which of the following is called magnetite?
- (A) FeCO₃ (B) Fe₂O₃
(C) Fe₂O₃ · 3H₂O (D) Fe₃O₄
(E) Question not attempted
- 50 A solid (X) reacts with strong aqueous solution of NaOH, liberating a foul smelling gas(B), which spontaneously burns in the air, giving smoky rings. Which of the following A and B are respectively?
- (A) P₄(red) and PH₃ (B) P₄ (white) and H₂S
(C) P₄(white) and PH₃ (D) S₈ and H₂S
(E) Question not attempted
- 51 Which of the following family group is called chalcogens?
- (A) Boron (B) Carbon
(C) Nitrogen (D) Oxygen
(E) Question not attempted

- 52 In the preparation of compounds of Xe, Bartlett had taken $O_2 + PtF_6^-$ as a base compound because :
- (A) Both O_2 and Xe have same electron gain enthalpy.
 (B) Both O_2 and Xe have same size.
 (C) Both O_2 and Xe have almost same ionization enthalpy.
 (D) Both Xe and O_2 are gases.
 (E) Question not attempted
- 53 Choose the correct magnetic moment of Cu in $[Cu(NH_3)_4]SO_4$.
- (A) 1.73 BM (B) 2.82 BM
 (C) 3.87 BM (D) 0 BM
 (E) Question not attempted
- 54 Which of the following compound is used in treatment of cancer?
- (A) Cis-platin (B) Trans-platin
 (C) Zeise's salt (D) Ferrocene
 (E) Question not attempted
- 55 Which of the following, n-butane exist in stable conformation?
- (A) Eclipsed (B) Fully eclipsed
 (C) Gauche (D) Anti
 (E) Question not attempted
- 56 Assertion(A) : The pH of acid rain is less than 5.6.
 Reason(R) : Carbon dioxide present in the atmosphere dissolves in rain water and forms carbonic acid.
 Choose the correct option out of the following.
- (A) Both (A) and (R) are true and (R) is correct explanation of (A)
 (B) Both (A) and (R) are true but (R) is not correct explanation of (A)
 (C) Both (A) and (R) are false
 (D) (A) is false but (R) is true
 (E) Question not attempted
- 57 Match the following column-I with column-II.
- | Column-I | Column-II |
|-----------------------------------|---------------------------------|
| a. Phosphate fertilizers in water | i. BOD level of water increases |
| b. Synthetic detergents in water | ii. Acid rain |
| c. Nitrogen oxides in air | iii. Global warming |
| d. Methane in air | iv. Eutrophication |
- Which of the following is correct?
- (A) a-iv, b-i, c-ii, d-iii (B) a-iii, b-iv, c-ii, d-i
 (C) a-iv, b-ii, c-i, d-iii (D) a-ii, b-iv, c-iii, d-i
 (E) Question not attempted
- 58 Which of the following is correct molecular formula for phosgene?
- (A) $SOCl_2$ (B) $CHCl_3$
 (C) $COCl_2$ (D) PH_3
 (E) Question not attempted
- 59 Which of the following is chemical name of picric acid?
- (A) 2,4,6-Trinitrobenzoic acid (B) 2,4,6-Tribromobenzoic acid
 (C) 2,4,6-Trinitrophenol (D) 2,4,6-Tribromophenol
 (E) Question not attempted

- 60 Choose the correct option of the following order of increasing acidic strength.
 (A) Chloroacetic acid > bromoacetic acid > fluoroacetic acid > iodoacetic acid.
 (B) Fluoroacetic acid > chloroacetic acid > bromoacetic acid > iodoacetic acid.
 (C) Iodoacetic acid > bromoacetic acid > chloroacetic acid > fluoroacetic acid.
 (D) Chloroacetic acid > fluoroacetic acid > iodoacetic acid > bromoacetic acid.
 (E) Question not attempted
- 61 Which of the following correct IUPAC name for $\text{CH}_2=\text{CH}-\text{CH}_2-\text{NH}-\text{CH}_3$?
 (A) Allylmethylamine (B) 2-amino-4-pentene
 (C) 4-aminopent-1-ene (D) N-methylprop-2-ene-1-amine
 (E) Question not attempted
- 62 Which of the following best method for the preparation of 1° amines from alkyl halides without changing the number of carbon atoms in the chain?
 (A) Hoffmann bromamide reaction (B) Sandmeyer reaction
 (C) Gabriel phthalimide synthesis (D) Reaction with ammonia
 (E) Question not attempted
- 63 Which of the following commercial name of polyacrylonitrile?
 (A) Dacron (B) PVC
 (C) Bakelite (D) Orlon
 (E) Question not attempted
- 64 The shape of the molecule XeO_2F_2 is :
 (A) Distorted tetrahedral (B) Square planar
 (C) Trigonal bipyramidal (D) Tetrahedral
 (E) Question not attempted
- 65 $2\text{C}_6\text{H}_5\text{CHO} \xrightarrow{\text{NaOH}} \text{C}_6\text{H}_5\text{CH}_2\text{OH} + \text{C}_6\text{H}_5\text{COONa}$
 The same reaction takes place with which one of the following aldehydes?
 (A) CH_3CHO (B) $\text{CH}_3\text{CH}_2\text{CHO}$
 (C) $(\text{CH}_3)_3\text{CCHO}$ (D) $(\text{CH}_3)_2\text{CHCHO}$
 (E) Question not attempted
- 66 Match the substituent to the stated orientation and activation effects. Which set is incorrect?
 (A) OH^- activating; o- and p- directing
 (B) Me; activating; o- and p- directing
 (C) Cl^- activating; o- and p- directing
 (D) NO_2^- deactivating; m- directing
 (E) Question not attempted
- 67 Consider the SN^1 reaction of tert-butyl chloride with iodide ion :
 $(\text{CH}_3)_3\text{C}-\text{Cl} + \text{I}^- \rightarrow (\text{CH}_3)_3\text{C}-\text{I} + \text{Cl}^-$
 If the concentration of iodide ion is doubled, the rate of forming tert-butyl iodide will :
 (A) Double (B) Decrease
 (C) Increase 4 times (D) Remain the same
 (E) Question not attempted
- 68 In crystal field theory (CFT), the energy gap between t_{2g} and e_g sets is denoted by :
 (A) $8 Dq$ (B) $20 Dq$
 (C) $0 Dq$ (D) $10 Dq$
 (E) Question not attempted

- 69 Which species does not contain an sp^3 -hybridized atom?
 (A) NH_4^+ (B) BH_4^-
 (C) BH_3 (D) NH_3
 (E) Question not attempted
- 70 Which alcohol has the highest boiling point?
 (A) butan-1-ol (B) butan-2-ol
 (C) isobutyl alcohol (D) t-butyl alcohol
 (E) Question not attempted
- 71 Which of the following penta-fluorides does not exist?
 (A) BiF_5 (B) PF_5
 (C) AsF_5 (D) SbF_5
 (E) Question not attempted
- 72 A chemical reaction $X \rightarrow Y$ is a second order reaction. If the concentration of X becomes doubled, then the increase in the rate of formation of Y by a factor of :
 (A) 2 (B) $\frac{1}{2}$
 (C) $\frac{1}{4}$ (D) 4
 (E) Question not attempted
- 73 Which of the following species have intramolecular hydrogen bond?
 (A) Para nitro phenol (B) Ortho nitro phenol
 (C) Phenol (D) Nitro ethane
 (E) Question not attempted
- 74 In the reaction: $NH_4Cl (s) \rightarrow NH_3 (g) + HCl (g)$, what is the entropy ΔS° ?
 (A) Less than zero (B) Equal to zero
 (C) Greater than zero (D) None
 (E) Question not attempted
- 75 Lead in water can cause :
 (A) Eye disease (B) Hair falling
 (C) Arthritis (D) Kidney damage
 (E) Question not attempted
- 76 In biological systems, the metal ions involved in electron transport are :
 (A) Na^+ and K^+ (B) Zn^{+2} and Mg^{+2}
 (C) Ca^{+2} and Mg^{+2} (D) Cu^{+2} and Fe^{+3}
 (E) Question not attempted
- 77 Which one will show optical isomerism?
 (A) $[Co(NH_3)_3Cl_3]$ (B) $cis-[Co(en)_2Cl_2]Cl$
 (C) $trans-[Co(en)_2Cl_2]Cl$ (D) $[Co(NH_3)_4Cl_2]Cl$
 (E) Question not attempted
- 78 The correct set of the biologically essential elements is :
 (A) Fe, Mo, Cu, Zn (B) Fe, Cu, Co, Ru
 (C) Fe, Ru, Zn, Mg (D) Cu, Mn, Zn, Ag
 (E) Question not attempted
- 79 Which of the following will not give test for Cl^- with $AgNO_3 (aq)$ at $25^\circ C$?
 (A) $CoCl_3 \cdot 5NH_3$ (B) $CoCl_3 \cdot 6NH_3$
 (C) $CoCl_3 \cdot 3NH_3$ (D) $CoCl_3 \cdot 4NH_3$
 (E) Question not attempted

- 80 Expected value of dipole moment in Debye units in case of p-dichlorobenzene is :
 (A) Zero (B) One
 (C) Two (D) Six
 (E) Question not attempted
- 81 A partnership firm having P, Q, R and S as partners earns a profit of ₹ 4,16,250 in the year. The share of Q in the business is $\frac{4}{5}$ of P's share, R's share is $\frac{7}{8}$ of Q's share and S's share is $\frac{5}{6}$ of R's share. Then, find the sum of the shares of Q and R in the profits.
 (A) ₹ 1,98,500 (B) ₹ 2,02,500
 (C) ₹ 2,06,000 (D) ₹ 2,07,500
 (E) Question not attempted
- 82 Find the value of $(\sin \theta - \operatorname{cosec} \theta)^2 + (\cos \theta - \sec \theta)^2 - (\tan^2 \theta + \cot^2 \theta) + 2$.
 (A) 1 (B) 2
 (C) 3 (D) 5
 (E) Question not attempted
- 83 Find the value of $\frac{1}{(5 \times 6)} + \frac{1}{(6 \times 7)} + \frac{1}{(7 \times 8)} + \frac{1}{(8 \times 9)} + \dots + \frac{1}{(12 \times 13)}$
 (A) $\frac{8}{65}$ (B) $\frac{7}{60}$
 (C) $\frac{6}{55}$ (D) $\frac{7}{50}$
 (E) Question not attempted
- 84 Sum of the areas of two squares is 832 cm². If the difference of their perimeters is 32 cm, then find the sides of the two squares.
 (A) 22 cm and 14 cm (B) 24 cm and 16 cm
 (C) 26 cm and 18 cm (D) 26 cm and 20 cm
 (E) Question not attempted
- 85 In still water a man can row 21 km in one hour. When the speed of the water current is 3 kmph it takes him $3\frac{1}{2}$ hours to go from point A to point B, and then return to point A. Find the distance from A to B.
 (A) 36 km (B) 39 km
 (C) 42 km (D) 45 km
 (E) Question not attempted

Qs. 86-87 : Each of these questions contains six statements followed by four sets of combinations of three. Choose the set in which the statements are logically related.

- 86**
- a. Some men are bald.
 - b. Bald people are intelligent.
 - c. Raman is a man.
 - d. Raman is bald.
 - e. Raman is intelligent.
 - f. All men are intelligent.
- (A) abf (B) bde
(C) bcd (D) bef
(E) Question not attempted

- 87**
- a. Metal is a good material for desks.
 - b. Desks are made of metal.
 - c. This object is not a desk.
 - d. This object is a desk.
 - e. This object is not made of metal.
 - f. This object is made of metal.
- (A) adf (B) bce
(C) abd (D) bdf
(E) Question not attempted

Qs. 88-90 : Each of these has a question followed by two statements I and II. Mark the answer as:

- (A) if the question can be answered with the help of statement I alone,
- (B) if the question can be answered with the help of statement II alone,
- (C) if both the statements I and II are needed to answer the question, and
- (D) if the question cannot be answered even with the help of both the statements.
- (E) Question not attempted

88 Two types of widgets, viz. Type A and Type B, can be produced on a machine. If the machine is available for 80 hours, then how many widgets of Type A must be produced?

- I. One unit of Type A widget requires 2 machine hours to produce, and one unit of Type B widget requires 4 machine hours.
- II. The widget dealer wants to be supplied with at least 10 units of Type A widget per week and he would not accept less than 15 units of Type B widget.

89 What is the area of a regular hexagon?

- I. The length of the boundary line of the hexagon is 36 cm.
- II. The area of the hexagon is 6 times the area of an equilateral triangle formed on one of the sides.

90 What is the price per kg of mangoes?

- I. Ten kg mangoes and two dozen oranges cost ₹ 252.
- II. Two kg mangoes could be bought in exchange for one dozen oranges.

91 Consider the following statements about Bhiwani:

1. Bhiwani seems to be a corruption of Bhani.
2. It is popularly known as the gate-way of Rajputana.
3. This town is often called the "Little Kashi of India".

Which of the above statements are correct?

- (A) 1 and 2 only (B) 2 and 3 only
(C) 1 and 3 only (D) 1, 2 and 3 all
(E) Question not attempted

92 Consider the following statements about Badhkal lake/town:

- I. The name Badhkal is possibly derived from word Be-Dakhal.
- II. The lake present here is a natural lake.
- III. Government has turned an artificial lake into a Picnic-cum-holiday resort.
- IV. Initially conceived as an irrigation project, it was to serve as a counter measure for floods and soil erosion.

Which of the above statements is/are correct?

- (A) II, III and IV only (B) I, II and III only
(C) I, III and IV only (D) I, II and IV only
(E) Question not attempted

93 Khawaja Altaf Hussain Hali, the famous urdu poet, belonged to?

- (A) Palwal (B) Panipat
(C) Pinjore (D) Punhana
(E) Question not attempted

94 Jal Mahal situated in Narnaul was got constructed by?

- (A) Ibrahim Khan (B) Shah Quli Khan
(C) Shah Wilayat (D) Rai Mukund Das
(E) Question not attempted

95 Consider the following statements about Bilaspur.

- I. The place is said to be associated with Sage Ved Vyas.
- II. There are a number of tirathas in and around Bilaspur.
- III. The antiquity of this place is established by discovery of image of Ganesha belonging to 11th and 12th century A.D.

Which of the above statements are correct?

- (A) I and II only (B) II and III only
(C) I and III only (D) I, II and III all
(E) Question not attempted

Qs 96-100 : Answer the questions based on the contents of the passage given below :

Joseph Nye, the noted political scientist, introduced the concept of "soft power" in his book *Bound to Lead: The Changing Nature of American Power*. The idea is not to force someone to do something you want him to do, but to make him want what you want him to do. In international relations, this is moving from coercion to co-option (or seduction). Countries can't advertise and so branding must happen differently, by creating an aspirational perception. Nye's proposed soft power comes from culture, political values, and foreign policies. If a country or its people are regarded or admired more than others, it carries a greater soft power. Over time, the concept has become richer. Foreigners learning your language, Olympic medals the country is winning, businesses becoming global, the quality of universities, the architecture or natural beauty of the country and its ancient culture and customs are all tools for enhancing soft power. If culture is a crucial ingredient, and cinema a powerful vehicle for spreading awareness about a country's culture, it in turn becomes a crucial tool for a country's soft power. In judging others our minds will inadvertently rely on their portrayals in their movies if we have seen those. Scholars have noted the significant role Hollywood has played in helping the US win the ideological battle against communism during the Cold War, spreading American values like liberalism and free market. But America is not alone. Korean leaders in the 1990s decided to use their music to build cultural influence after the Asian financial crisis and poured millions of dollars into creating a Ministry of Culture. The result is today's K-Pop. India produces the largest number of movies in the world annually and Indian movies make a lot of money. Records suggest that the year before the pandemic, the Indian film industry pocketed \$ 2.7 billion. In fact, other than the US, India is the only country where a vast majority of cinema is for domestic viewership. In other words, most of the world watches non-native cinema. There is no reason why Indian cinema can't have a more significant influence. Despite being an interdisciplinary field of inquiry at the intersection of international affairs and culture, there is little research on Indian cinema's potential as India's soft power. With the rise of internet-based content, we need to go beyond cinema. The world is changing rapidly and if culture is going to be a valued commodity, it is important to begin investing constructively in nation-building through various channels of its export.

- 96** As per the passage which of the following would work against enhancement of the "soft power" of a country?
- (A) Another country overtaking it in terms of the admiration for its values from the citizens of US.
 - (B) The said country resorting to advertising for the purpose of building its brand value.
 - (C) Forcing another country to fall in line with accepted global norms instead of supporting countries wielding brute power.
 - (D) Trying to coerce a much smaller and economically dependent neighbouring country to fall in line with policies unique to itself even against the wishes of the people of that country.
 - (E) Question not attempted

97 As per the passage which of the following factors are relevant as far as positively influencing the soft power of a country is concerned?

- i. Inviting foreign nationals to its shores to learn the native languages.
- ii. Organising the Olympic Games even though there are bleak chances of any of its athletes winning a medal.
- iii. Exporting quality goods that it produces or setting-up its own manufacturing facilities in foreign countries.

- (A) i and ii (B) ii and iii
(C) i and iii (D) i, ii and iii
(E) Question not attempted

98 Which of the following statements about cinema is implied in the passage?

- i. Both US and Korea have benefitted identically by presenting to the world their unique cultural aspects through cinema.
- ii. Globally India is the country that earns the highest revenue from cinema.
- iii. Majority of the population across the world has access only to foreign movies.

- (A) i only (B) ii and iii only
(C) ii only (D) iii only
(E) Question not attempted

99 It could be inferred from the passage that

- (A) Indian cinema could easily become the most preferred foreign language cinema in the world.
(B) Indian cinema viewers far outnumber the cinema viewers of any other country in the world.
(C) formal research, if undertaken, into the potential of Indian cinema as a soft power will certainly help India to enhance its soft power manifold globally.
(D) Indian cinema is quite an influential medium and, if channelised properly, has the potential to add significantly to the soft power of the country.
(E) Question not attempted

100 The option closest in meaning to the word '*coercion*' as used in the passage is :

- (A) insistence (B) requesting
(C) cooperation (D) caring
(E) Question not attempted

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Final Answer Key of the Master Question Booklet of the Screening Test held on 09.09.2023 for the Posts of Post Graduate Teachers (PGTs) in the subject of Chemistry for Mewat Cadre (Advt No. 34/2023)

Q. No.	Ans Key	Q. No.	Ans Key	Q. No.	Ans Key	Q. No.	Ans Key
1	D	26	D	51	D	76	D
2	A	27	A	52	C	77	B
3	D	28	C	53	A	78	A
4	A	29	A	54	A	79	C
5	D	30	A	55	D	80	A
6	A	31	A	56	B	81	B
7	D	32	A	57	A	82	A
8	C	33	C	58	C	83	A
9	B	34	X	59	C	84	B
10	D	35	A	60	B	85	A
11	C	36	C	61	D	86	B
12	B	37	B	62	C	87	D
13	D	38	C	63	D	88	C
14	C	39	C	64	X	89	A
15	B	40	A	65	C	90	C
16	A	41	D	66	C	91	D
17	B	42	D	67	D	92	C
18	C	43	D	68	D	93	B
19	D	44	C	69	C	94	B
20	D	45	B	70	A	95	D
21	X	46	A	71	X	96	D
22	A	47	A	72	D	97	D
23	B	48	D	73	B	98	D
24	D	49	D	74	C	99	D
25	D	50	C	75	D	100	A

Dy. Secretary
HPSC