FINAL NEET(UG)–2020 EXAMINATION

(Held On Wednesday 14th OCTOBER, 2020)

CHEMISTRY

TEST PAPER WITH ANSWER

1. Which of the following statement is **NOT** true about acid rain ?

(1) It is due to reaction of SO_2, NO_2 and CO_2 with rain water

(2) Causes no damage to monuments like Taj Mahal.

(3) It is harmful for plants.

(4) Its pH is less than 5.6

Ans. (2)

2. The oxidation number of the underlined atom in the following species

(1) $Cu_2\underline{O}$ is –1 (2) $\underline{Cl}O_3^-$ is +5

(3) $K_2\underline{Cr}_2O_7$ is + 6 (4) $H\underline{Au}Cl_4$ is +3

Identify the incorrect option.

Ans. (1)

3. Reaction of propanamide with ethanolic sodium hydroxide and bromine will give

(1) Ethylamine (2) Methylamine

(3) Propylamine (4) Aniline

Ans. (1)

4. A liquid compound (x) can be purified by steam distillation only if it is

(1) Steam volatile, immiscible with water

(2) Not steam volatile, miscible with water

(3) Steam volatile, miscible with water

(4) Not steam volatile, immiscible with water

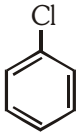
Ans. (1)

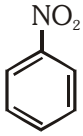
5. Among the compounds shown below which one revealed a linear structure ?

(1) NO_2 (2) HOCl (3) O_3 (4) N_2O

Ans. (4)

6. Which of the following compound is most reactive in electrophilic aromatic substitution ?

(1) 

(2) 

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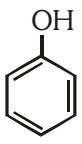
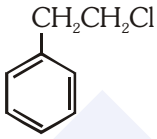
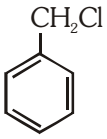
(4) 

Ans. (4)

7. Which of the following will **NOT** undergo S_N1 reaction with $\bar{O}H$?

(1) $CH_2 = CH - CH_2Cl$ (2) $(CH_3)_3\,CCl$

(3) 

(4) 

Ans. (3)

8. Which of the following is **not** true about chloramphenicol ?

(1) It inhibits the growth of only grampositive bacteria.

(2) It is a broad spectrum antibiotic.

(3) It is not bactericidal.

(4) It is bacteriostatic.

Ans. (1)

9. Which of the following statement is correct about Bakelite ?

(1) It is a cross linked polymer.

(2) It is an addition polymer.

(3) It is a branched chain polymer.

(4) It is a linear polymer.

Ans. (1)

10. If for a certain reaction Δ_rH is 30 kJ mol^{-1} at 450 K, the value of Δ_rS (in $JK^{-1}\,mol^{-1}$) for which the same reaction will be spontaneous at the same temperature is

(1) 70 (2) –33 (3) 33 (4) –70

Ans. (1)

11. Match the element in column I with that in column II.

Column-I	**Column-II**
(a) Copper	(i) Non-metal
(b) Fluorine	(ii) Transition metal
(c) Silicon	(iii) Lanthanoid
(d) Cerium	(iv) Metalloid

Identify the correct match :

(1) (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)

(2) (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)

(3) (a)-(iv), (b)-(iii), (c)-(i), (d)-(ii)

(4) (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)

Ans. (2)

12. Which of the following is a free radical substitution reaction ?

(1) Benzene with $Br_2/AlCl_3$

(2) Acetylene with HBr

(3) Methane with Br_2/hv

(4) Propene with $HBr/(C_6H_5COO)_2$

Ans. (3)

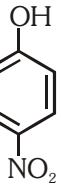
13. The reaction of concentrated sulphuric acid with carbohydrates ($C_{12}H_{22}O_{11}$) is an example of

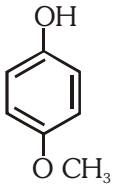
(1) Dehydration (2) Oxidation

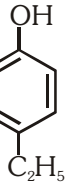
(3) Reduction (4) Sulphonation

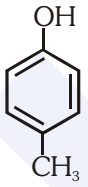
Ans. (1)

14. Which of the following substituted phenols is the strongest acid?

(1) 

(2) 

(3) 

(4) 

Ans. (1)

15. Match the compounds of Xe in column I with the molecular structure in column II.

Column-I	**Column-II**
(a) XeF_2	(i) Square planar
(b) XeF_4	(ii) Linear
(c) XeO_3	(iii) Square pyramidal
(d) $XeOF_4$	(iv) Pyramidal

(1) (a)-(ii) (b)-(i) (c)-(iii) (d)-(iv)

(2) (a)-(ii) (b)-(iv) (c)-(iii) (d)-(i)

(3) (a)-(ii) (b)-(iii) (c)-(i) (d)-(iv)

(4) (a)-(ii) (b)-(i) (c)-(iv) (d)-(iii)

Ans. (4)

16. The half-life for a zero order reaction having 0.02 M initial concentration of reactant is 100 s. The rate constant (in mol L^{-1} s^{-1}) for the reaction is

(1) 1.0×10^{-4} (2) 2.0×10^{-4}

(3) 2.0×10^{-3} (4) 1.0×10^{-2}

Ans. (1)

17. Identify the **incorrect** statement from the following:

(1) Zirconium and Hafnium have identical radii of 160 pm and 159 pm, respectively as a consequence of lanthanoid contraction.

(2) Lanthanoids reveal only +3 oxidation state.

(3) The lanthanoid ions other than the f^0 type and the f^{14} type are all paramagnetic.

(4) The overall decrease in atomic and ionic radii from lanthanum to lutetium is called lanthanoid contraction.

Ans. (2)

18. Match the following aspects with the respective metal.

Aspects	**Metal**
(a) The metal which reveals a maximum number of oxidation states	(i) Scandium
(b) The metal although placed in 3d block is considered not as a transition element	(ii) Copper
(c) The metal which does not exhibit variable oxidation states	(iii) Manganese
(d) The metal which in +1 oxidation state in aqueous solution undergoes disproportionation	(iv) Zinc

Select the correct option :

(1) (a)-(i) (b)-(iv) (c)-(ii) (d)-(iii)

(2) (a)-(iii) (b)-(iv) (c)-(i) (d)-(ii)

(3) (a)-(iii) (b)-(i) (c)-(iv) (d)-(ii)

(4) (a)-(ii) (b)-(iv) (c)-(i) (d)-(iii)

Ans. (2)

19. If 8g of a non-electrolyte solute is dissolved in 114 g of n-octane to reduce its vapour pressure to 80%, the molar mass (in g mol^{-1}) of the solute is [Given that molar mass of n-octane is 114 g mol^{-1}]

(1) 40 (2) 60

(3) 80 (4) 20

Ans. (1)

20. Match the coordination number and type of hybridisation with distribution of hybrid orbitals in space based on Valence bond theory.

Coordination number and type of hybridisation	**Distribution of hybrid orbitals in space**
(a) 4, sp^3	(i) trigonal bipyramidal
(b) 4, dsp^2	(ii) octahedral
(c) 5, sp^3d	(iii) tetrahedral
(d) 6, d^2sp^3	(iv) square planar

Select the correct option :

(1) (a)-(ii) (b)-(iii) (c)-(iv) (d)-(i)

(2) (a)-(iii) (b)-(iv) (c)-(i) (d)-(ii)

(3) (a)-(iv) (b)-(i) (c)-(ii) (d)-(iii)

(4) (a)-(iii) (b)-(i) (c)-(iv) (d)-(ii)

Ans. (2)

21. The number of angular nodes and radial nodes in 3s orbital are

(1) 0 and 2, respectively

(2) 1 and 0, respectively

(3) 3 and 0, respectively

(4) 0 and 1, respectively

Ans. (1)

22. Identify the correct statement from the following.

(1) The order of hydration enthalpies of alkaline earth cations
$Be^{2+} < Mg^{2+} < Ca^{2+} < Sr^{2+} < Ba^{2+}$

(2) Lithium and Magnesium show some similarities in their physical properties as they are diagonally placed in periodic table.

(3) Lithium is softer among all alkali metals.

(4) Lithium chloride is deliquescent and crystallises as a hydrate, $LiCl{\cdot}H_2O$.

Ans. (2)

23. Deficiency of which vitamin causes osteomalacia ?

(1) Vitamin A (2) Vitamin D

(3) Vitamin K (4) Vitamin E

Ans. (2)

24. Identify the wrongly matched pair.

Molecule	**Shape or geometry of molecule**
(1) $PC1_5$	Trigonal planar
(2) SF_6	Octahedral
(3) $BeCl_2$	Linear
(4) NH_3	Trigonal pyramidal

Ans. (1)

25. $CH_3CH_2CH = CH_2 \xrightarrow[H_2O,H_2O_2,OH^-]{B_2H_6} Z$

What is Z ?

(1) $CH_3CH_2CH_2CH_2OH$

(2) $CH_3CH_2\underset{\displaystyle OH}{\underset{|}{C}}HCH_3$

(3) $CH_3CH_2CH_2CHO$

(4) $CH_3CH_2CH_2CH_3$

Ans. (1)

26. Identify the reaction from following having top position in EMF series (Std.red. potential) according to their electrode potential at 298 K.

(1) $Mg^{2+} + 2e^- \rightarrow Mg_{(s)}$

(2) $Fe^{2+} + 2e^- \rightarrow Fe_{(s)}$

(3) $Au^{3+} + 3e^- \rightarrow Au_{(s)}$

(4) $K^+ + le^- \rightarrow K_{(s)}$

Ans. (3)

27. Match the elements in Column I with methods of purification in Column II.

Column I	**Column II**
(a) Boron	(i) Van Arkel method
(b) Tin	(ii) Mond's process
(c) Zirconium	(iii) Liquation
(d) Nickel	(iv) Zone refining

(1) (a)-(iv) (b)-(iii) (c)-(i) (d)-(ii)

(2) (a)-(iv) (b)-(iii) (c)-(ii) (d)-(i)

(3) (a)-(ii) (b)-(i) (c)-(iv) (d)-(iii)

(4) (a)-(iii) (b)-(iv) (c)-(i) (d)-(ii)

Ans. (1)

28. Which among the following salt solutions is basic in nature ?

(1) Ammonium chloride

(2) Ammonium sulphate

(3) Ammonium nitrate

(4) Sodium acetate

Ans. (4)

29. In which of the sols, the colloidal particles are with negative charge ?

(1) TiO_2

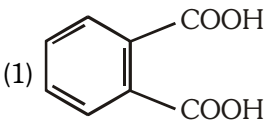
(2) Haemoglobin

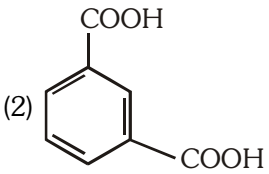
(3) Starch

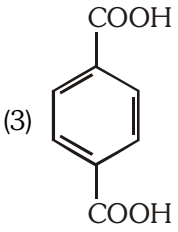
(4) Hydrated $A\ell_2O_3$

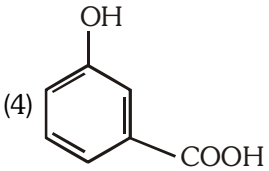
Ans. (3)

30. Which of the following acid will form an (a) Anhydride on heating and (b) Acid imide on strong heating with ammonia ?

(1) 

(2) 

(3) 

(4) 

Ans. (1)

31. In a typical fuel cell, the reactants (R) and product (P) are :-

(1) R = $H_{2(g)}$, $O_{2(g)}$; P = $H_2O_{2(\ell)}$

(2) R = $H_{2(g)}$, $O_{2(g)}$; P = $H_2O_{(\ell)}$

(3) R = $H_{2(g)}$, $O_{2(g)}$, $Cl_{2(g)}$; P = $HClO_{4(aq)}$

(4) R = $H_{2(g)}$, $N_{2(g)}$; P = $NH_{3(aq)}$

Ans. (2)

32. In collision theory of chemical reaction, Z_{AB} represents

(1) the fraction of molecules with energies greater than E_a

(2) the collision frequency of reactants, A and B

(3) steric factor

(4) the fraction of molecules with energies equal to E_a

Ans. (2)

33. Which of the following statement is **not** true about glucose ?

(1) It is an aldohexose.

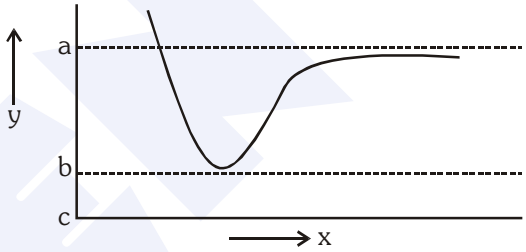
(2) It contains five hydroxyl groups.

(3) It is a reducing sugar.

(4) It is an aldopentose.

Ans. (4)

34. The potential energy (y) curve for H_2 formation as a function of internuclear distance (x) of the H atoms is shown below.



The bond energy of H_2 is :

(1) (b – a)

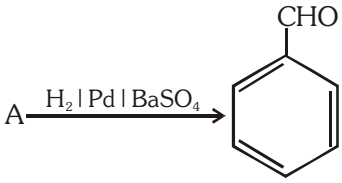
(2) $\frac{(c-a)}{2}$

(3) $\frac{(b-a)}{2}$

(4) (c – a)

Ans. (1)

35. Identify compound (A) in the following reaction :



(1) Benzoyl chloride

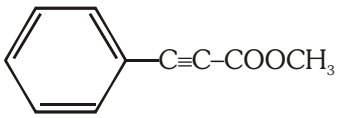
(2) Toluene

(3) Acetophenone

(4) Benzoic acid

Ans. (1)

36. How many (i) sp^2 hybridised carbon atoms and (ii) π bonds are present in the following compound ?



(1) 7, 5 (2) 8, 6
(3) 7, 6 (4) 8, 5

Ans. (3)

37. At standard conditions, if the change in the enthalpy for the following reaction is -109 kJ mol^{-1}

$$H_{2(g)} + Br_{2(g)} \rightarrow 2HBr_{(g)}$$

Given that bond energy of H_2 and Br_2 is 435 kJ mol^{-1} and 192 kJ mol^{-1}, respectively, what is the bond energy (in kJ mol^{-1}) of HBr?

(1) 368 (2) 736
(3) 518 (4) 259

Ans. (1)

38. The minimum pressure required to compress 600 dm^3 of a gas at 1 bar to 150 dm^3 at 40°C is

(1) 4.0 bar (2) 0.2 bar
(3) 1.0 bar (4) 2.5 bar

Ans. (1)

39. What is the role of gypsum, $CaSO_4.2H_2O$ in setting of cement ? Identify the correct option from the following :

(1) to fasten the setting process
(2) to provide water molecules for hydration process
(3) to help to remove water molecules
(4) to slow down the setting process

Ans. (4)

40. Which of the following oxide is amphoteric in nature?

(1) SnO_2 (2) SiO_2
(3) GeO_2 (4) CO_2

Ans. (1)

41. Which one of the following reactions does not come under hydrolysis type reaction ?

(1) $SiCl_{4(l)} + 2H_2O_{(l)} \rightarrow SiO_{2(s)} + 4HCl_{(aq)}$
(2) $Li_3N_{(s)} + 3H_2O_{(l)} \rightarrow NH_{3(g)} + 3LiOH_{(aq)}$
(3) $2F_{2(g)} + 2H_2O_{(l)} \rightarrow 4HF_{(aq)} + O_{2(g)}$
(4) $P_4O_{10(s)} + 6H_2O_{(l)} \rightarrow 4H_3PO_{4(aq)}$

Ans. (3)

42. Which one of the following compounds shows both, Frenkel as well as Schottky defects ?

(1) AgBr
(2) AgI
(3) NaCl
(4) ZnS

Ans. (1)

43. One mole of carbon atom weighs 12 g, the number of atoms in it is equal to, (Mass of carbon – 12 is 1.9926×10^{-23} g)

(1) 1.2×10^{23}
(2) 6.022×10^{22}
(3) 12×10^{22}
(4) 6.022×10^{23}

Ans. (4)

44. Isotonic solutions have same

(1) vapour pressure
(2) freezing temperature
(3) osmotic pressure
(4) boiling temperature

Ans. (3)

45. The solubility product for a salt of the type AB is 4×10^{-8}. What is the molarity of its standard solution?

(1) 2×10^{-4} mol/L
(2) 16×10^{-16} mol/L
(3) 2×10^{-16} mol/L
(4) 4×10^{-4} mol/L

Ans. (1)