

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.

- electron spin resonance involves detecting the detection of physical phenomenon of electromagnetics radiation
 (A) Adsorption (B) Absorption (C) Radiation (D) Reflection
- The value of the magneti moment is known as which of the following ?
 (A) Thompson magneton (B) Bohr megnetons (C) Goldstein magnetons (D) Rutherford magnetons
- If the population ground state exceeds the population of the excited state a net absorption of _____ radiation takes place
 (A) Infrared (B) Ultraviolet (C) Microwave (D) X- rays
- The population ration can be given by which of the following laws ?
 (A) Bohr law (B) Beer – lambert law (C) Kelvin law (D) Boltzman law
- the sensivity of measurement is greatly enhance by using which of the following
 (A) High magnetic field (B) Low magnetic field (C) High electronic field (D) Low electronic field
- Reflex klystron is used in which of the following frequency range ?
 (A) 1000 – 2000Mhz (B) 1000 – 10,000 Mhz (C) 1000 – 15000 Mhz (D) 1000 – 20,000 Mhz
- Klystron can generate power in which of the following range ?
 (A) 10 – 100 mw (B) 10 – 200 mw (C) 10 – 500 mw (D) 100 – 400 nw
- Which of the following are considered to be the lowest form of electromagnetics radiation
 (A) IR radiation (B) Micro waves (C) UV radiation (D) Radio waves
- The amount of energy available in radio frequency radiation is sufficient for which of the following?
 (A) Excite an atom (B) Vibrate an atom (C) Vibrate a molecules (D) nuclear spin of an atom
- Nuclei having either the number of protons or neutrons as add have _____ spin
 (A) Integral spin (B) Half gral spin (C) Zero spin (D) Positive spin
- If the number of protons or neutron is even the spin of the nucleuse will be which of the following
 (A) Integral spin (B) Half gral spin (C) Zero gral spin (D) Positive spin
- NQR spectroscopy indicates the chemical nature the _____ and spatial position of _____
 (A) Electron , protons (B) Neutrons, electron (C) Nuclei, electron (D) Nuclei, neighbing nuclei
- Which of the following is also known x- rays photoelectron spectroscopy
 (A) Auger electronic spectroscopy (B) electron impact spectroscopy
 (C) Electron spectroscopy for chemical analysis (D) Secondary ion mass spectroscopy
- Which of the following is the typ of electron spectroscopy ?
 (A) auger electron spectroscopy (B) Electron impact spectroscopy
 (C) Electron spectroscopy for chemical analysis (D) Secondary ion mass spectroscopy
- ESCA gives sufficient chemical information up to a depth about _____ armstrong in metals
 (A) 5- 20 (B) 15 – 40 (c) 40- 100 (D) 100 – 200
- ESCA gives sufficient chemical information up to depth about _____ armstrong in polymers
 (A) 5- 20 (B) 15 – 40 (C) 40 – 100 (D) 100 – 200
- ESCA gives sufficient chemical information up to a depth about _____ armstrong in oxide
 (A) 5- 20 (B) 15- 40 (C) 40 – 100 (D) 100 – 200
- ESCA can identify electron in the periodic table above which of the following
 (A) Carbon (B) Boron (C) Helium (D) Potassium
- ESCA focusses on which of the following information
 (A) Mass of the electron (B) Charge of the electron (C) Binding energy of the electron (D) Mass of the atoms
- which of the following is the detection limit of ESCA ?
 (A) 0.1% monolayer (B) 0.5% monolayer (C) 1% monolayer (D) 2% monolayer
- The charaterisation of auger spectroscopy can be achieved up to which of the following depth
 (A) 1 nm (B) 2nm (C) 4 nm (D) 8nm
- Aunger electron spectroscopy can be used for surface chemical analysis in a way similar to which of the following ?
 (A) ESCA (B) SIMS (C) ISS (D) Ion spectroscopy
- Qualitative chemical analysis is very often performed using which of the following
 (A) ESCA (B) SIMS (C) AES (D) Ion spectroscopy

24. Electron ionisation can produce which of the following ?
 (A) ESCA electron (B) AUGER electron (C) Ion electron (D) Photo electron
25. In ESCA process the photon ejects which of the following ?
 (A) 1s electron (B) 1p electron (C) 2s electron (D) 2p electron
26. In auger process a electron drops to fill which of the following
 (A) 1s hole (B) 1p hole (C) 2s hole (D) 2p hole
27. In auger spectroscopy beam current are typically _____ in a beam of diameter 0.5 mm
 (A) 5- 10 Ua (B) 5- 20uA (C) 5- 30 Ua (D) 5-50 uA
28. How is the specificity of auger electron spectroscopy
 (A) very bad (B) Bad (C) Good (D) very good
29. Which of the following is the detection limit of auger electron spectroscopy
 (A) 0.1% Monolayer (B) 0.5% Monolayer (C) 1% Monolayer (D) 2% Monolayer
30. AEX is more sensitive than XPS because of which of the following factors ?
 (A) Binding energy of electron (B) Kinetic energy of electron (C) Mass of electron (D) Mass to charge ratio of electron
31. Tesla is unit of
 (A) Field strength (B) Inductance (C) Flux density (D) Flux
32. A magnetic field exists around
 (A) Iron (B) Copper (C) Aluminum (D) Moving charges
33. Ferrites are materials
 (A) Paramagnetic (B) Diamagnetic (C) Ferromagnetic (D) None
34. Air gap has _____ electron as compared to iron or steel path
 (A) Little (B) lower (C) higher (D) zero
35. Which of the following is a vector quantity?
 (A) Relative permeability (B) Magnetic field intensity (C) Flux density (D) Magnetic potential
36. Magnetising steel is normally difficult because
 (A) It corrodes easily (B) It has high permeability
 (C) It has high specific gravity (D) It has low permeability
37. The unit of relative permeability is
 (A) Henry/ meter (B) Henry (C) Henry / sq.meter (D) It is dimension
38. The main constituent of permalloy is
 (A) Cobalt (B) Chromium (C) nickel (D) tungsten
39. The use of permanent magnets is not made in
 (A) Magnetons (B) Energy meter (C) Transformers (D) Loud- speaker
40. In the left hand rule fore finger always represents
 (A) Voltage (B) Current (C) Magnetic fields (D) None
41. Oxidation no of Co in $\{Co(NO)(CO)_3\}$ is
 (A) 1 (B) 2 (C) 3 (D) -1
42. Find out the metal metal bond in the complex $Os_4(CO)_{14}$
 (A) 4 (B) 5 (C) 2 (D) 6
43. The hexanuclear metal carbonyl $\{Rh(CO)_{16}\}$ have bridging CO = ?
 (A) 2 (B) 4 (C) 5 (D) 6
44. Amongst the following the metal that does not form homoleptic polynuclear metal carbonyl ?
 (A) Al (B) Cu (C) Co (D) Mg
45. If compound $\{W(Cp)_2(CO)_2\}$ follows 18 electron rule what is the hapticity of Cp ?
 (A) 5&5 (B) 3&5 (C) 3&3 (D) 1&5
46. How many metal metal bonds are present in $\{CpMo(CO)_2\}$?
 (A) 1 (B) 2 (C) 0 (D) 4
47. Ferrocene cannot undergo which of the following reaction ?
 (A) Friedel craft acylation (B) Field alder reaction (C) Oxidation by agents (D) Electrophilic substitution
48. $Mn(CO)_5$ is isolobal with which of the following compound ?
 (A) CH_4 (B) CH_3 (C) CH_2 (D) CH
49. Which property's is the same for isolobal molecule ?
 (A) Electron capture (B) Boiling point (C) Melting point (D) Solubility
50. Which of the following is not considered as an organometallic compound?
 (A) Ferrocene (B) Cis-platin (C) Ziegler salt (D) Grignard reagent