

CUET PG Nanascience - 2025 Question Paper

Time Allowed :1 Hour	Maximum Marks :300	Total Questions :75
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General Instructions

Read the following instructions very carefully and strictly follow them:

1. The test is of 1 hour duration.
2. The question paper consists of 75 questions. The maximum marks are 300.
3. 4 marks are awarded for every correct answer, and 1 mark is deducted for every wrong answer.

1. Micro-organisms responsible for nitrification are

- (1) Nitrosomonas and Nitrobacter
 - (2) Nostoc and Anabaena
 - (3) Rhizobium and Azotobacter
 - (4) Clostridium and Pseudomonas
-

2. Widal test is designed specifically for the diagnosis of

- (1) Tuberculosis
 - (2) Typhoid
 - (3) Dengue
 - (4) Chikungunya
-

3. The genetic material in retroviruses are

- (1) RNA
 - (2) ssDNA
 - (3) dsDNA
 - (4) ds circular DNA
-

4. Barr body is found in

- (1) Normal female germ cell
- (2) Normal male germ cells
- (3) Normal female somatic cells

(4) Normal male somatic cells

5. Superoxide dismutase is involved in the conversion of

- (1) NADP to NADPH
 - (2) Superoxide to Hydrogen peroxide
 - (3) Hydrogen peroxide to hyphohalite
 - (4) FAD to FADH
-

6. Which of the following is not a characteristic of a secondary immune response?

- (1) IgG isotype
 - (2) Low affinity antibodies
 - (3) High affinity antibodies
 - (4) Short or no Lag phase
-

7. Malignant cancer cells have all of the following properties except

- (1) unregulated cell division
 - (2) inhibition of angiogenesis
 - (3) resistance to apoptosis
 - (4) cellular immortality
-

8. How do eukaryotic genome differ from prokaryotic genomes?

- (1) DNA is circular and single stranded in prokaryotes
 - (2) Intervening sequences are present in eukaryotic DNA
 - (3) DNA is complexed with histones in prokaryotes
 - (4) DNA is organised into operons in eukaryotes
-

9. Each individual antigenic determinant of the variable region of the antibody is referred to as:

- (1) paratope
 - (2) epitope
 - (3) agretope
 - (4) idiotope
-

10. Which of the following physiological effects is caused in plants by gibberellic acid?

- (1) Shortening of genetically tall plants
 - (2) Elongation of genetically dwarf plants
 - (3) Rooting in stem cuttings
 - (4) Yellowing of young leaves
-

11. Which of the following is incorrect about racemic mixture?

- (1) Racemic mixture causes finite rotation of plane polarized light
 - (2) It is often designated as ($\pm$)
 - (3) (+)-2-butanol is a racemic mixture
 - (4) Plane polarized light remains invariant inside a racemic mixture
-

12. The Russian Chemist, Mendeleev, is remembered for organizing the elements into periodic table. He received many honours, the greatest of which is having an element named after him. Element Mendeleevium.

- (1) 100
 - (2) 101
 - (3) 102
 - (4) 103
-

13. Which of the following is not a characteristic of a catalyst?

- (1) A catalyst lowers the activation energy of a reaction
 - (2) A catalyst increases the speed of a reaction
 - (3) Only a small quantity of catalyst is needed in a chemical reaction
 - (4) A catalyst is used up during the reaction
-

14. Reduction has taken place if a substance.....

- (1) gains oxygen
 - (2) increase its oxidation state
 - (3) gains hydrogen
 - (4) loses electrons
-

15. Reaction of alkanes with halogens such as chlorine and bromine proceeds

through.....

- (1) Free radical substitution mechanism
 - (2) Electrophilic substitution mechanism
 - (3) Nucleophilic substitution mechanism
 - (4) Decomposition mechanism
-

16.is the breaking down of long chain hydrocarbons into smaller molecules.

- (1) Decomposition
 - (2) Catenation
 - (3) Cracking
 - (4) Combustion
-

17. Which of the following set consists of only planar species?

- (1) XeF_4 , BF_3 , PCl_3
 - (2) XeF_4 , AlF_3 , NCl_3
 - (3) XeF_6 , BF_3 , AlCl_3
 - (4) XeF_4 , BF_3 , BCl_3
-

18. Which of the following is the most reactive aldehyde towards nucleophilic addition reactions?

- (1) Formaldehyde
 - (2) Acetaldehyde
 - (3) Crotonaldehyde
 - (4) Benzaldehyde
-

19. Two isotonic solutions cannot have the same value of

- (1) osmotic pressure
 - (2) density
 - (3) elevation in boiling point
 - (4) depression in freezing point
-

20. An aromatic compound will

- (A) have $(4n+2)$ π electrons
- (B) be conjugated
- (C) be planar
- (D) be cyclic

Choose the correct answer from the options given below:

- (1) (A), (B) and (D) only
 - (2) (B), (C) and (D) only
 - (3) (A), (B), (C) and (D)
 - (4) (A), (B) and (C) only
-

21. SI unit of pressure is

- (1) pascal
 - (2) atm
 - (3) torr
 - (4) newton
-

22. The statement "There is a plenty of room at the bottom" was given by

- (1) Albert Einstein
 - (2) Isaac Newton
 - (3) Richard Feynman
 - (4) Linus Pauling
-

23. Which of the following is a top down approach for the synthesis of nanomaterials?

- (1) Chemical vapour deposition
 - (2) Physical vapour deposition
 - (3) Ball Milling
 - (4) Sol gel process
-

24. Millikan's famous oil drop experiment established that

- (1) Electric charge is quantized
 - (2) Mass is quantized
 - (3) Energy of an atom is quantized
 - (4) Workfunction is quantized
-

25. Which of the following is not the unit of energy?

- (1) Electron-volt
 - (2) Joule
 - (3) Newton-metre
 - (4) Pascal
-

26. An element naturally occurs in two isotopic forms. Which of the following statements is correct?

- (1) Mass number of the two isotopes are same.
 - (2) Atomic number of the two isotopes are same.
 - (3) Number of nucleons are same.
 - (4) Number of neutrons are same.
-

27. The laws of reflection and refraction are true for all surfaces and pairs of media at the

- (1) point of incidence
 - (2) point of refraction
 - (3) angle of incidence
 - (4) angle of reflection
-

28. The dimensions of electrical conductivity is

- (1) $[TA]$
 - (2) $[ML^3T^{-3}A^{-2}]$
 - (3) $[M^{-1}L^{-3}T^3A^2]$
 - (4) $[MLT^{-3}A^{-1}]$
-

29. For the given carbon resistor, the resistance is $2.4 \times 10^6 \Omega$. The sequence of colours in the strips provided on resistor is

- (1) red, yellow and green
 - (2) red, yellow and blue
 - (3) brown, orange and green
 - (4) red, green and yellow
-

30. The packing fraction of a crystal structure is 74%. The crystal structure is

- (1) Simple cubic structure
 - (2) Face-centred cubic structure
 - (3) Body-centred cubic structure
 - (4) Crystal structure of Tungsten
-

31. An s-orbital may combine with p-orbital provided that lobes of p-orbital are

- (1) perpendicular to the axis joining the nuclei
 - (2) pointing along the axis joining the nuclei
 - (3) making an acute angle with the axis joining the nuclei
 - (4) making an obtuse angle with the axis joining the nuclei
-

32. Lyman spectral series is found in region of spectrum

- (1) Ultraviolet
 - (2) Visible
 - (3) Infra red
 - (4) Microwave
-

33. Newton's laws of classical mechanics are replaced in quantum mechanics by.....

- (1) Snell's Law
 - (2) Schrödinger's equations
 - (3) Maxwell's equations
 - (4) Laplace equation
-

34. Principal Quantum number represents

- (1) Quantization of angular momentum magnitude
 - (2) Quantization of angular momentum direction
 - (3) Quantization of energy
 - (4) Space quantization
-

35. Which of the following is incorrect as per rules for Linear Combination of Atomic Orbitals (LCAO)?

- (1) The atomic orbitals overlap as much as possible
- (2) Overlap of orbitals has to be as low as possible

- (3) The atomic orbitals should be of same energy
 - (4) Symmetry of two atomic orbitals must remain unchanged or both change symmetry in the same manner
-

36. If an element of high electronegativity combines with an electropositive metal then the product will be

- (1) an interstitial alloy
 - (2) an ionic compound
 - (3) a substitutional alloy
 - (4) a simple mixture
-

37. Acetophenone and Benzaldehyde can be distinguished by:

- (A) Tollen's reagent
- (B) DNP test
- (C) Iodoform test
- (D) Carbylamine test

Choose the correct answer from the options given below:

- (1) (A), (B) and (D) only
 - (2) (A) and (C) only
 - (3) (A) and (B) only
 - (4) (B) and (D) only
-

38. Explanation for occurrence of monovalency in Group 13 is given by.....

- (1) Pauli's Exclusion Principle
 - (2) Hund's Rule
 - (3) Inert Pair effect
 - (4) Isotope effect
-

39. Which of the following is an example of electromagnetic waves?

- (1) Alpha rays
 - (2) Beta plus rays
 - (3) Beta minus rays
 - (4) Gamma rays
-

40. Which of the following properties is not observed in the case of Superconductors?

- (1) Meissner Effect
 - (2) Formation of Cooper pairs
 - (3) Paramagnetism
 - (4) Zero resistivity
-

41. Newton's law of cooling is a special case of

- (1) Wien's displacement law
 - (2) Kirchhoff's law
 - (3) Stefan's law
 - (4) Planck's law
-

42. The centre of negative charge distribution in a molecule may or may not coincide with the centre of the positive charge distribution. If it does not coincide, each molecule has a permanent dipole moment. Such materials are called

- (1) polar materials
 - (2) non-polar materials
 - (3) ionic materials
 - (4) covalent bonded materials
-

43. A dielectric slab is inserted between the plates of an isolated capacitor. The force between the plates will

- (1) increase
 - (2) remain unchanged
 - (3) decrease
 - (4) become zero
-

44. If no thermal energy is developed as the charge goes through the battery, then such a battery is called

- (1) an ideal battery
 - (2) an ideal dielectric
 - (3) an ideal capacitor
 - (4) an ideal resistor
-

45. In a discharge tube electric conduction does not occur due to the movement of

- (1) positive ions
 - (2) negative ions
 - (3) electrons
 - (4) protons
-

46. Arrange the following in the order of increasing acidic strength

- (A) HCl
- (B) HBr
- (C) HI
- (D) HF

Choose the correct answer from the options given below:

- (1) (A), (B), (C), (D).
 - (2) (D), (A), (B), (C).
 - (3) (B), (A), (D), (C).
 - (4) (C), (B), (A), (D).
-

47. Arrange the following in the order of increasing wavelength

- (A) Lyman
- (B) Balmer
- (C) Paschen
- (D) Brackett

Choose the correct answer from the options given below:

- (1) (A), (B), (C), (D).
 - (2) (D), (C), (B), (A).
 - (3) (B), (A), (D), (C).
 - (4) (C), (B), (D), (A).
-

48. Arrange the following metals in the order of increasing work function

- (A) Potassium (K)
- (B) Cesium (Cs)
- (C) Platinum (Pt)
- (D) Calcium (Ca)

Choose the correct answer from the options given below:

- (1) (A), (B), (C), (D).
- (2) (B), (A), (D), (C).
- (3) (B), (A), (C), (D).

(4) (C), (D), (A), (B).

49. Arrange the following in the order of increasing first ionization energy

- (A) Beryllium (Be)
- (B) Boron (B)
- (C) Lithium (Li)
- (D) Carbon (C)

Choose the correct answer from the options given below:

- (1) (A), (B), (C), (D).
 - (2) (C), (B), (A), (D).
 - (3) (B), (A), (D), (C).
 - (4) (D), (B), (A), (C).
-

50. Arrange the following components in the order of their function in power supply

- (A) Voltage regulator
- (B) Rectifier
- (C) Transformer
- (D) Filter

Choose the correct answer from the options given below:

- (1) (B), (A), (C), (D).
 - (2) (A), (B), (C), (D).
 - (3) (B), (A), (D), (C).
 - (4) (C), (B), (D), (A).
-

51. Arrange the following events in an increasing order (calendar year)

- (A) Nobel Prize in Physics for Photoelectric Effect
- (B) Nobel Prize in Chemistry for Quantum Dots synthesis and Applications
- (C) Nobel Prize for the invention of Scanning Tunneling Electron Microscope
- (D) Nobel Prize to Max Planck for his Quantum Theory

Choose the correct answer from the options given below:

- (1) (A), (B), (C), (D).
 - (2) (A), (D), (C), (B).
 - (3) (D), (A), (C), (B).
 - (4) (C), (B), (D), (A).
-

52. Arrange the following nanomaterials in the order of increasing degree of free-

dom

- (A) Bulk material
- (B) Graphene Sheet
- (C) Quantum Dot
- (D) Carbon Nanotubes

Choose the correct answer from the options given below:

- (1) (C), (D), (B), (A).
- (2) (A), (B), (C), (D).
- (3) (B), (A), (D), (C).
- (4) (C), (B), (D), (A).

53. Which of the following exists as a covalent crystal in the solid state?

- (A) Sulphur
- (B) Iodine
- (C) Phosphorus
- (D) Silicon

Choose the correct answer from the options given below:

- (1) (A) and (C) only
- (2) (D) only
- (3) (B) and (D) only
- (4) (A), (B) and (C) only

54. Arrange the following electron acceptors of Z-scheme of photosynthesis based on the movement of electron from P680 onwards.

- (A) Iron-Sulphur Proteins
- (B) Ferredoxin
- (C) Plastocyanin
- (D) Plastoquinones

Choose the correct answer from the options given below:

- (1) (A), (B), (C), (D).
- (2) (D), (C), (B), (A).
- (3) (D), (A), (B), (C).
- (4) (D), (C), (A), (B).

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- (D) Plastoquinones

Choose the correct answer from the options given below:

- (1) (A), (B), (C), (D).
- (2) (D), (C), (B), (A).
- (3) (D), (A), (B), (C).
- (4) (D), (C), (A), (B).

56. Arrange the following events in an order that explains the bulk flow of substances in the phloem from the source.

- (A) Water diffuses into the sieve tube elements
- (B) Leaf cells produce sugar by photosynthesis
- (C) Solutes are actively transported into sieve elements
- (D) Sugar is transported from cell to cell via the apoplast and/or symplast

Choose the correct answer from the options given below:

- (1) (A), (B), (C), (D).
- (2) (B), (D), (C), (A).
- (3) (B), (A), (D), (C).
- (4) (C), (B), (D), (A).

57. Ionic compounds are

- (A) Made up of positive and negative ions and attraction between ions is electrostatic
- (B) Ionic bonds are non-directional
- (C) Melting point and boiling point are usually low
- (D) Usually soft

Choose the correct answer from the options given below:

- (1) (A) and (D) only
- (2) (A), (B) and (C) only
- (3) (A) only
- (4) (A) and (B) only

58. Which of the following are three-terminal devices?

- (A) Zener diode

- (B) Photodiode
- (C) Bipolar Junction Transistor
- (D) Field Effect Transistor

Choose the correct answer from the options given below:

- (1) (A), (B) and (D) only.
 - (2) (A), (B) and (C) only.
 - (3) (C) and (D) only.
 - (4) (B) and (D) only.
-

59. When the elements react to form compounds, a negative free energy change (ΔG) means

- (A) Spontaneous reaction
- (B) Free energy of the products is higher than that of reactants
- (C) Very high activation barrier
- (D) Exergonic reactions

Choose the correct answer from the options given below:

- (1) (A), (B) and (D) only.
 - (2) (A), (B) and (C) only.
 - (3) (A), (B), (C) and (D).
 - (4) (A) and (D) only.
-

60. On descending the group from Li to Na to K to Rb to Cs

- (A) Metallic radius increases
- (B) Melting point and boiling point decrease
- (C) Density decreases
- (D) Ionization energy decreases

Choose the correct answer from the options given below:

- (1) (A) and (B) only.
 - (2) (B) and (C) only.
 - (3) (A), (B) and (D) only.
 - (4) (A), (C) and (D) only.
-

61. In Cubic lattice,

- (A) For face centered cubic (fcc) lattice, effective number of atoms per unit cell is 2
- (B) For body centered cubic (bcc) lattice, effective number of atoms per unit cell is 4
- (C) $a = b = c$, and $\alpha = \beta = \gamma = 90^\circ$, where a, b, c are edge lengths and α, β, γ are axial angles

(D) For simple cubic (sc) lattice, effective number of atoms per unit cell is 1

Choose the correct answer from the options given below:

- (1) (A), (B) and (D) only.
 - (2) (A), (B) and (C) only.
 - (3) (C) and (D) only.
 - (4) (B), (C) and (D) only.
-

62. Which of the following are correct statements?

- (A) Hydrogen bond is weaker than covalent bond.
- (B) CH_4 has covalent bonds.
- (C) Covalent compounds do not conduct electricity except diamond.
- (D) Graphite is a soft solid and a good conductor of electricity.

Choose the correct answer from the options given below:

- (1) (A), (B) and (D) only.
 - (2) (A), (B) and (C) only.
 - (3) (A), (B), (C) and (D).
 - (4) (B), (C) and (D) only.
-

63. Which option is true for Fischer projection formulas?

- (A) They must be kept in the plane of paper.
- (B) They are not allowed to flip them over.
- (C) They must be rotated in the plane of paper by 90° .
- (D) They must be rotated in the plane of paper by 180° .

Choose the correct answer from the options given below:

- (1) (A), (B) and (D) only.
 - (2) (A), (B) and (C) only.
 - (3) (A), (B), (C) and (D).
 - (4) (B) and (D) only.
-

64. Which of the following halides will undergo S_2 reaction?

- (A) Chlorobenzene
- (B) Benzyl chloride
- (C) Tertiary-butyl chloride
- (D) n-butyl chloride

Choose the correct answer from the options given below:

- (1) (B) and (D) only.
(2) (B), (C) and (D) only.
(3) (A), (B) and (D) only.
(4) (A), (C) and (D) only.
-

65. The third law of thermodynamics relates to

1. The entropy of a perfect crystal at absolute zero temperature.
2. The relation between work and heat.
3. Evolution of entropy of a system with time.
4. Conservation of mass.

Choose the correct answer from the options given below:

- (1) (A) only.
(2) (B) only.
(3) (C) only.
(4) (D) only.
-

66. Match List-I with List-II

List-I	List-II
(A) Snell's Law	(I) Perfect Diamagnetism
(B) Meissner Effect	(II) Refractive Index
(C) Brewster's Law	(III) Polarized Light
(D) Photoelectric Effect	(IV) Quantum theory of light

Choose the correct answer from the options given below:

- (1) (A) (II), (B) (I), (C) (III), (D) (IV)
(2) (A) (II), (B) (III), (C) (I), (D) (IV)
(3) (A) (I), (B) (II), (C) (IV), (D) (III)
(4) (A) (III), (B) (IV), (C) (I), (D) (II)
-

67. Match List-I with List-II

List-I	List-II
Atom	Electronegativity value (on Pauling Scale)
(A) Li	(1) 1.0
(B) Na	(II) 0.7
(C) K	(III) 0.9
(D) Cs	(IV) 0.8

Choose the correct answer from the options given below:

- (1) (A) (I), (B) (III), (C) (IV), (D) (II)
- (2) (A) (I), (B) (III), (C) (II), (D) (IV)
- (3) (A) (I), (B) (II), (C) (IV), (D) (III)
- (4) (A) (III), (B) (IV), (C) (I), (D) (II)

68. Match List-I with List-II

List-I	List-II
Name of the Carbon compound	Oxidation state of the Carbon
(A) Methanol	(I) -2
(B) Formaldehyde	(II) 0
(C) Formic Acid	(III) +2

Choose the correct answer from the options given below:

- (1) (A) (I), (B) (II), (C) (III)
- (2) (A) (I), (B) (III), (C) (II)
- (3) (A) (II), (B) (III), (C) (I)
- (4) (A) (III), (B) (II), (C) (I)

69. Match List-I with List-II

List-I	List-II
Molecules	Most Reactive towards
(A) Ethyl bromide	(I) S_N1
(B) Tertiary butyl bromide	(II) S_N2
(C) Acetone	(III) Electrophilic substitution
(D) Benzene	(IV) Nucleophilic addition

Choose the correct answer from the options given below:

- (1) (A) (II), (B) (I), (C) (IV), (D) (III)
- (2) (A) (I), (B) (III), (C) (II), (D) (IV)
- (3) (A) (I), (B) (II), (C) (IV), (D) (III)
- (4) (A) (III), (B) (IV), (C) (I), (D) (II)

70. Match List-I with List-II

List-I	List-II
Number of carbon atoms	Number of structural isomers
(A) C ₄ H ₁₀	(1) 2
(B) C ₅ H ₁₂	(II) 3
(C) C ₆ H ₁₄	(III) 5
(D) C ₇ H ₁₆	(IV) 9

Choose the correct answer from the options given below:

- (1) (A) (1), (B) (III), (C) (IV), (D) (II)
- (2) (A) (1), (B) (III), (C) (II), (D) (IV)
- (3) (A) (1), (B) (II), (C) (IV), (D) (III)
- (4) (A) (1), (B) (II), (C) (III), (D) (IV)

71. Match List-I with List-II

List-I	List-II
Name of the process	Equipment used
(A) Biolistics	(I) Gene pulser
(B) Agrobacterium	(II) PDS 1000/He
(C) Electroporation	(III) Micromanipulator
(D) Microinjection	(IV) Vir C1

Choose the correct answer from the options given below:

- (1) (A) (I), (B) (II), (C) (III), (D) (IV)
- (2) (A) (II), (B) (IV), (C) (I), (D) (III)
- (3) (A) (I), (B) (II), (C) (IV), (D) (III)
- (4) (A) (III), (B) (IV), (C) (I), (D) (II)

72. Match List-I with List-II

List-I	List-II
Name of the process	Reaction/Conversion
(A) Ammonification	(I) Conversion of atmospheric nitrogen into ammonia
(B) Denitrification	(II) Conversion of organic nitrogen into ammonium
(C) Nitrification	(III) Conversion of nitrite or nitrate into atmospheric nitrogen
(D) Nitrogen fixation	(IV) Conversion of ammonia into nitrate and nitrite

Choose the correct answer from the options given below:

- (1) (A) (I), (B) (II), (C) (III), (D) (IV)
- (2) (A) (II), (B) (III), (C) (IV), (D) (I)
- (3) (A) (I), (B) (II), (C) (IV), (D) (III)

(4) (A) (III), (B) (IV), (C) (I), (D) (II)

73. Match List-I with List-II

List-I	List-II
(A) DNA footprinting (B) Yeast two hybrid system (C) DNA Fingerprinting (D) SAGE	(I) Protein-Protein interaction (II) VNTR (III) DNA binding proteins (IV) Transcriptome analysis

Choose the correct answer from the options given below:

- (1) (A) (I), (B) (II), (C) (III), (D) (IV)
(2) (A) (I), (B) (III), (C) (II), (D) (IV)
(3) (A) (III), (B) (I), (C) (II), (D) (IV)
(4) (A) (III), (B) (IV), (C) (I), (D) (II)

74. Match List-I with List-II

List-I	List-II
Coordination compound	Crystal Field stabilization energy (ignore pairing energy)
(A) $[\text{Fe}(\text{CN})]$ (B) $[\text{Cu}(\text{CN})]$ (C) $[\text{Ni}(\text{Cl})]$ (D) $[\text{Zn}(\text{CN})]$	(I) $0Dq$ (II) $-24Dq$ (III) $-6Dq$ (IV) $-12Dq$

Choose the correct answer from the options given below:

- (1) (A) (I), (B) (II), (C) (II), (D) (IV)
(2) (A) (II), (B) (II), (C) (I), (D) (III)
(3) (A) (I), (B) (II), (C) (III), (D) (IV)
(4) (A) (III), (B) (IV), (C) (I), (D) (II)

75. Match List-I with List-II

List-I	List-II
Compounds	Related properties
(A) Aniline	(I) meta director and deactivator
(B) Nitrobenzene	(II) o
p director and deactivator	
(C) Chlorobenzene	(III) o
p director and activator	
(D) Allene	(IV) Central atom sp hybridized

Choose the correct answer from the options given below:

- (1) (A) (III), (B) (I), (C) (II), (D) (IV)
 - (2) (A) (I), (B) (III), (C) (II), (D) (IV)
 - (3) (A) (I), (B) (II), (C) (IV), (D) (III)
 - (4) (A) (IV), (B) (III), (C) (II), (D) (I)
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