Paper Code - 5002

M.Sc. Semester-III Chemistry (Old Course)

July-Septermber-2021

CHNN-601 Inorganic Chemistry

કુલ સમય :– : ૬૦ મીનીટ કુલ પ્રશ્નો : ૫૦ વિદ્યાર્થીએ ટીક કરવાના પ્રશ્નો : ૩૫

નોંધ : વિદ્યાર્થીએ માત્ર ૩૫ પ્રશ્નો જ ટીક કરવાના રહેશે. જો વધારે ટીક કરેલ હશે તો પ્રથમ ૩૫ પ્રશ્નો જ ગણતરીમાં લેવામાં આવશે.

1 Electron spin resonance
A Is also called electron paramagnetic resonance
B Is technique in absorption spectroscopy for detection of paramagnetism
C Is very similar in principles with NMR spectroscopy
D All of these

2 Electron spin resonance is applicable to
A Transition metal ion B Transition metal complexes C Free redicals and bi radicals D All of these

3 Electron spin resonance is applicable to
A Conduction electron in metal B Molecule with triplate state electrons C A and B D None of these

4 The klystron tube source produces radiation at a constant frequency of about
A 5000 MHz B 2000 MHz C 9500 MHz D 1000 MHz

5 Mn^{+2} has a nuclear spin of
A 1/2 B 5/2 C 3/2 D 1

6 The p- benzo semiquinone radical ion $[O.C_6H_4.O]^-$
A Contains 4 equivalent protons B Exhibits a hyperfine splitting of 2.37 gauss
C A and B D None of these

7 The most widely used standard reference substance in ESR is
A 1,1 diphenyl-2-picrylhydroxyl free radical B TMS C A and B D All of these

8 The frequency range of 9000-10000 MHz lies in the region
A visible B Microwave C ultraviolet D Infrared

9 Which of the following ions are not expected to be studied by Electron spin resonance spectroscopy
A Cs^+ B Al^{+3} C Mg^{+2} D All of these

10 Which of the following material for X ray tubes
A Cu B Mo C Both A and B D None of these

11 X ray can be detected by methods
A They ionizes gases B They affect photographic plates
C They penetrate matter D All of these

12 NQR spectra is generally observed in
A Gaseous state B Liquid state C Solid state D All state

13 In NQR spectroscopy, n is measure of
A Viscosity B Non-symmetry of EFG C Symmetry of EFG D Spins

14 Which of the following nuclei are expected to exhibit NQR spectra
A Nitrogen B Aluminium C Chlorine D All

15 Which of the following nucleus has I = 3/2
A Nitrogen B Boron C Chlorine D Aluminum

16 All nuclei lack dipole moments but those with I greater than ½ have a ----- that gives them ------moments
A Charge symmetry, dipole B Charge symmetry, Quadrupole
C Charge symmetry, Quadrupole D Charge density, dipole

17 Which of the following statements are correct
A The quality of x-ray is determined by their absorption coefficient in aluminium
B Hard rays have greater penetrating power
C The x-ray are hard if absorption coefficient is small
D All of these

18 In ionization chamber the cylinder is filled with a gas usually at atmospheric pressure which of the following gas are increasingly active for the purpose
A Hydrogen B F C CO D All of these

19 Which of the following are gas ionization detectors
A Ionisation chamber B Geiger-Muller counters C Proportional detectore D All of these

20 Which of the following statements are correct for K capture
A Electron capture of K-capture produces X-radiation
B Both
C K-capture involves capture of K –electron by the nucleus and formation of the element of the next lower atomic number
D None of these

21 Which of the following can be used as crystal for X-ray gratings
A Topaz B ADP C EDT D All

22 Which of the following isotopes are used as sources of X-rays or gamma rays
A Fe-55 B Am-241 C Co-60 D All of these

23 The analytical uses of electromagnetic radiation in X-ray region are similar in many respects to the application of ultraviolet and visible radiation. In X-ray region, there may be
A Emission B Diffraction C Absorption D All of these

24 Which of the following statement are correct for ionization chamber
A SO2 gas is ordinary used for soft X-rays B SO2 used for hard X-rays
C CH3Br is used for soft X-rays D None of these

25 The detection and determination of the relative intensity of X radiation is accomplished
A By the darkening of photographic film or plate
B By mesearuement of visible radiation produced when the beam strikes a suitable phosphor
C By measurement of ion currents produced when the beam is absorbed by a gas
D All

26 Example for anti-ferro-magnetic materials
A salts of transition elements B rare earth elements C transition metals D Ferrites

27 Example for ferri-magnetic materials
A rare earth elements B salts of transition elements C Ferrites D transition metals

28 Magnetic susceptibility para-magnetic materials is
A 10^{-5} to 10^{-2} B -10^{-5} C $+10^{-5}$ D 105

29 Indicate which of the following material does not retain magnetism permanently.
A Soft iron B Stainless steel C Hardened steel D None of the above

30 The ratio of intensity of magnetization to the magnetization force is known as
A Flux density B Susceptibility C Relative permeability D None of the above

31 A permeable substance is one
A Through which the magnetic lines of force can pass very easily B Which is a good conductor
C Which is a bad conductor D Which is a strong magnet

32 The solid state structure of Me_2Be
A consists of monomers with linear Be B consists of dimers with trigonalplanar Be
C is trimeric with trigonal planar Be D is polymeric with tetrahedral Be

33 Which statement about organoaluminium compounds is incorrect
A Dimers of $AlMe_3$ possess delocalized Al–C–Al bonding interactions
B The bonding in $Al_2Me_4Cl_2$ can be described in terms of a localized scheme
C In $Al_2Ph_4(\mu\text{-}C{\equiv}CPh)_2$, the bridge bonds can be described in a similar way to those in $Al_2Me_4(\mu\text{-}Ph)_2$
D $Al_2\{CH(SiMe_3)_2\}_4$ contains an Al–Al bond

34 Match the molecule to the shape at the central atom centre. Which pairing is correct
A $In(CH_2Ph)_3$; trigonal pyramidal B $Me_3Al(py)$ (py = pyridine); tetrahedral
C R_2Ge (R = $CH(SiMe_3)_2$); linear D Me_2TeCl_2; tetrahedral

35 1,2-$(Me_2As)_2C_6H_4$ is important as
A a chelating ligand for heavy d-block metals B a chelating ligand for early, first row d-block metals
C a chelating ligand for alkali metal ions D a chelating ligand for lanthanoid metal ions

36 Which method susceptibility measurement
A Gouy s method B Koff s methods C Moh s method D None of these

37 Which of the following components of the X-ray fluorescent spectrometer induces fluorescent radiation?
A Excitation source B Energy analyser C X-ray spectrometer D Detection System

38 Find out following which is advantages of X ray methods
A Non dustructive B Applied crystalline or amorphous sample
C Both A and B D None of these

39 Which laws are connected with X ray spectrochemical analysis
A Mosley s law B Mho s law C Ferraday s law D None of these

40 EFG connected with _____
A NQR B ESR C NMR D X-ray

41 Find out of following which is types of substances with unpaired electron
A Stable and unstable paramagnetic substances B balenced and unbalanced paramagnetic substances
C Stable and unstable dimagnetic substances D None of these

42 Basic source of magnetism _____.
A Charged particles alone B Movement of charged particles
C Magnetic dipoles D Magnetic domains

43 Example for soft magnet
A 45 Permalloy B CrO2 C Fe-Pd D Alnico

44 Find out of following which is properties of OMC
A The bond between the metal and the carbon atom is often highly covalent in nature.
B Most of the organometallic compounds exist in solid states, especially the compounds in which the hydrocarbon groups are aromatic or have a ring structure
C The compounds consisting of highly electropositive metals such as sodium or lithium are very volatile and can undergo spontaneous combustion
D All of these

45 How can calculate the binding energy BE of the electron in the sample
A BE=$h\nu$−KEelectron B BE=$h\nu$+KEelectron C BE=$h\nu$=KEelectron D None of these

46 How many peaks would you expect in the PES spectrum of neutral calcium
A 6 B 4 C 8 D 2

47 when electrons in a metal are exposed to light of sufficient radiation, the electrons are ejected from the metal surface related to_____
A PES B AAS C AES D ESR

48 Which are correct for curie s law
A magnetic susceptibility is inversely proportional to the temperature
B magnetic susceptibility is inversely proportional to the temperature
C Both A and B
D none of these

49 Ziegler–Natta catalysts are used to
A polymerize terminal alkenes B terminal alkanes C Both A and B D none of these

50 Find out of folloing which is correct methods of synthesis of organo metallic compounds
A Oxidative addition B Reductive elimination C Both A and B D None of these