

Seat No.	
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ENT-05

Total No. of Pages : 18

P. G. Entrance Examination 2026
**M. Sc. Chemistry (Inorganic/Organic/Physical/
Analytical/Industrial/Applied)**
Subject Code : 58713

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Day and Date : Thursday, 14-05-2026

Total Marks : 100

Time : 10.30 a.m. to 12.00 p.m.
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Instructions

- 1) All questions are compulsory
 - 2) Each question carries 1 mark.
 - 3) Answers should be marked in the given OMR answer sheet by darkening the appropriate option.
 - 4) Follow the instructions given on OMR sheet.
 - 5) Rough work shall be done on the sheet provided at the end of question paper.
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- 1) Which of the following statements about the periodicity of elements is correct?
 - a) The periodicity of elements is based on the atomic weight of each element
 - b) The periodicity of elements is based on the atomic number of each element.
 - c) The periodicity of elements is based on the number of protons in the nucleus of each element
 - d) The periodicity of elements is based on the number of neutrons in the nucleus of each element
- 2) In diborane molecule
 - a) Four bridged hydrogens and two terminal hydrogens are present
 - b) Two bridged hydrogens and four terminal hydrogens are present
 - c) Three bridged hydrogens and three terminal hydrogens are present
 - d) None of the above

- 10) Lactose on hydrolysis yields a mixture of
- a) glucose and fructose
 - b) glucose and galactose
 - c) only glucose
 - d) fructose and galactose
- 11) Which of the following is not a by product of Hoffmann bromamide degradation of acetamide with alcoholic KOH??
- a) KBr
 - b) KCN
 - c) K_2CO_3
 - d) H_2O
- 12) Hydrolysis of ester leads to the formation of which of the following products in an acidic medium?
- a) Alcohol and carboxylic acid
 - b) Alcohol and sodium carboxylate
 - c) Alcohol and ether
 - d) None of the above
- 13) Oxygen on crystallization forms a perfect crystal. The entropy of oxygen at 0 K temperature is Joule
- a) 16
 - b) 32
 - c) zero
 - d) Infinite
- 14) Which of the following is not correct for an ideal solution?
- a) $\Delta S_{\text{mix}} = 0$
 - b) $\Delta H_{\text{mix}} = 0$
 - c) $\Delta V_{\text{mix}} = 0$
 - d) it obeys Raoult's law for entire concentration range and temperature.

- 15) Which of the following is not characteristic of chemisorption?
- a) It is irreversible
 - b) It is specific
 - c) It is multilayer phenomenon
 - d) Heat of adsorption is about 400 kJ
- 16) The process that contaminates the precipitates and also carries the precipitate solution containing soluble impurities is called
- a) Coprecipitation
 - b) Post precipitation
 - c) Digestion
 - d) Reprecipitation
- 17) OSTWALD ripening is
- a) Re precipitation
 - b) Dissolves small particles
 - c) Produces larger particles
 - d) All of the above
- 18) Which gas is evolved at the cathode in aqueous medium?
- a) Chlorine
 - b) Hydrogen
 - c) Oxygen
 - d) Nitrogen
- 19) What is the unit of current density?
- a) A/m²
 - b) A/dm²
 - c) Both a) and b)
 - d) None of these
- 20) The solution used for elution is called
- a) eluent
 - b) effluent
 - c) eluate
 - d) elution
- 21) Cation exchanger possesses charged groups. charged groups and anion exchanger possess.....
- a) positively, negatively
 - b) negatively, positively
 - c) positively, neutral
 - d) negatively, negatively

- 22) Ethyl mercapton is added to LPG to
- a) increase its colorific value
 - b) make it flammable
 - c) timely leakage detection
 - d) make it coloured
- 23) For which of the following statements is lanthanide contraction responsible?
- a) identical oxidation states of Zn and Zr
 - b) approximately equal covalent and ionic radii of Zr and Hf
 - c) identical oxidation states of Zr and Nb
 - d) approximately equal covalent and ionic radii of Zr and Yb
- 24) Magnetic moment for Mn^{2+} is
- a) 5.92 B.M.
 - b) 4.2 B.M.
 - c) 3.9 B.M.
 - d) 7.9 B.M.
- 25) Species having strong tendency to accept electrons and form ionic bond with base, are called
- a) Hard base
 - b) Hard acid
 - c) Soft base
 - d) Soft acid
- 26) HSAB concept can be used to determine:
- a) Stability of complexes
 - b) Predicting feasibility of reactions
 - c) Solubility of compounds in a given solvent
 - d) All the above
- 27) According to CFT, bonding between metal and ligand is
- a) weak
 - b) covalent
 - c) 100% ionic
 - d) semipolar

- 60) Solvay process is used to prepare
- a) Potassium carbonate
 - b) Sodium carbonate
 - c) Sodium hydroxide
 - d) Sodium chloride
- 61) Chemicals which are produced and handled in large lots and are often in a crude state are called
- a) industrial
 - b) toxic
 - c) heavy
 - d) king
- 62) Gas-solid chromatography is best suited for separating
- a) Thermally stable organic components
 - b) Low molecular weight gaseous species
 - c) Thermally stable inorganic components
 - d) Volatile organic components
- 63) Which is not a carrier gas in gas chromatography.
- a) Helium
 - b) Nitrogen
 - c) Argon
 - d) Carbon dioxide
- 64) In the thermodynamic sense complexes are called
- a) Inert and Labile
 - b) Inert and unstable
 - c) Labile and unstable
 - d) Stable and unstable
- 65) In an associative substitution reaction, the intermediate has
- a) Lower coordination number than starting material
 - b) Higher coordination number than starting material
 - c) Same coordination number than starting material
 - d) None of these

- 66) The age determination of organic fossils using carbon dating method is based on the fact that
- C^{14} fraction is same in all objects
 - Ratio of Carbon-14 and Carbon-12 is constant
 - C^{14} is highly insoluble
 - All of these
- 67) When Uranium having atomic number 92 and atomic mass number 235 (${}_{92}U^{232}$) absorbs one neutron and undergoes fission. It generates Krypton having atomic number 36 and atomic mass number 89 (${}_{36}Kr^{89}$), 3 neutrons and
- Barium with atomic number 56 and atomic mass number 144 (${}_{56}Ba^{144}$)
 - Krypton with atomic number 36 and atomic mass number 103 (${}_{36}Kr^{103}$)
 - Zirconium with atomic number 40 and atomic mass number 91 (${}_{40}Zr^{91}$)
 - Krypton with atomic number 36 and atomic mass number 101 (${}_{36}Kr^{101}$)
- 68)are the anomalous oxidation states of lanthanides.
- +1, +3
 - +2, +4
 - +3, +3
 - +2, +3
- 69) The formula of bastnaesite mineral is
- $CePO_4$
 - $CePO_4$
 - (Y) PO_4
 - $CeFCO_3$
- 70) In the L. D. process, the pure and dry oxygen is introduced into molten mass through copper lance under pressure of pounds per square inch.
- 50-90
 - 100-175
 - 95-150
 - 150-95

- 78) Addition of water to unsymmetrical alkyne leads to formation of.....
- a) ketone
 - b) carboxylic acid
 - c) alcohol
 - d) aldehyde
- 79) What is an alkaloid?
- a) A type of hydrocarbons
 - b) A type of isoprene unit containing molecules
 - c) Nitrogen-containing natural products
 - d) Oxygen-containing natural products
- 80) Which of the following is NOT a natural product?
- a) Terpenoids
 - b) Alkaloids
 - c) Nanocomposite
 - d) Proteins
- 81) An ideal drug is expected not to induce
- a) resistance
 - b) sleep
 - c) curative action
 - d) all of these
- 82) Pulmonary tuberculosis is treated with
- a) ethambutol
 - b) benzocaine
 - c) isoniazide
 - d) both a and c
- 83) In Sulphur system, when SR, SM and SV are in equilibrium, here the degree of freedom will be
- a) one
 - b) two
 - c) three
 - d) zero
- 84) Benzene and water system will form phases
- a) zero
 - b) two
 - c) three
 - d) one

98) The secondary electrons radiated back in scanning microscope are collected by?

- a) specimen
- b) detector
- c) vacuum chamber
- d) cathode

99) Among the following, which is not a micro-nutrient

- a) B
- b) Cu
- c) Fe
- d) N

100) Choose the correct top-down process for nanomaterial synthesis from the given set of options.

- a) PVD
- b) CVD
- c) MBE
- d) Ball milling



- Rough Work -