

TEST SERIES CSIR-NET/JRF DEC. 2018

BOOKLET SERIES **A**

INORGANIC CHEMISTRY

Paper Code **01**

Test Type: **TEST SERIES**

CHEMICAL SCIENCES

Duration: 2:00 Hours

Date: 16-11-2018

Maximum Marks: 180

Read the following instructions carefully:

* Single Paper Test is divided into **THREE** Parts.

Part - A: This part shall carry **10** questions. Each question shall be of **2** marks.

Part - B: This part shall carry **20** questions. Each question shall be of **2** marks.

Part - C: This part shall contain **30** questions. Each question shall be of **4** marks.

* Darken the appropriate bubbles with HB pencil/Ball Pen to write your answer.

* There will be negative marking @25% for each wrong answer.

* The candidates shall be allowed to carry the Question Paper Booklet after completion of the exam.

* For rough work, blank sheet is attached at the end of test booklet.



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PART – A

- Find unit digit of $(4928)^{121} - (2129)^{122} - (2^4)^{162} = ?$
(a) 2 (b) 1 (c) 5 (d) 7
- In a class of 180 students where number of boys are half of the number of girls, Arun is Ranked 134th from the top. If there are 18 girls after of Arun, then number of boys after Arun is
(a) 30 (b) 28 (c) 25 (d) 24
- An advertisement in 'The Hindu' says-'learn a foreign language course to get a high paid job' based on this statement conclude which one is true.
(i) Those who learn foreign language course get high paid job.
(ii) Only foreign language course can provide a high paid job
(a) only (i) follows (b) Only (ii) follows (c) both follows (d) None follows
- Water stored in a reservoir of rectangular shape having a dimension, of 80 m, 60 m and 6.5 m. In how much time the reservoir can be emptied by a pipe having a square cross section whose side is 20 cm if water flows at a speed 15 km/h through the pipe.
(a) 52 (b) 60 (c) 45 (d) 40
- If in a certain code 'do' is coded as '35' 'her' is coded as '50' What will be the code for 'him' ?
(a) 62 (b) 51 (c) 45 (d) 55
- An Aeroplane flying horizontally at a height of 3 km above the ground at a certain time it subtends an angle of 60° at a point on ground and after 15 sec it produces a angle of 30° . What is the velocity of the aeroplane in m/sec. ($\sqrt{3} = 1.732$) (approx)
(a) 252 m/sec (b) 260 m/sec (c) 145 m/sec (d) 231 m/sec
- A criminal noticed by a police inspector from a distance of 200 m. After seeing, the police the thief starts running at a speed of 10 km/hour and the police starts chasing at a speed of 11 km/hr. What is the total distance covered by the inspector when he catches the thief.
(a) 1.5 km (b) 3 km (c) 2.2 km (d) 2.5 km
- The calendar for the year 1990 would be exactly same with the which calendar year.
(a) 2000 (b) 1996 (c) 2001 (d) 1995
- How many times hour and minute hand of a clock makes right angle in a full rotation of a clock.
(a) 22 (b) 24 (c) 44 (d) 12
- If two unbiased dices are thrown together then what is the probability of coming a sum of 8 from two dices
(a) $\frac{1}{9}$ (b) $\frac{5}{36}$ (c) $\frac{1}{6}$ (d) $\frac{1}{12}$

PART – B

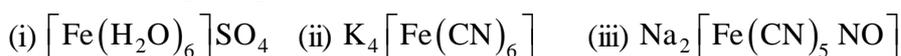
- I_2 has less solubility in H_2O but its solubility increases on adding KI solution. When KI and I_2 are mixed then a species X is formed. Hybridization and shape of anionic part of X respectively is
(a) sp^3 , pyramidal (b) sp^3d , trigonal bipyramidal
(c) sp^3d , linear (d) sp^3d , see-saw
- In the process $N_2^- \rightarrow N_2$, the electron is removed from _____ provided the x-axis is the bond formation axis.
(a) π_{2py}^* orbital (b) π_{2px}^* orbital (c) σ_{2px} orbital (d) σ_{2s} orbital



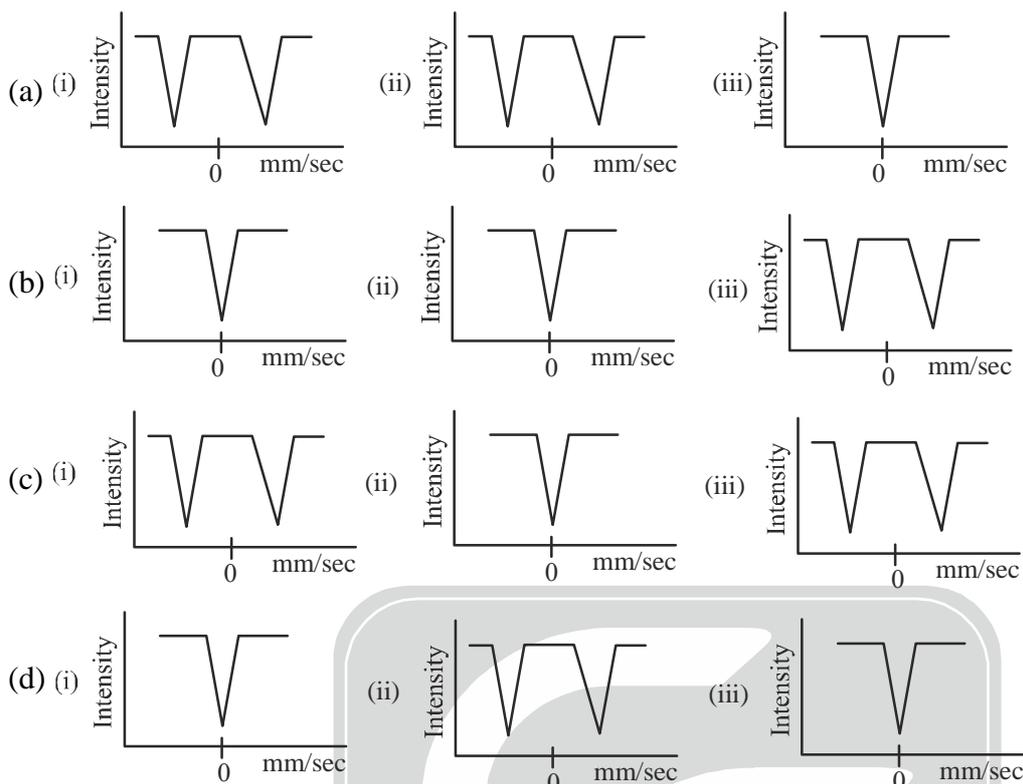
13. Among the following pairs, those in which both species have similar structures are
 (A) N_3^- and I_3^- (B) $\text{Fe}(\text{CO})_5$ and $[\text{CdCl}_5]^{3-}$
 (C) IF_8^- and $[\text{XeF}_8]^{2-}$ (D) MnO_4^- and SF_4
 (a) A and B (b) A, B and C (c) B, C and D (d) A, C and D
14. The correct statement among following is
 (a) $\text{Na} > \text{Mg} > \text{B} > \text{Al} \rightarrow$ metallic character
 (b) $\text{F} > \text{N} > \text{B} > \text{C} > \text{Si} \rightarrow$ non-metallic character
 (c) $\text{Cu} > \text{Ag} < \text{Au}$ correct sequence of first ionization potential
 (d) $d^5 > p^3 < d^{10} < p^6$ relative stability of filled sub-shells.
15. What is not true about borax?
 (a) Molecular formula is $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$
 (b) Crystalline borax contain tetranuclear unit of $[\text{B}_4\text{O}_5(\text{OH})_4]^{2-}$
 (c) It hydrolyses to give an acidic solution
 (d) White crystalline solid.
16. The silicate anion in the mineral **kinoite** is a chain of three SiO_4^{4-} tetrahedra that share corner with the adjacent tetrahedra, the mineral also contains Ca^{2+} ions, Cu^{2+} ions and water molecule in **1 : 1 : 1** ratio. The mineral is represented as
 (a) $\text{CaCuSi}_3\text{O}_{10} \cdot \text{H}_2\text{O}$ (b) $\text{CaCuSi}_3\text{O}_{10} \cdot 2\text{H}_2\text{O}$
 (c) $\text{Ca}_2\text{Cu}_2\text{Si}_3\text{O}_{10} \cdot 2\text{H}_2\text{O}$ (d) None of these
17. The X and Y in given reactions are
 (I) ${}_{19}\text{K}^{38} \longrightarrow {}_{18}\text{Ar}^{38} + \text{X}$ (II) ${}_{80}\text{Hg}^{197} + \text{Y} \longrightarrow {}_{79}\text{Au}^{197}$
 (a) ${}^4_2\text{He}$ and ${}^0_{-1}\beta$ (b) ${}^4_2\text{He}$ and ${}^0_1\beta$ (c) ${}^0_{-1}\beta$ and ${}^0_1\beta$ (d) ${}^0_1\beta$ and ${}^0_{-1}\text{e}$
18. Consider the statements regarding Bohr's effect
Statement-I: The affinity of hemoglobin for O_2 decreases with increase in pH.
Statement-II: Protons shift the equilibrium towards the T-form by binding to surface amino acids.
 (a) Both statements are correct and statement **II** is correct explanation of **I**
 (b) Both statements are correct and statement **II** is not correct explanation of **I**
 (c) Only statement **I** is correct
 (d) Only statement **II** is correct.
19. Match the **Column-I** with **Column-II**
- | Column-I | Column-II |
|--------------------------------|-----------------------------|
| (P) Wilson's disease | (1) Au |
| (Q) Magnetic resonance imaging | (2) Fe |
| (R) Arthritis | (3) Cd |
| (S) Siderosis | (4) Cu |
| (T) Itai-Itai disease | (5) Gd |
| (a) P-4, Q-5, R-3, S-2, T-1 | (b) P-3, Q-2, R-1, S-5, T-4 |
| (c) P-4, Q-5, R-1, S-2, T-3 | (d) P-4, Q-1, R-5, S-3, T-2 |
20. Match the **Column-I** with **Column-II**
- | Column-I | Column-II |
|--|----------------------------|
| (P) High electronegativity and low polarisability | (I) Soft Bases |
| (Q) Low electronegativity and high polarisability | (II) Hard Bases |
| (R) Small size and high positive oxidation state | (III) Soft Acids |
| (S) Large size with zero or low positive oxidation state | (IV) Hard acids |
| (a) P-I, Q-II, R-III, S-IV | (b) P-II, Q-I, R-IV, S-III |
| (c) P-IV, Q-III, R-II, S-I | (d) P-III, Q-IV, R-I, S-II |

21. The correct statement is
 (a) The tetrahedral geometry is more stable for **Ni(II)** than for **Co(II)**
 (b) Solid CrF_3 surrounded by Six F^- ion in an octahedral geometry, two at distance of 190 pm while four at 179 pm
 (c) Solid MnF_3 surrounded by six F^- ion all at distance of 190 pm.
 (d) None of these
22. The complexes $[\text{Co}(\text{NH}_3)_5\text{X}]^{2+}$ have charge transfer to metal band. The complex would you expect to show higher wavelength of charge transfer band if X is
 (a) F^- (b) Cl^- (c) Br^- (d) I^-
23. Predict the product (equimolar mixture of reactant)
 $[\text{Pt}(\text{CO})\text{Cl}_3]^- + \text{NH}_3 \longrightarrow (\text{A})$
 $[\text{Pt}(\text{NH}_3)\text{Br}_3]^- + \text{NH}_3 \rightarrow (\text{B})$
 (a) A – Cis $[\text{Pt}(\text{CO})(\text{NH}_3)\text{Cl}_2]$, B – Cis $[\text{Pt}(\text{NH}_3)_2\text{Br}_2]$
 (b) A – Trans $[\text{Pt}(\text{CO})\text{NH}_3\text{Cl}_2]$ B – Trans $[\text{Pt}(\text{NH}_3)_2\text{Br}_2]$
 (c) A – Cis $[\text{Pt}(\text{CO})(\text{NH}_3)\text{Cl}_2]$, B – Trans $[\text{Pt}(\text{NH}_3)_2\text{Br}_2]$
 (d) A – Trans $[\text{Pt}(\text{CO})(\text{NH}_3)\text{Cl}_2]$, B – Cis $[\text{Pt}(\text{NH}_3)_2\text{Br}_2]$
24. Stability of a lanthanoid (Ln) dihalide LnX_2 with respect to disproportionation into LnX_3 and **Ln** is greatest for
 (a) I (b) Br (c) F (d) Cl
25. Match the correct set of IR bands to the given compounds
List-A (Compound) **List-B ($\nu_{\text{C-O}}$ in cm^{-1})**
 (A) $(\eta^5\text{-Cp})_2\text{Ti}(\text{CO})_2$ (I) 1956 & 1875
 (B) $(\eta^5\text{-Cp}^*)(\eta^5\text{-Cp})\text{Ti}(\text{CO})_2$ (II) 1930 & 1850
 (C) $(\eta^5\text{-Cp}^*)_2\text{Ti}(\text{CO})_2$ (III) 1979 & 1897
 (a) A-III, B-I, C-II (b) A-II, B-I, C-III (c) A-I, B-II, C-III (d) A-I, B-III, C-II
26. Arrange the following in order of increasing $\nu_{\text{C-O}}$ stretching frequency
 (A) CO (free), (B) M–CO, (C) M–CO–M, (D) $\begin{array}{c} \text{O} \\ | \\ \text{M}-\text{C}-\text{M} \\ | \\ \text{M} \end{array}$
 (a) $\text{D} < \text{C} < \text{A} < \text{B}$ (b) $\text{A} < \text{B} < \text{C} < \text{D}$ (c) $\text{D} < \text{C} < \text{B} < \text{A}$ (d) $\text{B} < \text{C} < \text{A} < \text{D}$

27. In the following complexes



The correct match of Mossbauer spectrum is



28. The ESR frequency of a free electron in a magnetic field of 0.34 T is

[Given : $g = 2.0023$ and $\beta = 9.273 \times 10^{-24} \text{ J/T}$, $h = 6.626 \times 10^{-34} \text{ J-sec}$]

- (a) 20.0 GHz (b) 9.50 GHz (c) 19.0 GHz (d) 10.50 GHz

29. In TGA, the weight loss curve depends on the following instrumental factors

- (a) furnace heating (b) recording or charge speed
(c) furnace atmosphere (d) all of the above

30. The diffusion limited current in a polarographic experiment is reached when

- (a) the reactant activity and the product activity at the electrode surface area equal
(b) the reactant activity and product activity in solution are equal
(c) the reactant activity at the electrode surface is equal to zero
(d) the product activity at the electrode surface is equal to zero.

PART – C

31. SbF_5 reacts with XeF_4 and XeF_6 to form ionic compound **A** and **B** respectively. The shape of cation in **A** and **B** respectively are

- (a) Square pyramidal, T-shaped (b) T-shaped, square pyramidal
(c) See-saw, square pyramidal (d) Square pyramidal, see-saw

32. If **s-p** intermixing is not considered then which of followings characteristics is changed in C_2 ?

- (A) Number of electron in gerade molecular orbitals
(B) Bond order
(C) Magnetic behaviour
(D) Dipole moment

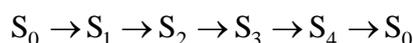
Correct answer is/are

- (a) A and B (b) A and C (c) B and C (d) C and D



33. CO_2 is passed through sodium metaborate solution followed by crystallisation. The state (s) of hybridization of B in product is
 (a) sp^2 (b) sp^3 (c) sp^2 and sp^3 (d) sp^3 and dsp^2
34. Identify the correct statement(s) for the elements **Ar**, **Si**, **Na** and **Cl**
 (I) The ionisation energy of **Ar** is highest than other elements
 (II) The electrical conductivity of **Si** is more than other elements
 (III) The electron affinity of **Cl** is more than other elements
 (IV) The smallest size element among following is **Cl**
 (a) I and II (b) II and III (c) I, III and IV (d) III and IV
35. Consider the statement(s)
 (I) Alkane are more stable than silane
 (II) CCl_4 is used as fire extinguisher but not CS_2
 (III) Diamond is inert but graphite is not
 (IV) Nitrolium act as a good nitrogenous fertiliser
 The correct answer(s) is
 (a) I and II (b) III and IV (c) I and III (d) All are correct
36. **Statement-1:** Red phosphorous is denser and chemically less reactive than white phosphorous
Statement-2: Red phosphorous is regarded as polymer and consisting of chain of P_4 tetrahdra linked together.
 (a) Statement-1 and 2 are correct and statement-2 is correct explanation of statement-1
 (b) Statement-1 and 2 are correct and statement-2 is not explanation of statement-1
 (c) Statement-1 is correct while statement-2 is incorrect
 (d) Statement-1 is incorrect while statement-2 is correct.
37. Consider the statement(s)
 (I) There is no **S-S** bond in $\text{S}_2\text{O}_7^{2-}$
 (II) The **Xe-F** bond strength in $[\text{XeF}]^+$ is greater than that of $[\text{XeF}_2]$
 (III) The mobilities of the alkali metal ions in aqueous solution follow the sequence
 $\text{Li}^+ > \text{Na}^+ > \text{K}^+ > \text{Rb}^+ > \text{Cs}^+$
 (IV) BeF_2 and NH_4F formed on thermal decomposition of $[\text{NH}_4]_2[\text{BeF}_4]$
 The correct answer is
 (a) I, II and III (b) II and IV (c) I and IV (d) I, II and IV
38. Consider the statements
 (I) **HSCN** form stronger hydrogen bond with water than **HCN**
 (II) On the basis of molecular orbital diagram NO^- can react with H^+ to form a chemical bond, the structure is more likely **HON** not **HNO**
 (III) XeF_2 can act as Lewis base toward Ag^+ and Cd^{2+} in these cases XeF_2 to exert it basicity through the lone pair of **Xe** not **F**.
 (IV) The proton affinities of benzophenone is greater than diethyl ketone and acetone.
 The incorrect answer is
 (a) I and II (b) II and III (c) III and IV (d) I and IV
39. Calculate the decay constant and the average life time of ^{55}Co radio nuclide if its activity is known to decrease 4% per hour. Assume that decay product of ^{55}Co is non-radioactive
 (a) $2 \ln 3$ (b) $2 \ln 5$ (c) $4 \ln 2$ (d) $4 \ln 5$
40. The *incorrect* statement among the following is
 (a) Mossbauer spectroscopy shows that the two **Fe(III)** ions in oxyhemerythrin are in different environment
 (b) Oxyhemerythrin is diamagnetic and EPR inactive
 (c) The blue color of oxyhemocyanin is due to LMCT
 (d) O_2 bind with hemerythrin in O_2^- form whereas bind with hemocyanin in O_2^{2-} form.

41. The correct statement(s) among the following is/are
 (A) In bacterial rubredoxin, there are two sulfur bridges
 (B) In rubredoxin, iron atom is coordinated with two acid non-labile sulfur atoms of cysteine group
 (C) In ferredoxin Fe_2S_2 , active site consist of two di- μ -sulfido bridged high spin tetrahedral Fe(III) ions.
 (D) In ferredoxin Fe_2S_2 , Fe(III) ions are antiferromagnetically coupled and thus ESR inactive
 (a) A, B and C (b) B and C (c) A and D (d) C and D
42. Consider the statement(s) for photosystem(PS)
 (A) The chlorophyll **a** site of **PS-II** absorbs quanta of higher energy than that of **PS-I**
 (B) In dark, **PS-II** is in its ground state, has no tendency to release an electron
 (C) The electron transfer between pheophytin and plastoquinone is catalysed by an enzyme containing an active iron centre
 (D) During the oxidation of water to dioxygen, the oxygen evolving complex runs through five successive states,



The correct answer is

- (a) A, B and D (b) A, B and C (c) B, C and D (d) all of these
43. The incorrect statement regarding Co-enzyme B_{12} is
 (a) The corrin ring is modified porphyrin ring which has one less methyne ($=\text{CH}-$) bridge between the two pyrrole rings
 (b) The reaction of ATP with vitamin B_{12} yields direct cobalt-carbon bond between adenosyl and cobalt
 (c) Alkyl cobalamins are unstable towards acid but thermo and photo-inert organocobalt complexes
 (d) One electron reduction of this enzyme can be achieved by the biological reducing agent FAD (Flavin Adenine Dinucleotide)

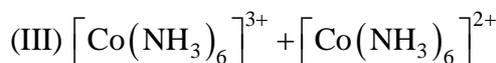
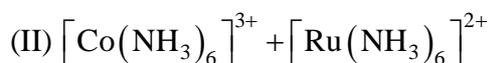
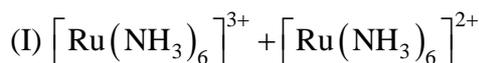
44. The total number of possible isomer for an octahedral complex having formula, $[\text{M}(\text{ABC})(\text{NH}_3)(\text{H}_2\text{O})\text{Br}]$ where ABC is the tridentate ligand



45. Consider the statement(s)
 (1) The colour of $\text{trans}-[\text{Co}(\text{en})_2\text{F}_2]^+$ is more intense than those of $\text{cis}-[\text{Co}(\text{en})_2\text{F}_2]^+$
 (2) The colour of $\text{trans}[\text{Co}(\text{en})\text{Cl}_2]^+$ is more intense than those of $\text{trans}-[\text{Co}(\text{en})\text{F}_2]^+$
 (3) The number of d-d band observed in electronic spectrum of an octahedral Cr(III) complex is two
 (4) Red crystalline $[\text{NiCl}_2(\text{PPh}_2\text{CH}_2\text{Ph})_2]$ is paramagnetic

The incorrect answer is

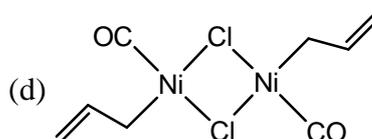
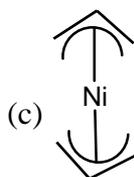
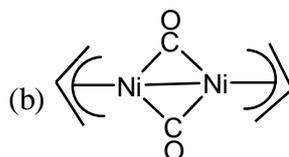
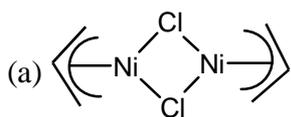
- (a) 1, 2 and 4 (b) 2 and 3 (c) 3 and 4 (d) 1, 3 and 4
46. The relative values of the rate constant ($\text{k}/\text{dm}^3\text{mol}^{-1}\text{s}^{-1}$) for the following electron transfer reaction in aqueous solution respectively are



- (a) (I) 10^{-8} , (II) 10^{-2} , (III) 10^4 (b) (I) 10^4 , (II) 10^{-2} , (III) 10^{-8}
 (c) (I) 10^{-2} , (II) 10^{-8} , (III) 10^4 (d) (I) 10^4 , (II) 10^{-8} , (III) 10^{-2}

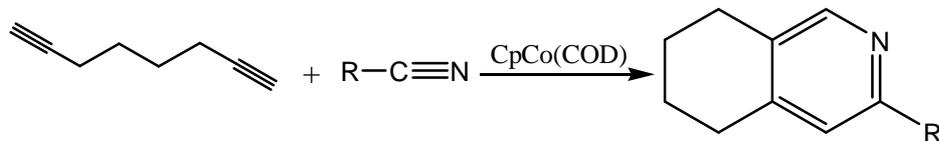


47. Consider the following statement(s)
 (I) Many actinoids oxides are non-stoichiometric whereas few lanthanoids oxides are non-stoichiometric
 (II) Ln^{2+} complexes are strong reducing agents
 (III) In solid states, salts of UO_2^{2+} contain linear cation.
 (IV) Thorium form iodides of formulae ThI_3 , ThI_2 both show metallic conductivity
 The correct answer is
 (a) I and II (b) II and III (c) II, III and IV (d) all are correct.
48. Consider the following statement(s)
 (I) Eu^{3+} and Sm^{3+} show abnormal magnetism
 (II) For Eu and Yb third ionisation energy is highest among lanthanoids
 (III) Actinoids show more variable oxidation states than lanthanoids
 (IV) Absorption peaks of actinoids is broader than lanthanoids.
 The correct answer is
 (a) I and II (b) III and IV (c) II, III and IV (d) all are correct
49. Consider the statement(s)
 (I) The most destabilised orbital in crystal field splitting of pentagonal bipyramidal complexes is d_{z^2} whereas d_{yz} and d_{xy} is most stabilised in square pyramidal complexes.
 (II) The total number of microstates for $3p^1 3d^1$ configuration is 60.
 (III) The splitting of H term in tetrahedral field is T_1 , T_2 and A_2 .
 (IV) ${}^3\text{A}_2$ is ground state for d^2 tetrahedral complex.
 The correct answer is
 (a) I and II (b) II and III (c) I, II and IV (d) II, III and IV
50. Identify the correct statement(s) for magnetic moment of transition metal complexes
 (a) The configuration other than t_{2g}^3 and t_{2g}^6 make orbital contribution to the magnetic moment of octahedral complexes
 (b) The orbital contribution is possible in complexes in general in which the ground state of metal ion is electronically doubly degenerate
 (c) $[\text{Co}(\text{NH}_3)_6]^{3+}$ is paramagnetic in nature whereas $[\text{Co}(\text{NO}_2)_6]^{4+}$ is diamagnetic.
 (d) K_2PtCl_4 is paramagnetic in nature.
51. Select the complex(s) having half life of substitution reaction less than one minute
 (A) $[\text{Cr}(\text{CN})_6]^{4-}$, (B) $[\text{Cr}(\text{CN})_6]^{3-}$, (C) $[\text{Co}(\text{H}_2\text{O})_6]^{2+}$, (D) $[\text{Fe}(\text{CN})_6]^{4-}$
 The correct answer is
 (a) A, B (b) B, C (c) A, C (d) C, D
52. Two moles of $\text{Ni}(\text{CO})_4$ reacted with two moles of allylchloride ($\text{CH}_2=\text{CH}-\text{CH}_2\text{Cl}$) with copious evolution of a colourless gas to give a new compound which gave 16 electron count, IR spectra of new compound did not show any bands in the range of $1650\text{-}2200\text{ cm}^{-1}$. While chemical analysis after decomposition indicated presence of chlorine. M-M bonds are also not present in the new molecules.

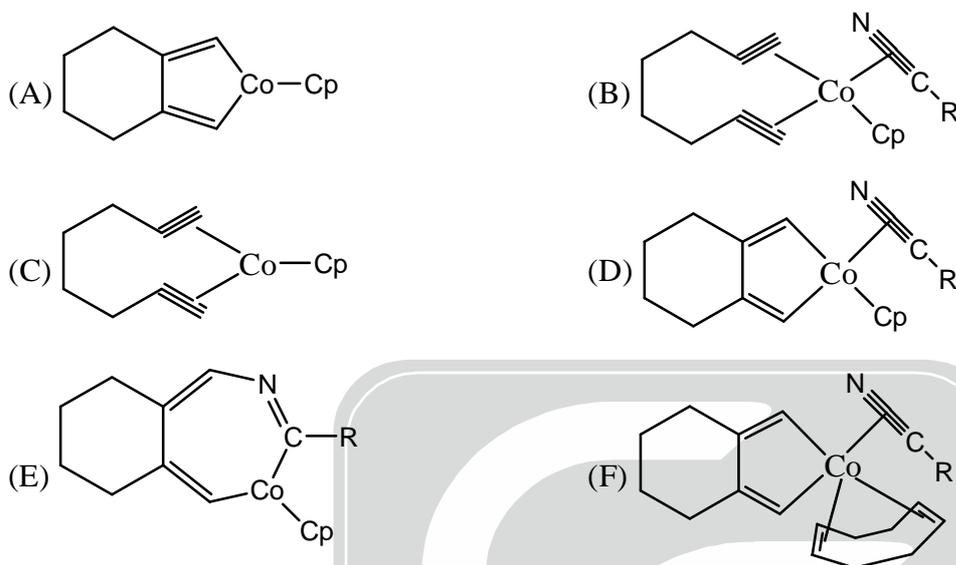


53. Among the given structure some are possible intermediate for the cyclotrimerization reaction given in the scheme-I. Select the right structures and arrange them in the correct sequence in which the reaction mechanism is most likely to proceed

Scheme-I:

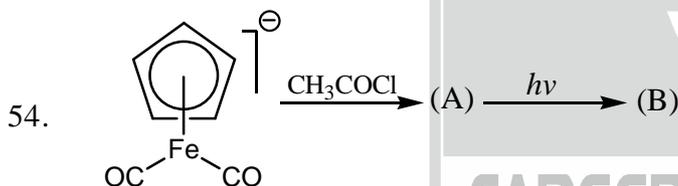


Intermediates:

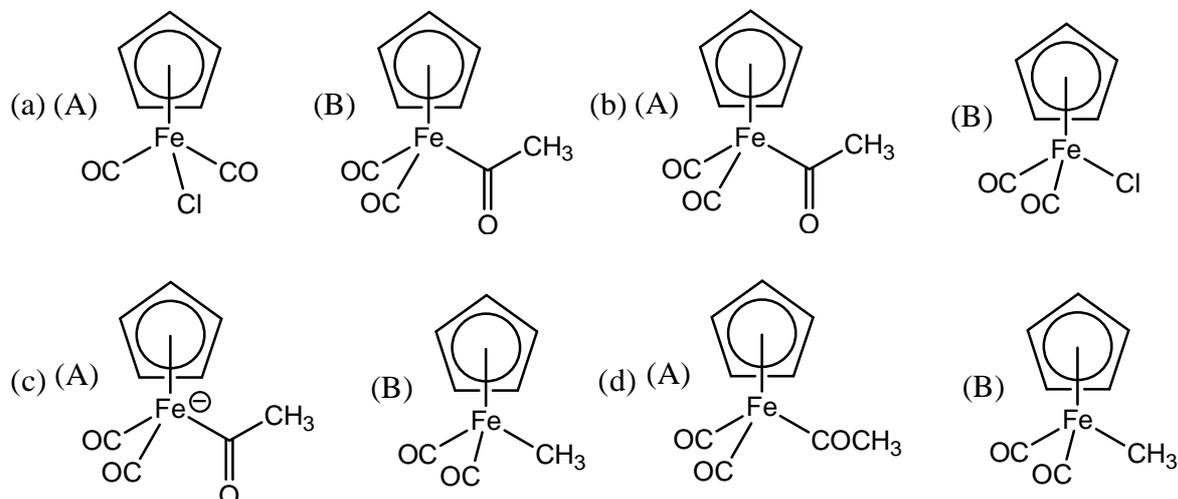


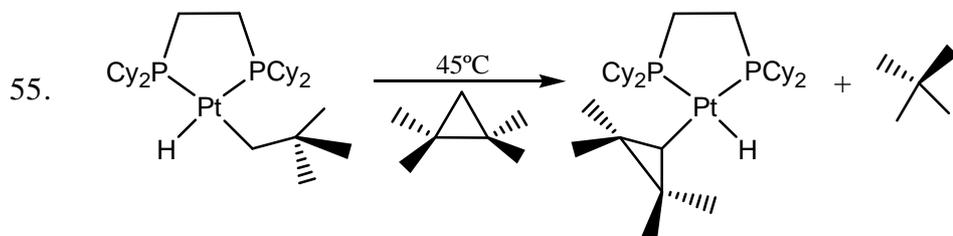
The correct order, sequence are

- (a) C → A → D → E
 (b) E → D → A → C
 (c) A → B → C → D → E → F
 (d) F → E → C → D



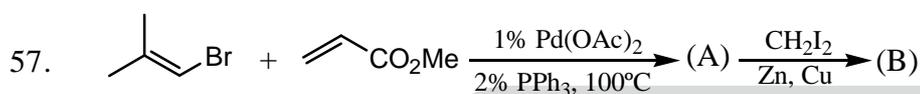
The major product (A) and (B) in the above reaction are (given the compound (B) have no IR band near $1700-1600\text{ cm}^{-1}$)



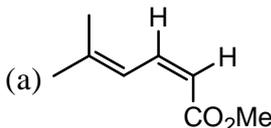
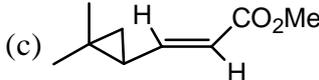


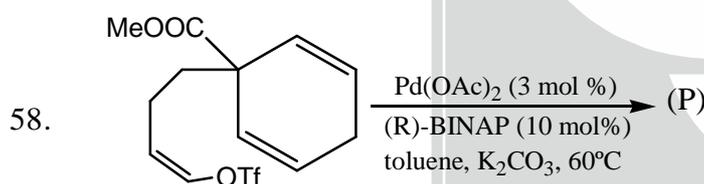
The major step in the above synthetic transformation is

- (a) Oxidative addition followed by reductive elimination
 (b) Reductive elimination followed by oxidative addition
 (c) Migratory insertion followed by reductive elimination
 (d) β -elimination followed by migratory insertion
56. Which of the following homoleptic binuclear carbonyl complex does not have (μ^2 -CO)
- (a) $\text{Co}_2(\text{CO})_8$ solid and $\text{Co}_4(\text{CO})_{12}$ (b) $\text{Mn}_2(\text{CO})_{10}$ and $\text{Os}_2(\text{CO})_9$
 (c) $\text{Fe}_2(\text{CO})_9$ and $\text{Os}_2(\text{CO})_9$ (d) $\text{Ir}_4(\text{CO})_{12}$ and $\text{Co}_2(\text{CO})_8$ (solution)

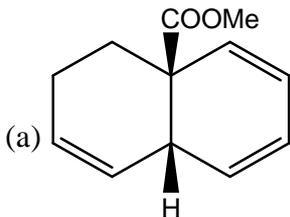
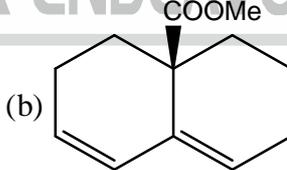
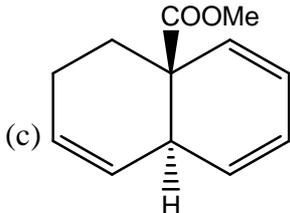
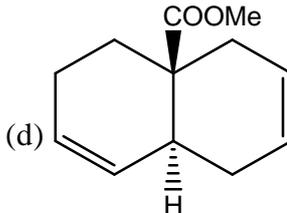


The major product (B) in the above synthetic transformation is

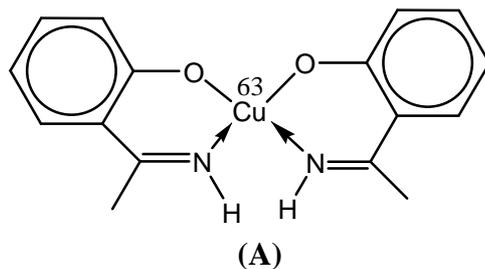
- (a) 
 (b) 
 (c) 
 (d) 



The major product (P) in the above synthetic transformation is

- (a) 
 (b) 
 (c) 
 (d) 

59. For a complex **A**, NH proton affect the EPR spectrum. The total number of hyperfine lines and intensity pattern (experimentally one bench) in the EPR spectrum of **A**



- (a) 60, 1 : 2 : 1 : 2 : 4 : 2 : 3 : 6 : 3 : 2 : 4 : 2 : 1 : 2 : 1
 (b) 44, 1 : 2 : 3 : 4 : 5 : 6 : 5 : 4 : 3 : 2 : 1
 (c) 15, 1 : 2 : 3 : 4 : 4 : 3 : 2 : 1
 (d) 11, 1 : 2 : 3 : 4 : 5 : 4 : 3 : 2 : 1
60. In $^{57}\text{Fe}^*$ Mossbauer experiment the shift in frequency of source is 70.5 MHz and the velocity of source moved towards absorber is 4.5 mm/sec. The frequency of emitted radiation is
 (a) 25.5 MHz (b) 19.5 keV (c) 19.5 MHz (d) 25.5 keV



Space for rough work





CHEMICAL SCIENCES

Date : 16-11-2018

TEST SERIES-A

ANSWER KEY

PART-A

- | | | | | | | |
|--------|--------|---------|--------|--------|--------|--------|
| 1. (b) | 2. (b) | 3. (d) | 4. (a) | 5. (b) | 6. (d) | 7. (c) |
| 8. (c) | 9. (a) | 10. (b) | | | | |

PART-B

- | | | | | | | |
|---------|---------|---------|---------|---------|---------|---------|
| 11. (c) | 12. (a) | 13. (b) | 14. (c) | 15. (c) | 16. (c) | 17. (d) |
| 18. (a) | 19. (c) | 20. (b) | 21. (d) | 22. (d) | 23. (d) | 24. (a) |
| 25. (a) | 26. (c) | 27. (c) | 28. (b) | 29. (d) | 30. (c) | |

PART-C

- | | | | | | | |
|---------|---------|---------|---------|---------|---------|---------|
| 31. (b) | 32. (b) | 33. (c) | 34. (c) | 35. (d) | 36. (a) | 37. (d) |
| 38. (b) | 39. (b) | 40. (d) | 41. (d) | 42. (d) | 43. (c) | 44. (d) |
| 45. (d) | 46. (b) | 47. (d) | 48. (d) | 49. (c) | 50. (a) | 51. (c) |
| 52. (a) | 53. (a) | 54. (d) | 55. (b) | 56. (d) | 57. (c) | 58. (a) |
| 59. (b) | 60. (b) | | | | | |

