

# TEST SERIES CSIR-NET/JRF JUNE 2018

BOOKLET SERIES **B**

## INORGANIC CHEMISTRY

Paper Code **01**

Test Type: **TEST SERIES**

### CHEMICAL SCIENCES

Duration: 2:00 Hours

Date: 26-05-2018

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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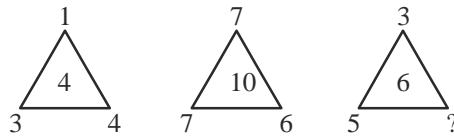


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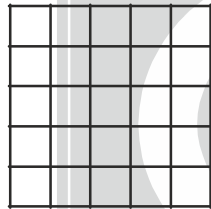
## PART – A

1. The number at the place of question mark is



- (a) 5 (b) 3 (c) 4 (d) 6
2. A, B, C, D and E are sitting on a bench. A is sitting next to B, C is sitting next to D, D is not sitting with E who is on the left end of the bench. C is on the second position from the right. A is to the right of B and E. A and C are sitting together. In which position A is sitting?
- (a) between B and D (b) between B and C  
(c) between E and D (d) between C and E
3. The perimeter of a circle, a square and an equilateral triangle are equal. Which one of the following statements is true?
- (a) The circle has the largest area (b) The square has the largest area  
(c) The equilateral triangle has the largest area (d) All the three shapes have the same area

4. How many rectangles (which are not squares) are there in the following figure?



- (a) 180 (b) 170 (c) 100 (d) 225
5. Air is an
- (a) compound (b) element (c) electrolyte (d) mixture
6. Two glasses of equal volume are respectively half and three-fourth filled with milk. They are then filled to the brim by adding water. Their contents are then poured into another vessel. What will be the ratio of milk to water in the vessel?
- (a) 1:3 (b) 2:3 (c) 3:2 (d) 5:3
7. In a certain code, SIKKIM is written as THLJLL. How is TRAINING written in that code?
- (a) SQBHOHOF (b) UQBHOIOF  
(c) UQBHOHOI (d) UQBHOHOF
8. Choose the box that is similar to the box formed from the given sheet of paper (X)



(X)



(1)



(2)



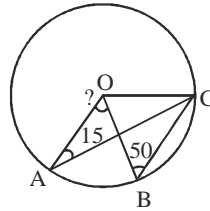
(3)



(4)

- (a) 1 and 4 only (b) 3 and 4 only (c) 1 and 2 only (d) 2 and 3 only
9. If Neena says, "Anita's father Raman is the only son of my father-in-law Mahipal". Then how is Bindu, who is the sister of Anita, related to Mahipal?
- (a) Niece (b) Daughter (c) Daughter-in-law (d) None of these

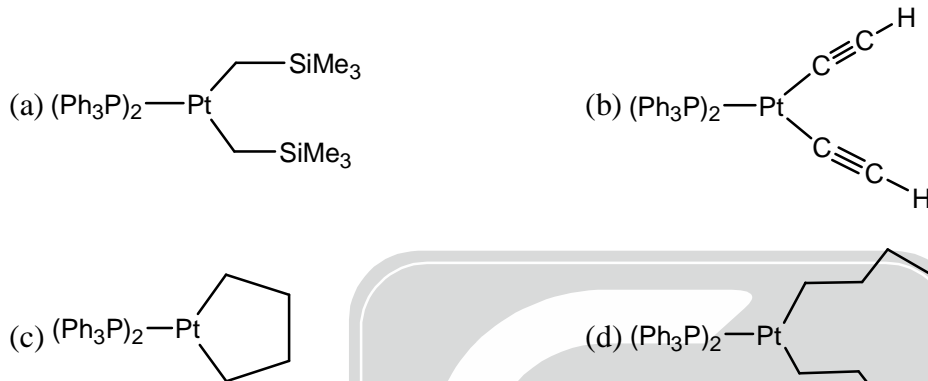
10. In the given figure O is the centre  $\angle OBC = 50$  and  $\angle OAC = 15$ . Then the value of the  $\angle AOB$  is



- (a) 30                      (b) 40                      (c) 20                      (d) 70

## PART – B

11. The most unstable Pt- $\sigma$  complex is



12. One of the excited state configuration for  $\text{N}_2$  molecule is  $3\sigma_g^1, 1\pi_g^1$ , term symbol for this configuration is

- (a)  $^1\Sigma_g$                       (b)  $^3\Pi_g$                       (c)  $^3\Pi_u$                       (d)  $^1\Delta_g$

13. Correct order of bond enthalpy is

- (a)  $\text{N-F} > \text{P-F} > \text{As-F}$                       (b)  $\text{F-F} < \text{Cl-Cl} < \text{Br-Br}$   
 (c)  $\text{Si-O} > \text{C-O} > \text{Ge-O}$                       (d)  $\text{C-H} > \text{Ge-H} > \text{Si-H}$

14.  $\text{Ln}^{3+}$  ions having highest value of reduction potential  $E_{\text{Ln}^{3+}|\text{Ln}^{2+}}^0$  is

- (a)  $\text{Yb}^{3+}$                       (b)  $\text{Sm}^{3+}$                       (c)  $\text{Tm}^{3+}$                       (d)  $\text{Eu}^{3+}$

15. Geometry of  $\text{W}(\text{CH}_3)_6$  is

- (a) Distorted  $\text{O}_h$                       (b) Octahedral                      (c) Trigonal prismatic                      (d) Hexagonal

16. Lanthanoids show strong emission spectrum in comparison d-block elements this is due

- (a) strong interaction between f-orbital and ligand  
 (b) more number of microstates in lanthanoids  
 (c) Lesser number of microstates in lanthanoids  
 (d) Laporte allowed f-f transition in lanthanoids.

17. Indicate the oxidation state of metal ion and of  $\text{O}_2$  ligand in oxyhemocyanine

- (a) Cu(I) and one peroxide ion ( $\text{O}_2^{2-}$ )                      (b) Cu (II) and one superoxide ion ( $\text{O}_2^-$ )  
 (c) Cu(II) and one peroxide ion ( $\text{O}_2^{2-}$ )                      (d) Cu(I) and one superoxide ion ( $\text{O}_2^-$ )

18. The catalase activity for the decomposition of hydrogenperoxide ( $\text{H}_2\text{O}_2$ ) into water and oxygen

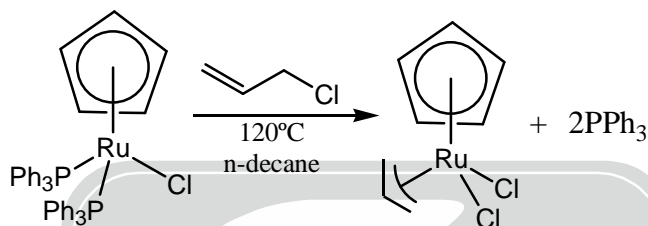
- (a) Inhibits by carbon monoxide  
 (b) Inhibits by cyanide anion  
 (c) Inhibits by both carbon monoxide and cyanide anion  
 (d) Does not affected by carbon monoxide and cyanide anion

19. Consider the correct reaction among the following,
- (A)  $2\text{HF} + \text{SbF}_5 \longrightarrow [\text{H}_2\text{F}]^+ + [\text{SbF}_6]^-$   
 (B)  $\text{NOF} + \text{ClF}_3 \longrightarrow [\text{NO}]^+ + [\text{ClF}_4]^-$   
 (C)  $\text{PtF}_5 + \text{ClF}_3 \longrightarrow [\text{ClF}_4]^- + [\text{PtF}_4]^+$
- The correct option is  
 (a) A and B                      (b) A and C                      (c) B and C                      (d) A, B and C
20. Choose the correct order of ionization energy for following species  
 (a)  $\text{Sc} > \text{La} > \text{Y}$                       (b)  $\text{Sc} > \text{Y} = \text{La}$                       (c)  $\text{Sc} > \text{Y} > \text{La}$                       (d)  $\text{Sc} < \text{Y} > \text{La}$
21. The Lande g-factor for the  $^3\text{D}_2$  level of an atom is  
 (a)  $1/2$                       (b)  $7/6$                       (c)  $5/2$                       (d)  $7/2$
22. Two spherical nuclei have mass numbers 125 and 64 with their radii  $R_1$  and  $R_2$  respectively. The ratio  $R_1/R_2$  is  
 (a) 2.25                      (b) 1.25                      (c) 2                      (d) 1.5
23. What will the correct number of Mössbauer lines for the  $\text{K}_4[\text{Fe}(\text{CN})_6]$  in the absence and presence of external magnetic field respectively.  
 (a) one and two                      (b) one and six                      (c) six and one                      (d) two and six
24. The ESR spectrum of  $\text{CD}_3$  radical and Benzene radical ( $\text{C}_6\text{H}_6^{\bullet}$ ) will show  
 (a) same number of lines with same intensity ratio  
 (b) same number of lines with different intensity ratio  
 (c) different number of line with different intensity ratio  
 (d) different number of line with same magnetic field
25. The ion (I)  $\text{CrO}_4^{2-}$ , (II)  $\text{MnO}_4^{2-}$ , (III)  $\text{FeO}_4^{2-}$   
 The charge transfer energy for the complexes and type of transition respectively are  
 (a)  $\text{I} > \text{II} > \text{III}$  and MLCT                      (b)  $\text{III} > \text{II} > \text{I}$  and LMCT  
 (c)  $\text{III} > \text{II} > \text{I}$  and MLCT                      (d)  $\text{I} > \text{II} > \text{III}$  and LMCT
26. Determine ground state terms for the following configuration  
 (A)  $d^8$  (Oh symmetry)                      (B)  $d^9$  ( $\text{D}_{4h}$  symmetry, square planar)  
 (a)  $\text{A} = ^3\text{F}_2, \text{B} = ^2\text{D}_{3/2}$                       (b)  $\text{A} = ^3\text{F}_4, \text{B} = ^2\text{D}_{5/2}$   
 (c)  $\text{A} = ^1\text{F}_4, \text{B} = ^1\text{D}_{5/2}$                       (d)  $\text{A} = ^2\text{D}_{5/2}, \text{B} = ^3\text{F}_4$
27. Predict the product (equimolar mixtures)
- $[\text{Pt}(\text{CO})\text{Cl}_3]^- + \text{NH}_3 \longrightarrow \text{A}$   
 $[\text{Pt}(\text{C}_2\text{H}_4)\text{Cl}_3]^- + \text{NH}_3 \longrightarrow \text{B}$
- (a) (A)  $\text{cis}[\text{Pt}(\text{CO})(\text{NH}_3)\text{Cl}_2]$                       (b) (A)  $\text{trans}[\text{Pt}(\text{CO})(\text{NH}_3)\text{Cl}_2]$   
 (B)  $\text{trans}[\text{Pt}(\text{C}_2\text{H}_4)(\text{NH}_3)\text{Cl}_2]$                       (B)  $\text{trans}[\text{Pt}(\text{C}_2\text{H}_4)(\text{NH}_3)\text{Cl}_2]$   
 (c) (A)  $\text{cis}[\text{Pt}(\text{CO})(\text{NH}_3)\text{Cl}_2]$                       (d) (A)  $\text{trans}[\text{Pt}(\text{CO})(\text{NH}_3)\text{Cl}_2]$   
 (B)  $\text{cis}[\text{Pt}(\text{C}_2\text{H}_4)(\text{NH}_3)\text{Cl}_2]$                       (B)  $\text{cis}[\text{Pt}(\text{C}_2\text{H}_4)(\text{NH}_3)\text{Cl}_2]$

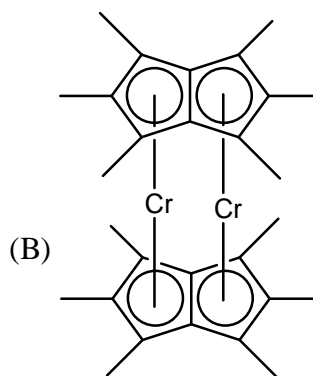
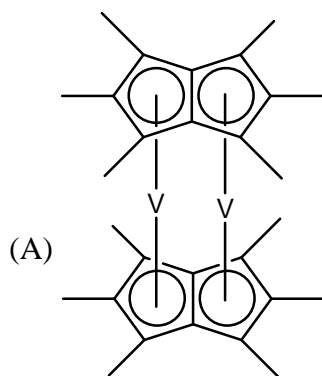
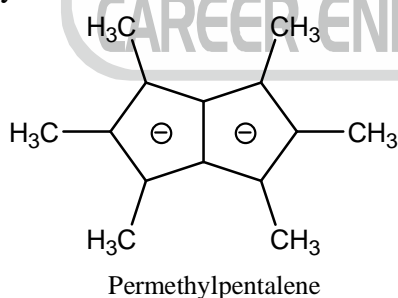
28. The acidity of oxyfluoride follow the order  
 (a)  $\text{XeO}_2\text{F}_4 > \text{XeF}_6 > \text{XeO}_3\text{F}_2 > \text{XeOF}_4$       (b)  $\text{XeO}_3\text{F}_2 > \text{XeO}_2\text{F}_4 > \text{XeOF}_4 > \text{XeF}_6$   
 (c)  $\text{XeF}_6 > \text{XeO}_3\text{F}_2 > \text{XeOF}_4 > \text{XeO}_2\text{F}_4$       (d)  $\text{XeF}_6 > \text{XeO}_2\text{F}_4 > \text{XeO}_3\text{F}_2 > \text{XeOF}_4$
29. The reaction  $[\text{Cr}(\text{NH}_3)_5\text{Cl}]^{2+} + \text{NH}_3 \longrightarrow [\text{Cr}(\text{NH}_3)_6]^{3+} + \text{Cl}^-$  in liq.  $\text{NH}_3$  is catalysed by  
 (a)  $\text{H}_2\text{O}$       (b)  $\text{KNH}_2$       (c)  $\text{H}_2\text{O}_2$       (d)  $\text{HF}$
30. The isolobal organometallic fragment of neutral hydrocarbon  $\text{CH}_2$  for  
 (a)  $\text{Fe}(\text{CO})_4$       (b)  $[\text{Co}(\text{CO})_4]^+$       (c)  $\text{CpCo}(\text{CO})$       (d) all are correct

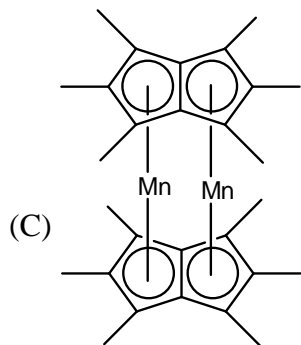
### PART – C

31. The correct sequence of mechanistic steps for reaction given below



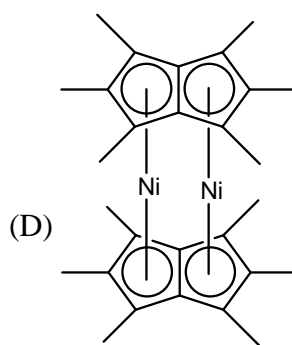
- (a) (A)  $\text{PPh}_3$  dissociation, (B) oxidative addition of allyl chloride, (C) hapticity changes as allyl from  $\eta^1$  to  $\eta^3$ , (D)  $\text{PPh}_3$  dissociation.  
 (b) (A)  $\text{PPh}_3$  dissociation, (B) oxidative addition of allyl chloride, (C)  $\text{PPh}_3$  dissociation, (D) hapticity change of allyl from  $\eta^1$  to  $\eta^3$   
 (c) (A) Oxidative addition of allyl chloride, (B)  $\text{PPh}_3$  dissociation, (C) hapticity change of allyl from  $\eta^1$  to  $\eta^3$ , (D)  $\text{PPh}_3$  dissociation.  
 (d) (A) oxidative addition allyl chloride, (B)  $\text{PPh}_3$  dissociation, (C)  $\text{PPh}_3$  dissociation, (D) hapticity change of allyl from  $\eta^1$  to  $\eta^3$
32. Permethylpentalene is a dianionic ligands and forms bimetallic complexes with transition metals. Find out the number of metal-metal bonds in compound A  $\rightarrow$  D; respectively given that ligand utilizes its maximum hapticity and all compounds obey 18 electron rule.





(a) 3, 2, 0, 1

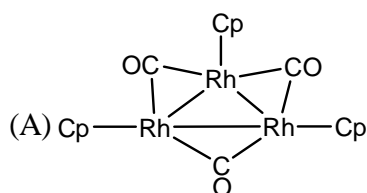
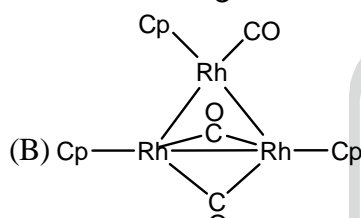
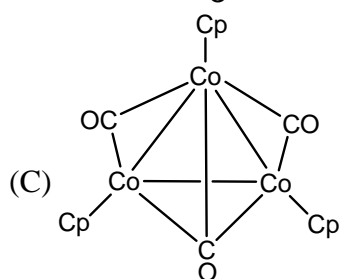
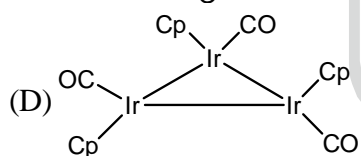
(b) 1, 0, 3, 2



(c) 3, 2, 1, 0

(d) 0, 1, 2, 3

33. Match List-A with List-B

**List-A (Trimetallic carbonyl complex)****List-B ( $\nu_{C-O}$  stretching)**(I) 1833, 1775, 1673  $\text{cm}^{-1}$ (II) 1827, 1783, 1766  $\text{cm}^{-1}$ (III) 1960, 1918  $\text{cm}^{-1}$ (IV) 1935, 1975, 1653  $\text{cm}^{-1}$ (V) 1973, 1827, 1794, 1744  $\text{cm}^{-1}$ 

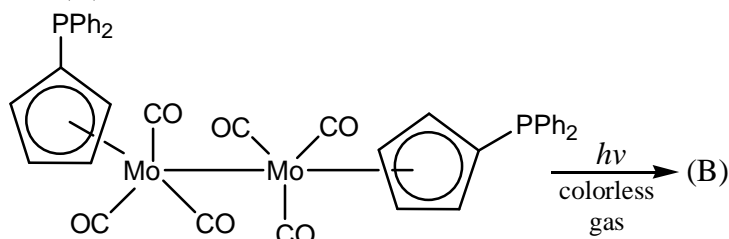
(a) A-II, B-V, C-IV, D-III

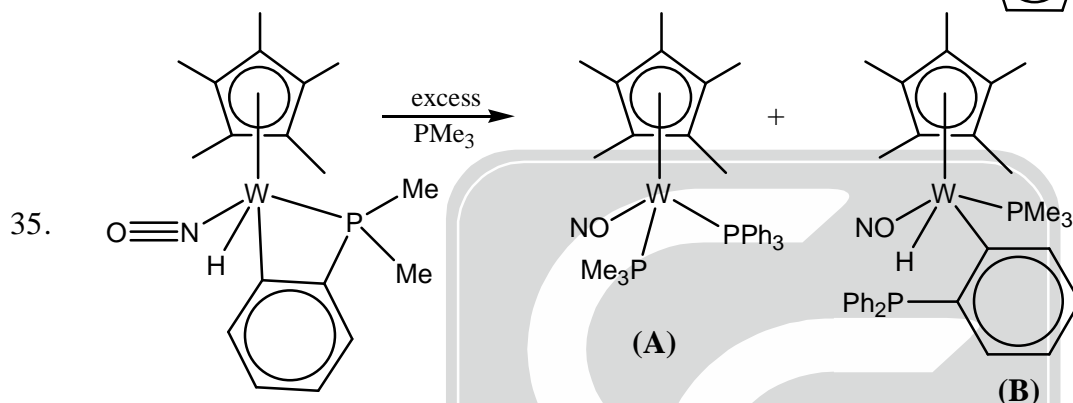
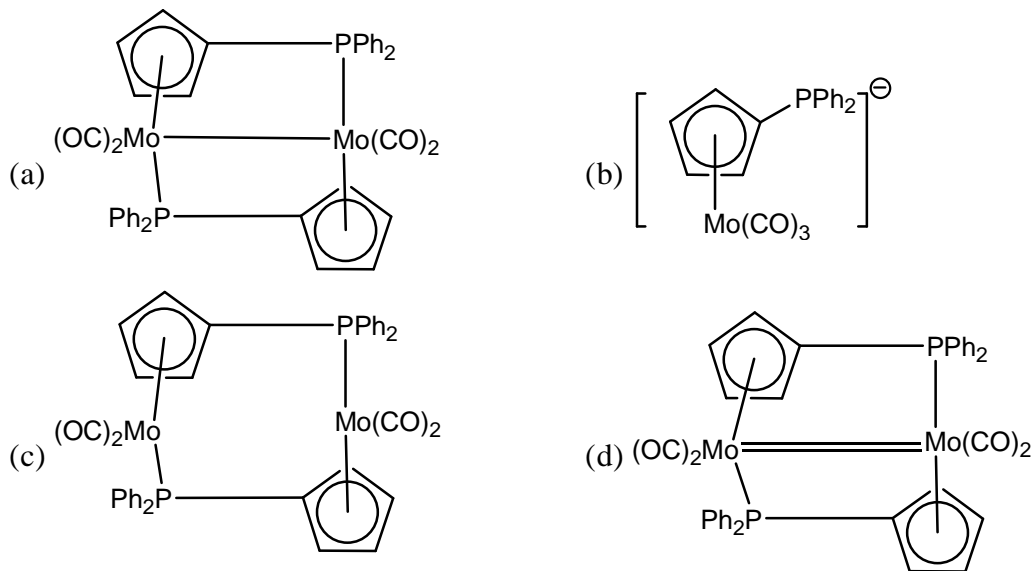
(b) A-II, B-V, C-1, D-III

(c) A-V, B-II, C-III, D-I

(d) A-I, B-II, C-III, D-IV

34. The Mo compound (A) under UV irradiation liberates two moles of a gas giving a new compound (B). The  $^{31}\text{P}$  NMR spectra of compound (A), gave a singlet at  $-17.0$  ppm while for (B) singlet was observed at  $+68.2$  ppm. The  $\nu_{C-O}$  stretching frequency of both A and B were found to be in the range of  $1896$  to  $1959$   $\text{cm}^{-1}$ . Given that both (A) and (B) obey 18 electron rule and (B) has a symmetrical structure. The most probable structure of (B) is





In the above reaction the products (A) and (B) are an example of

- (a) A = oxidative addition, (B) = Reductive elimination  
 (b) A = reductive elimination, (B) = Phosphine substitutions  
 (c) A and B both are an example of reductive elimination  
 (d) A = phosphine substitution, B = reductive elimination
36. Pair of molecules having same number of lone pair on central atom  
 (A)  $\text{XeF}_2$  and  $\text{I}_3^-$       (B)  $\text{SF}_4$  and  $[\text{ClF}_4]^+$       (C)  $\text{NO}_3^-$  and  $\text{SO}_3^{2-}$       (D)  $\text{ClO}_4^-$  and  $\text{PO}_4^{3-}$   
 (a) A, B, C      (b) A, B, D      (c) B, C, D      (d) B and D
37. Correct statement regarding lanthanoids is  
 (a) Metal ligand bonding is predominantly covalent  
 (b) Lanthanoids complexes are generally low spin complexes  
 (c) Colour of  $\text{Ln}^{3+}$  ions is generally less intense than  $\text{An}^{3+}$  ions.  
 (d)  $\text{Ce}^{3+}$  and  $\text{Eu}^{3+}$  are colourless in aqueous medium.
38. Identify the correct statement(s) among following  
 (I) Both haemoglobin and cytochrome contain haem group  
 (II) Cytochrome-c oxidase contain one metal  
 (III) Each sub-unit in deoxyhaemoglobin contains 5-coordinate Fe(II), but in cytochrome-c, the Fe centre is always 6-coordinate  
 (IV) Cytochrome-c be a useful oxygen carrier  
 (a) I and II      (b) I and III      (c) II and IV      (d) II, III and IV

39. Match the item in **Column-A** with appropriate item in **Column-B**

**Column-A**

- (P) Vitamin B<sub>12</sub>  
 (Q) Cytochrome P<sub>450</sub>  
 (R) Plastocyanin  
 (S) Valinomycin

**Column-B**

- (I) Ionophores  
 (II) Electron transfer  
 (III) Iron storage  
 (IV) Group transfer reaction and cobalt  
 (V) Oxidative of alkene  
 (VI) Cystein rich protein  
 (b) P-V, Q-VI, R-II, S-I  
 (d) P-IV, Q-V, R-II, S-I

(a) P-IV, Q-II, R-I, S-VI

(c) P-II, Q-IV, R-VI, S-III

40. Identify the correct statements among the following

- (I) The ferredoxin [4Fe-4S] resemble [3Fe-4S] but contain one additional FeS (cys) group which complete the approximately cubic cluster core  
 (II) Molybdoenzyme can both oxidise and reduce the substrate because Mo(VI) is more stable than Mo(IV)  
 (III) *Au* is used in treatment of Arthritis while *Li* in maniac depression  
 (IV) In vitro reaction of O<sub>2</sub>(excess) with free haem B in aqueous medium give haem B(O<sub>2</sub>) as end product.

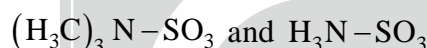
(a) I and II

(b) I, II and III

(c) III and IV

(d) I and III

41. The most appropriate statement for the donor acceptor complexes



in gas phase

(a)  $(\text{H}_3\text{C})_3\text{N}-\text{SO}_3$  has longer N-S bond

(b)  $\text{H}_3\text{N}-\text{SO}_3$  has shorter N-S bond

(c)  $(\text{H}_3\text{C})_3\text{N}-\text{SO}_3$  has shorter N-S bond and longer N-S-O bond angle

(d)  $\text{H}_3\text{N}-\text{SO}_3$  has shorter N-S bond and shorter N-S-O bond angle

42. s-block metal get dissolve in liquid ammonia, the special characteristics of liq. NH<sub>3</sub> are

(I) They act as good reducing agent and show metallic lustre

(II) If pure on evaporation metal get back if impure then on evaporation first group metal form amide

(III) On increasing concentration above 3 molarity paramagnetic character increases and colour become bronze.

The correct characteristic are

(a) I

(b) I and II

(c) I and III

(d) II and III

43. The correct statement among following

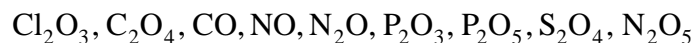
(a) The chelate effect is predominantly due to enthalpy change

(b) The complex  $[\text{Cu}(\text{1, 10 phenanthroline})_2]^+$  show paramagnetic behaviour.

(c)  $\text{MnCr}_2\text{O}_4$  is likely to have inverse spinel structure because  $\text{Cr}^{3+}$  will have a LFSE in the octahedral site where as the  $\text{Mn}^{2+}$  will not.

(d) The  $\mu_{\text{eff}}$  of  $[\text{Fe}(\text{S}_2(\text{NEt}_2)_3)]$  changes with temperature with the involvement of two electronic states. The states are low spin  ${}^2\text{T}_{2g}$  and high spin  ${}^6\text{A}_{1g}$ .

44. Among the following the number of anhydrides of acid are



(a) 6

(b) 7

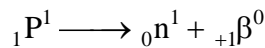
(c) 8

(d) 9





45. The correct statement(s) is/are  
 (I) The number of P-S and P-P bond in compound  $P_4S_3$  are 6 and 3 respectively  
 (II) The final product(s) of the reaction  $P(OR)_3 + R'X$  are  $R'P(O)(OR)_2$  and  $RX$   
 (III) The general formula of phyllosilicate is  $[Si_2O_5]^{2-}$  and its example is muscovite mica  
 (IV) The general formula of peroxoborate is  $[B_2(O_2)_2(OH)_4]^{2-}$   
 (a) I and II (b) II and III (c) III and IV (d) All are correct
46. The half-life of  $UX_1$  is 24.1 days. How many days after  $UX_1$  has isolated, will it take for 90% of it to change to  $UX_2$   
 (a) 80 days (b) 60 days (c) 30 days (d) 45 days
47. Which ones of the following statements are true for atom having following reaction in its nucleus



- (a) Its mass number increase by 1 (b) Its isotope is formed  
 (c) Its neutron number decrease by 1 (d) Its atomic number decreases by 1
48. In AAS the temperature of the flame explained by Boltzmann distribution equatin. The correct expression for this equation is

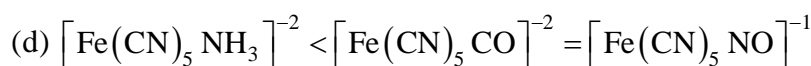
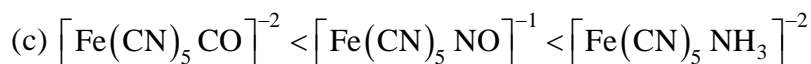
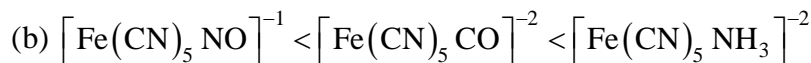
(a)  $\frac{N_J}{N_0} = \frac{P_J}{P_0} \exp\left(-\frac{E_J}{kT}\right)$  {  $P_J$  and  $P_0$  are degeneracy }

(b)  $\frac{N_J}{N_0} = \frac{P_J}{P_0} \exp\left(-\frac{E_J}{k_B T}\right)$  {  $P_J$  and  $P_0$  are statistical factor }

(c)  $\frac{N_J}{N_0} = \frac{h\nu A_T}{P_T} \exp\left(-\frac{E_J}{k_B T}\right)$  {  $A_T$  = Einstein coefficient }

(d)  $\frac{P_J}{N_0} = \frac{N_J A_T}{P_0} e^{\left(-\frac{E_J}{k_B T}\right)}$

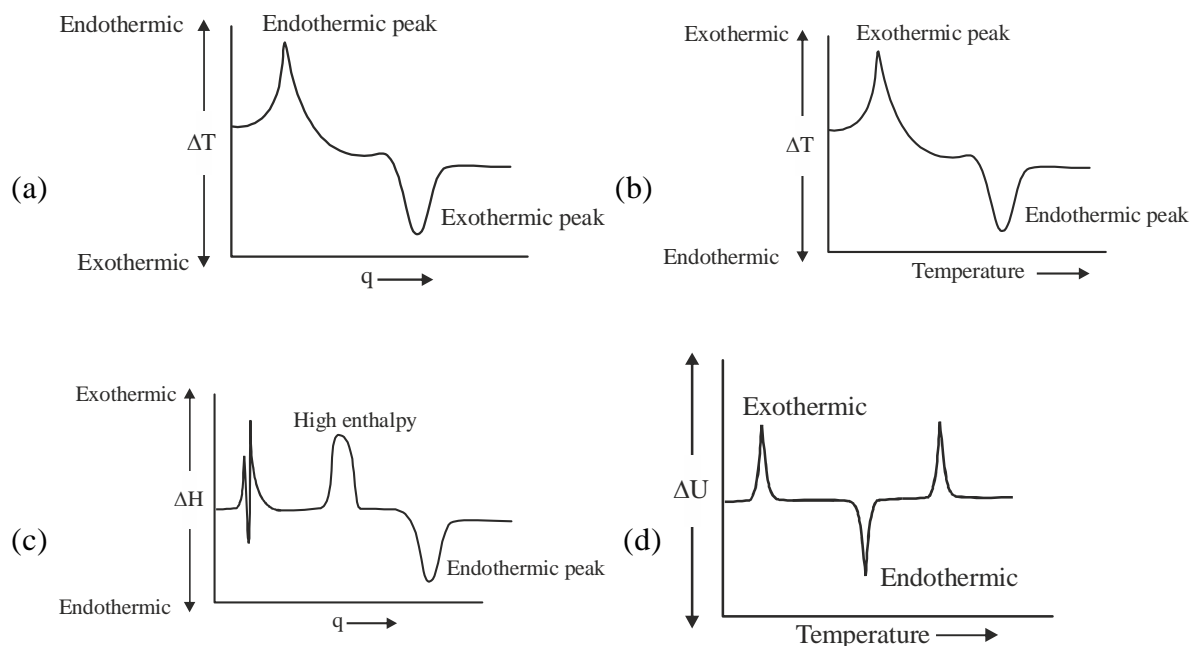
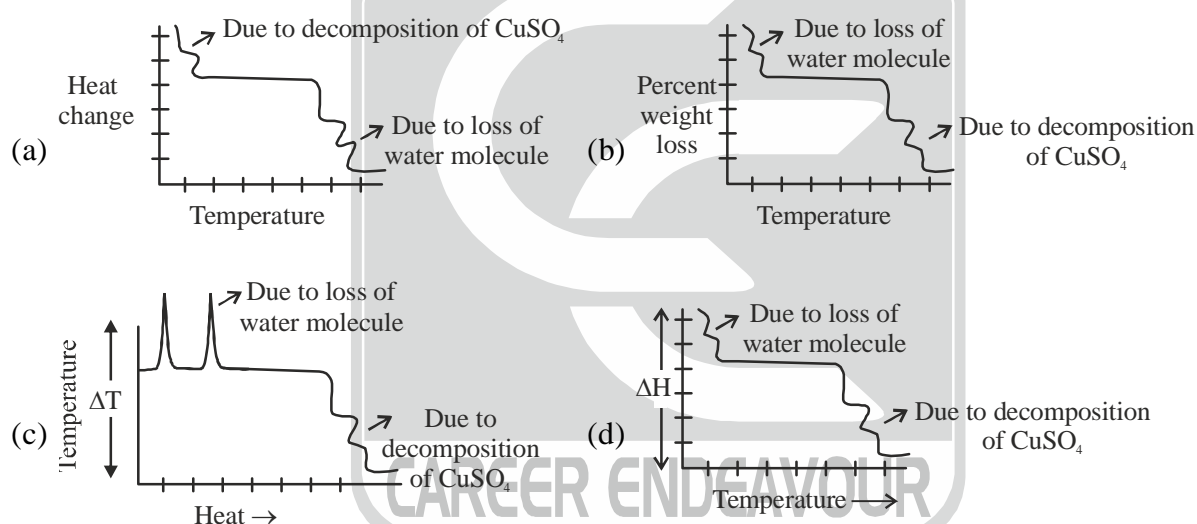
49. The correct order of isomer shift in M.B. spectrum of following iron complexes



50. The correct ESR spectrum for  $NH_2 \cdot$  radical [ $A_N = 10$  mT,  $A_H = 5$  mT]



## 51. Correct representation for differential thermal analysis

52. The correct thermogravimetric curve (TG) for  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$  is53. In  $^{57}\text{Fe}^*$  Mössbauer experiment source of 20.4 keV is moved towards absorber at a velocity of  $4.5 \text{ mms}^{-1}$ . The shift in frequency of the source for this sample (in Hz and  $\text{cm}^{-1}$ ) is

- (a)  $3.97 \times 10^7 \text{ Hz}$ ,  $2.5 \times 10^{-5} \text{ cm}^{-1}$       (b)  $2.46 \times 10^3 \text{ Hz}$ ,  $7.38 \times 10^{-7} \text{ cm}^{-1}$   
 (c)  $7.38 \times 10^7 \text{ Hz}$ ,  $2.46 \times 10^{-3} \text{ cm}^{-1}$       (d)  $4.92 \times 10^7 \text{ Hz}$ ,  $4.5 \times 10^{-3} \text{ cm}^{-1}$

## 54. Identify the correct statement(s) among the following

(I) The colour of s-block element is due to  $ns^1 \leftrightarrow np^1$  transition.

(II) The reactivity of alkali metal in gas and in solution

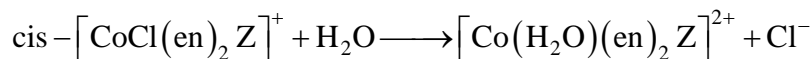
$\text{Li} < \text{Na} < \text{K} < \text{Rb} < \text{Cs}$  and  $\text{Na} < \text{K} < \text{Rb} < \text{Cs} < \text{Li}$  are respectively

(III)  $\text{CaC}_2$ ,  $\text{Be}_2\text{C}$  and  $\text{Mg}_2\text{C}_3$  on hydrolysis form ethyne, methane and propyne respectively

(IV)  $\text{Li} < \text{K} < \text{Na} < \text{Rb} < \text{Cs}$  follow density order

- (a) I and II      (b) II and III      (c) II, III and IV      (d) all are correct

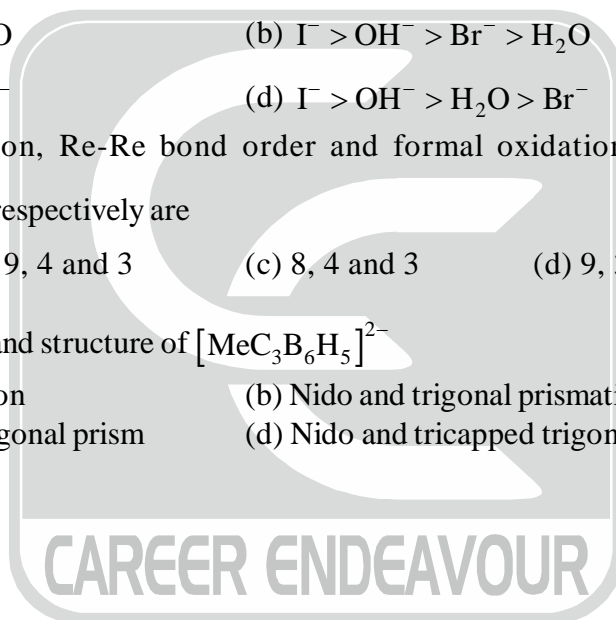
55. Consider the following reaction,



where  $\text{Z} = \text{OH}^-, \text{Cl}^-, \text{NO}_2^-, \text{NCS}^-$

The correct set of Z ligand with respect to % cis-product is

- (a)  $\text{OH}^- > \text{Cl}^- > \text{NCS}^- < \text{NO}_2^-$                       (b)  $\text{NO}_2^- > \text{OH}^- > \text{Cl}^- > \text{NCS}^-$   
 (c)  $\text{OH}^- = \text{Cl}^- = \text{NCS}^- = \text{NO}_2^-$                       (d)  $\text{OH}^- = \text{Cl}^- < \text{NCS}^- = \text{NO}_2^-$
56. A Ni(II) complex having octahedral geometry show absorption band at  $11500 \text{ cm}^{-1}$ . Given spin orbit coupling constant as  $-315 \text{ cm}^{-1}$ , the  $\mu_{\text{eff}}$  (in B.M.) is  
 (a) 2.83                      (b) 3.14                      (c) 3.69                      (d) 4.90
57.  $Z_{\text{eff}}$  for 3d electron in vanadium is  
 (a) 3.30                      (b) 4.30                      (c) 3.90                      (d) 5.20
58. Second order rate constant for reaction between  $[\text{Co}(\text{NH}_3)_5 \text{X}]^{n+}$  and  $[\text{Cr}(\text{H}_2\text{O})_6]^{2+}$  varies with X as (cobalt is in +3 oxidation state)  
 (a)  $\text{I}^- > \text{Br}^- > \text{OH}^- > \text{H}_2\text{O}$                       (b)  $\text{I}^- > \text{OH}^- > \text{Br}^- > \text{H}_2\text{O}$   
 (c)  $\text{I}^- > \text{Br}^- > \text{H}_2\text{O} > \text{OH}^-$                       (d)  $\text{I}^- > \text{OH}^- > \text{H}_2\text{O} > \text{Br}^-$
59. The number of d-electron, Re-Re bond order and formal oxidation state of Re in complex  $[\text{Re}_2 \text{Cl}_4 (\text{PMe}_2\text{Ph})_4]^{2+}$  respectively are  
 (a) 8, 3 and 3                      (b) 9, 4 and 3                      (c) 8, 4 and 3                      (d) 9, 3 and 3
60. Identify the classification and structure of  $[\text{MeC}_3\text{B}_6\text{H}_5]^{2-}$   
 (a) closo and dodecahedron                      (b) Nido and trigonal prismatic  
 (c) closo and tricapped trigonal prism                      (d) Nido and tricapped trigonal prism



*Space for rough work*





## CHEMICAL SCIENCES

Date : 26-05-2018

## TEST SERIES-B

## ANSWER KEY

## PART-A

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

## PART-B

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

## PART-C

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

