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| <b>SUBJECT CODE</b>   | <b>SUBJECT</b>           | <b>PAPER</b>           |  |  |  |  |  |  |  |  |  |  |
| <b>A-02-03</b>  | <b>CHEMICAL SCIENCES</b> | <b>III</b>             |  |  |  |  |  |  |  |  |  |  |
| <b>HALL TICKET NUMBER</b>   |                          |                        |  |  |  |  |  |  |  |  |  |  |
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| <b>QUESTION BOOKLET NUMBER</b>  |                          |                        |  |  |  |  |  |  |  |  |  |  |
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| <b>OMR SHEET NUMBER</b>   |                          |                        |  |  |  |  |  |  |  |  |  |  |
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| <b>DURATION</b>   | <b>MAXIMUM MARKS</b>     | <b>NUMBER OF PAGES</b> |  |  |  |  |  |  |  |  |  |  |
| <b>2 HOUR 30 MINUTES</b>  | <b>150</b>               | <b>16</b>              |  |  |  |  |  |  |  |  |  |  |
| <b>NUMBER OF QUESTIONS</b>  |                          | <b>75</b>              |  |  |  |  |  |  |  |  |  |  |

This is to certify that, the entries made in the above portion are correctly written and verified.

**Candidates Signature**

**Name and Signature of Invigilator**

**Instructions for the Candidates**

- Write your Hall Ticket Number in the space provided on the top of this page.
- This paper consists of seventy five multiple-choice type of questions.
- At the commencement of examination, the question booklet will be given to you. In the first 5 minutes, you are requested to **open the booklet and compulsorily examine it as below** :
  - To have access to the Question Booklet, tear off the paper seal on the edge of this cover page. Do not accept a booklet without sticker-seal and do not accept an open booklet.
  - Tally the number of pages and number of questions in the booklet with the information printed on the cover page. Faulty booklets due to pages/questions missing or duplicate or not in serial order or any other discrepancy should be got replaced immediately by a correct booklet from the invigilator within the period of 5 minutes. Afterwards, neither the Question Booklet will be replaced nor any extra time will be given.**
  - After this verification is over, the Test Booklet Number should be entered in the OMR Sheet and the OMR Sheet Number should be entered on this Test Booklet.
- Each item has four alternative responses marked (A), (B), (C) and (D). You have to darken the circle as indicated below on the correct response against each item.  
**Example:** (A) (B) (C) (D)  
where (C) is the correct response.
- Your responses to the items are to be indicated in the **OMR Answer Sheet given to you**. If you mark at any place other than in the circle in the Answer Sheet, it will not be evaluated.
- Read instructions given inside carefully.
- Rough Work is to be done in the end of this booklet.
- If you write your name or put any mark on any part of the OMR Answer Sheet, except for the space allotted for the relevant entries, which may disclose your identity, you will render yourself liable to disqualification.
- The candidate must handover the OMR Answer Sheet to the invigilators at the end of the examination compulsorily** and must not carry it with you outside the Examination Hall. The candidate is allowed to take away the carbon copy of OMR Sheet and used Question paper booklet at the end of the examination.
- Use only Blue/Black Ball point pen.**
- Use of any calculator or log table etc., is prohibited.**
- There is no negative marks for incorrect answers.**

**అభ్యర్థులకు సూచనలు**

- ఈ పుట పై భాగంలో ఇవ్వబడిన స్థలంలో మీ హాల్ టికెట్ నంబరు రాయండి.
- ఈ ప్రశ్న పత్రము డెబ్బైఐదు బహుళైచ్ఛిక ప్రశ్నలను కలిగి ఉంది.
- పరీక్ష ప్రారంభమున ఈ ప్రశ్నపత్రము మీకు ఇవ్వబడుతుంది. మొదటి ఐదు నిమిషములలో ఈ ప్రశ్నపత్రమును తెరిచి కింద తెలిపిన అంశాలను తప్పనిసరిగా **సరిచూసుకోండి.**
  - ఈ ప్రశ్న పత్రమును చూడడానికి కవర్ పేజీ అంచున ఉన్న కాగితపు సీలును చించండి. స్టిక్కర్ సీలులేని మరియు ఇదివరకే తెరిచి ఉన్న ప్రశ్నపత్రమును మీరు అంగీకరించవద్దు.
  - కవరు పేజీ పై ముద్రించిన సమాచారం ప్రకారం ఈ ప్రశ్నపత్రములోని పేజీల సంఖ్యను మరియు ప్రశ్నల సంఖ్యను సరిచూసుకోండి. పేజీల సంఖ్యకు సంబంధించి గానీ లేదా సూచించిన సంఖ్యలో ప్రశ్నలు లేకపోవుట లేదా నిజప్రతి కాకపోవుట లేదా ప్రశ్నలు క్రమపద్ధతిలో లేకపోవుట లేదా ఏదైనా తేడాలుండుట వంటి దోషపూరితమైన ప్రశ్న పత్రాన్ని వెంటనే మొదటి ఐదు నిమిషాల్లో పరీక్షా పర్యవేక్షకునికి తిరిగి ఇప్పిచేసి దానికి బదులుగా సరిగ్గా ఉన్న ప్రశ్నపత్రాన్ని తీసుకోండి. తదనంతరం ప్రశ్నపత్రము మార్చబడదు అదనపు సమయం ఇవ్వబడదు.
  - పై విధంగా సరిచూసుకొన్న తర్వాత ప్రశ్నపత్రం సంఖ్యను OMR పత్రము పై అదేవిధంగా OMR పత్రము సంఖ్యను ఈ ప్రశ్నపత్రము పైనిర్దిష్టస్థలంలో రాయవలెను.
- ప్రతి ప్రశ్నకు నాలుగు ప్రత్యామ్నాయ ప్రతిస్పందనలు (A), (B), (C) మరియు (D) లుగా ఇవ్వబడ్డాయి. ప్రతిప్రశ్నకు సరైన ప్రతిస్పందనను ఎన్నుకొని కింద తెలిపిన విధంగా OMR పత్రములో ప్రతి ప్రశ్నా సంఖ్యకు ఇవ్వబడిన నాలుగు వృత్తాల్లో సరైన ప్రతిస్పందనను సూచించే వృత్తాన్ని బాల్ పాయింట్ పెన్ తో కింద తెలిపిన విధంగా పూరించాలి.  
**ఉదాహరణ :** (A) (B) (C) (D)  
(C) సరైన ప్రతిస్పందన అయితే
- ప్రశ్నలకు ప్రతిస్పందనలను ఈ ప్రశ్నపత్రముతో ఇవ్వబడిన OMR పత్రము పైన ఇవ్వబడిన వృత్తాల్లోనే పూరించి గుర్తించాలి. అలాకాక సమూహన పత్రంపై వేరొక చోట గుర్తిస్తే మీ ప్రతిస్పందన మూల్యాంకనం చేయబడదు.
- ప్రశ్న పత్రము లోపల ఇచ్చిన సూచనలను జాగ్రత్తగా చదవండి.
- చిత్తుననివి ప్రశ్నపత్రము చివర ఇచ్చిన ఖాళీస్థలములో చేయాలి.
- OMR పత్రము పై నిర్ణీత స్థలంలో సూచించవలసిన వివరాలు తప్పించి ఇతర స్థలంలో మీ గుర్తింపును తెలిపే విధంగా మీ పేరు రాయడం గానీ లేదా ఇతర చిహ్నాలను పెట్టడం గానీ చేసినట్లయితే మీ అసర్వతకు మీరే బాధ్యులవుతారు.
- పరీక్ష పూర్తయిన తర్వాత మీ OMR పత్రాన్ని తప్పనిసరిగా పరీక్ష పర్యవేక్షకుడికి ఇవ్వాలి. వాటిని పరీక్ష గది బయటకు తీసుకువెళ్లకూడదు. పరీక్ష పూర్తయిన తరువాత అభ్యర్థులు ప్రశ్న పత్రాన్ని, OMR పత్రం యొక్క కార్బన్ కాపీని తీసుకువెళ్లనచ్చు.
- నీలి/నల్ల రంగు బాల్ పాయింట్ పెన్ మాత్రమే ఉపయోగించాలి.
- లాగరిథమ్ టేబుల్స్, క్యాలిక్యులేటర్లు, ఎలక్ట్రానిక్ పరికరాలు మొదలగునవి పరీక్ష గదిలో ఉపయోగించడం నిషేధం.
- తప్పు సమాధానాలకు మార్కుల తగ్గింపు లేదు.



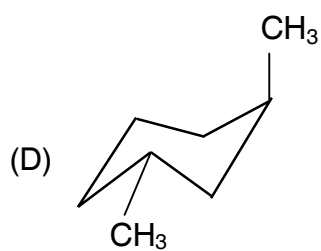
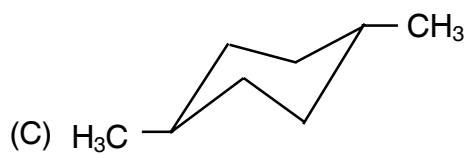
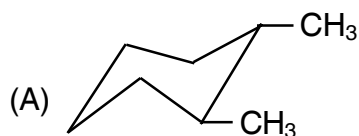
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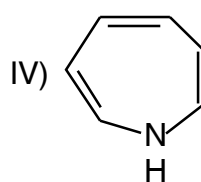
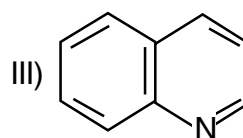
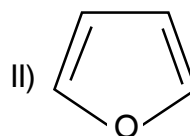
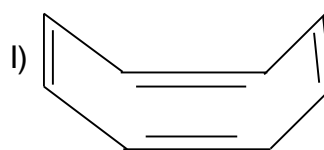
## CHEMICAL SCIENCES

### Paper – III

1. Among the following compounds, the cis-dimethylcyclohexane is



2. Non-aromatic compounds among the following



The correct combination is

(A) III and IV

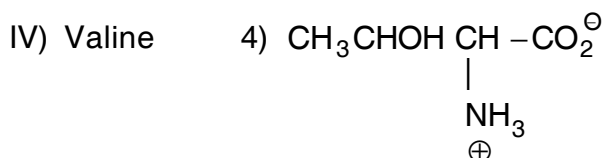
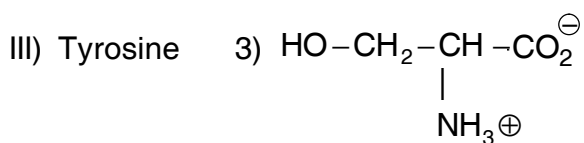
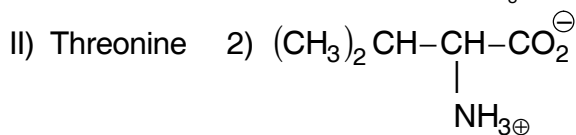
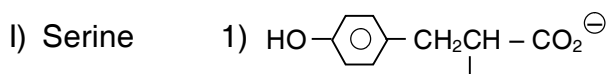
(B) I and IV

(C) II and IV

(D) I and III

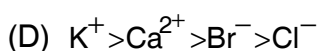
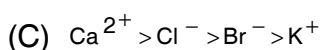
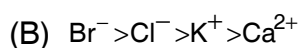
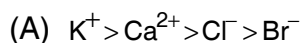


3. Match the following :



|     | I | II | III | IV |
|-----|---|----|-----|----|
| (A) | 4 | 1  | 2   | 3  |
| (B) | 3 | 4  | 1   | 2  |
| (C) | 2 | 1  | 3   | 4  |
| (D) | 4 | 2  | 3   | 1  |

4. The correct order of ionic radii of given ions



5. Assertion (A) :  $[\text{Ni}(\text{H}_2\text{O})_6]^{2+}$  and  $[\text{Ga}(\text{C}_2\text{O}_4)_3]^{3-}$  are labile complexes

Reason (R) : Complexes in which central metal ion has d electrons in  $e_g$  orbitals are labile

(A) Both A and R are true but R is not correct explanation of A

(B) Both A and R are correct and R is the correct explanation of A

(C) A is correct and R is false

(D) A is false and R is correct but not correct explanation of A

6. Which of the following is not correct with respect to substitution reactions in Pt(II) square planar complexes

(A) Ligands that exhibit large trans effect react rapidly

(B)  $\text{SCN}^-$  react more rapidly than  $\text{OH}^-$

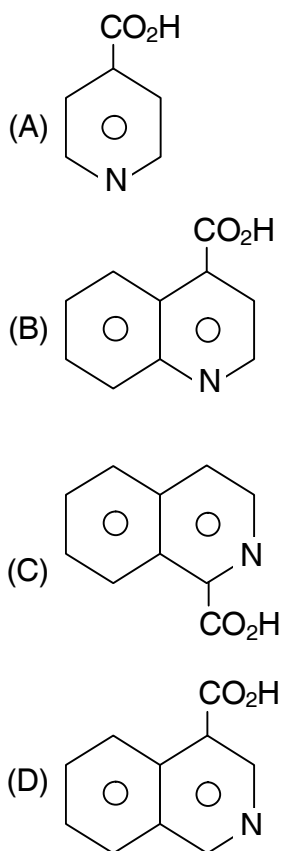
(C) The ligands which are more electro negative react rapidly

(D) Ligands which are easily oxidizable react more rapidly





12. Identify cinchoninic acid from the following structures



13. Match the following

**Selection rule**

| Spin           | Orbital          | Complexion                                  |
|----------------|------------------|---|
| I) allowed     | – allowed        | 1) $[\text{MnCl}(\text{H}_2\text{O})_5]^+$  |
| II) allowed    | – partly allowed | 2) $[\text{Mn}(\text{H}_2\text{O})_6]^{2+}$ |
| III) Forbidden | – partly allowed | 3) $[\text{MnO}_4]^-$                       |
| IV) Forbidden  | – Forbidden      | 4) $[\text{MnBr}_4]^-$                      |

|     | I | II | III | IV |
|-----|---|----|-----|----|
| (A) | 3 | 2  | 1   | 4  |
| (B) | 2 | 1  | 4   | 3  |
| (C) | 3 | 4  | 1   | 2  |
| (D) | 1 | 2  | 4   | 3  |

14.

**Assertion (A) :**  $\text{Eu}^{3+}$  and  $\text{Lu}^{3+}$  are colorless

**Reasoning (R) :** Inner transition elements containing half filled or completely filled f orbitals are colorless

- (A) A is correct but R is false  
 (B) A and R are correct but R is not correct explanation of A  
 (C) A is false and R is correct but R is not correct explanation of A  
 (D) A and R are correct and R is correct explanation of A

15. The organometallic compounds  $\text{W}(\text{C}_5\text{H}_5)_2(\text{CO})_2$  and  $(\text{C}_5\text{H}_5)_2\text{Co}^+$  follow 18 electron rule. The hapticity of the two cyclopentadienyl groups in two compounds respectively are

- (A) 3,3 and 5,5      (B) 3,5 and 3,3  
 (C) 3,5 and 5,5      (D) 2,3 and 3,5

16. Match the following

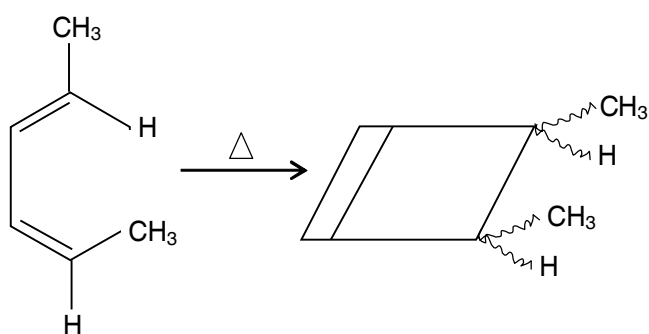
|      | List – I | List – II                                  |
|------|----------|--|
| I)   | Planck   | 1) $6.023 \times 10^{23} \text{ mol}^{-1}$ |
| II)  | Rydberg  | 2) $1.381 \times 10^{-23} \text{ JK}^{-1}$ |
| III) | Boltzman | 3) $1.0974 \times 10^5 \text{ cm}^{-1}$    |
| IV)  | Avagadro | 4) $6.626 \times 10^{-34} \text{ JS}$      |
| V)   | Faraday  |  |

|     | 1   | 2   | 3  | 4  |
|-----|-----|-----|----|----|
| (A) | V   | III | II | I  |
| (B) | IV  | III | II | I  |
| (C) | III | II  | I  | IV |
| (D) | IV  | V   | I  | II |



17. For a reaction  $2A+B \rightarrow \text{products}$ , the active mass of B is kept constant and that A is doubled. The rate of reaction will then
- (A) increase two times  
(B) increase four times  
(C) decrease two times  
(D) decrease four times
18. The potential of hydrogen electrode at  $\text{pH}_{10.0}$  and at  $25^\circ\text{C}$  is
- (A) 0.59 Volt      (B) Zero Volt  
(C) -0.59 Volt      (D) -0.059 Volt
19. Identify the photochemical reaction occurring in human eye
- (A) Photocycloaddition  
(B) Photoreduction  
(C) Photooxidation  
(D) Photochemical Z  $\rightarrow$  E isomerization
20. Name the product of the given pericyclic reaction



- (A) 3, 4 - Dimethyl cyclobutene  
(B) trans - 3, 4 - Dimethyl cyclobutene  
(C) cis - 3,4 - Dimethyl cyclobutene  
(D) cis and trans -3, 4 - Dimethyl cyclobutene

21. The thermal reaction leading to Vitamin D is
- (A) 1, 6 - Sigmatropic rearrangement  
(B) 1, 7 - Sigmatropic rearrangement  
(C) 1, 8 - Sigmatropic rearrangement  
(D) Cycloaddition
22. In  $\text{Re}_2 \text{Cl}_8^{2-}$  the Re - Cl bonds involves in \_\_\_\_\_ hybridization
- (A)  $d \text{Sp}^3$       (B)  $d^2 \text{Sp}^3$   
(C)  $\text{Sp}^3$       (D)  $d \text{Sp}^2$
23. Following reaction belongs to \_\_\_\_ type  
 $\text{I}_r(\text{CO})(\text{PPh}_3)_2\text{Cl} + \text{H}_2 \rightarrow \text{I}_r(\text{CO})(\text{PPh}_3)_2\text{ClH}_2$
- (A) Reductive elimination  
(B) Oxidative addition  
(C) Reduction reaction  
(D) Oxidation reduction
24. Which of the following metal fragments is isolobal with  $\text{CH}_3$  ?
- (A)  $\text{Ni}(\text{CO})_4$       (B)  $\text{Cr}(\text{CO})_5$   
(C)  $\text{Co}(\text{CO})_4$       (D)  $\text{Co}(\text{CO})_3$
25. The phase rule appropriate to a system characterized by the intensive variables temperature and pressure is
- (A)  $F = C - 2P + 2$   
(B)  $F = C - P + 2$   
(C)  $F = C - P + 3$   
(D)  $F = 2C - P + 2$



26. The correct statements among the following are

- 1) The chemical potential of a pure substance is the molar Gibbs energy of the substance
- 2) The chemical potential of a substance is uniform throughout a system at equilibrium
- 3) The chemical potential varies with temperature
- 4) The chemical potential does not vary with pressure

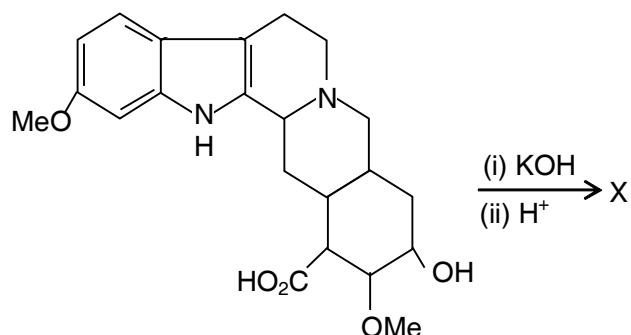
- (A) 2, 3, 4                      (B) 1, 2, 3  
(C) 1, 2, 4                      (D) 1, 3, 4

27. The correct statements among the following are

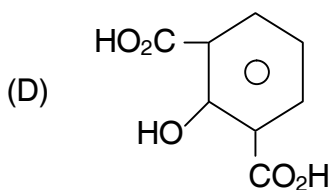
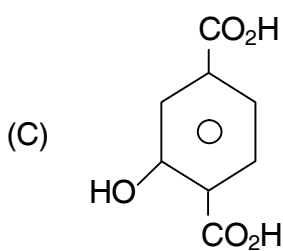
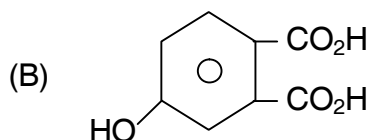
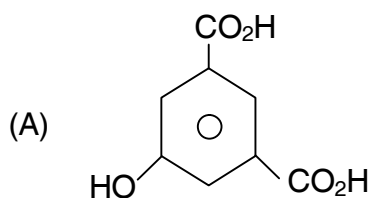
- 1) An acceptable wave function must be continuous
- 2) An acceptable wave function must be single valued
- 3) An acceptable wave function must not be square integrable
- 4) An acceptable wave function must have continuous first derivative

- (A) 1, 2, 4                      (B) 1, 2, 3  
(C) 2, 3, 4                      (D) 1, 3, 4

28. In the following reaction



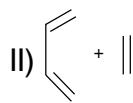
the product X is





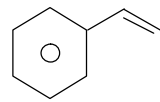


29. Match the following

| Reaction  | Atom economy |
|---|--------------|
| I) $C_2H_5CH_2COOC_2H_5 + CH_3NH_2$   | 1) 35.3%     |
| II)  | 2) 27%       |
| III) $CH_3 - HBr(CH_3) - CH_3 + NaOC_2H_5$  | 3) 40%       |
| IV) Heating of a mixture of $CH_3CH_2CH_2N^+(CH_3)_3$ and $OH^-$                      | 4) 100%      |
|   | 5) 65.4%     |

|     | I | II | III | IV |
|-----|---|----|-----|----|
| (A) | 5 | 4  | 2   | 1  |
| (B) | 4 | 5  | 2   | 1  |
| (C) | 5 | 4  | 1   | 2  |
| (D) | 5 | 4  | 3   | 2  |

30. Match the following

|             |  |
|-------------|--|
| I) PVC      | 1)  |
| II) Teflon  | 2) $CH_2 = CH - Cl$  |
| III) Styron | 3) $CF_2 = CF_2$   |
| IV) PE      | 4) $CH_2 = CH_2$   |
|             | 5) $CH_2 = CCl_2$  |

|     | I | II | III | IV |
|-----|---|----|-----|----|
| (A) | 2 | 5  | 1   | 4  |
| (B) | 2 | 3  | 1   | 4  |
| (C) | 4 | 2  | 3   | 1  |
| (D) | 4 | 1  | 3   | 2  |

31. According to Bent's rule

- 1) More electronegative substituents prefer hybrid orbitals having more S character
  - 2) More electronegative substituents prefer hybrid orbitals having less S character
  - 3) More electropositive substituents prefer hybrid orbitals having more S character
  - 4) More electropositive substituents prefer hybrid orbitals having less S character
- (A) 1 and 2 are correct  
 (B) 2 and 3 are correct  
 (C) 3 and 4 are correct  
 (D) 1 and 4 are correct

32. The correct statements among the following

- 1)  $Na^+$  and Ne are isoelectronic but ionization energy of  $Na^+$  is more than Ne
  - 2)  $Na^+$  and Ne are isoelectronic but ionization energy of Ne is more than  $Na^+$
  - 3)  $O^{2-}$  and  $F^-$  are isoelectronic but  $F^-$  has higher radius than  $O^{2-}$
  - 4)  $O^{2-}$  and  $F^-$  are isoelectronic but  $O^{2-}$  has higher radius than  $F^-$
- (A) 1, 2, 3, 4 are correct  
 (B) 1 and 3 are correct  
 (C) 1 and 4 are correct  
 (D) 2 and 4 are correct

33. The symmetric stretching vibrational mode of  $CO_2$  molecule is

- (A) IR active  
 (B) IR and Raman active  
 (C) IR active but Raman inactive  
 (D) IR inactive but Raman active

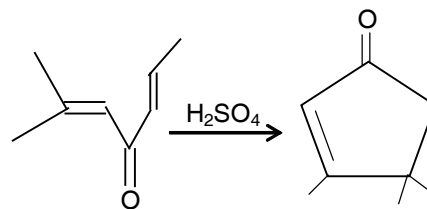


34. The emf of the cell  $\text{Zn}|\text{Zn}^{+2}(1\text{M})||\text{Cu}^{+2}(1\text{M})|\text{Cu}$  is 1.10 V. If the standard potential of  $\text{Zn}|\text{Zn}^{+2}$  is  $-0.78\text{V}$ . What is the oxidation potential of  $\text{Cu}|\text{Cu}^{+2}$  ?
- (A) 1.88 V                      (B)  $-0.34\text{V}$   
(C) 0.34 V                      (D)  $-1.88\text{V}$
35. The relation between  $\Delta E$  and  $\Delta H$  is
- (A)  $\Delta E = \Delta H + P \Delta V$   
(B)  $\Delta E = \Delta H$   
(C)  $\Delta H = \Delta E + P \Delta V$   
(D)  $\Delta H = \Delta E - V \Delta P$
36. For the reaction :  $\text{A} + 2\text{B} \rightarrow \text{C} + \text{D}$ , where rate =  $k\text{A}^2\text{B}^2$
- (A) The reaction is second order overall  
(B) It is termolecular reaction  
(C) If the concentration of A is doubled the reaction velocity doubles  
(D) If both the concentration of A and B are doubled the net result would be no change in reaction in velocity
37. Fluoxetine is used in the treatment of
- (A) Schizophrenia    (B) Depression  
(C) Parkinsonism    (D) Epilepsy
38. Peptic ulcers are treated with
- (A) Omeprazole  
(B) Azelastine  
(C) Astemizole  
(D) Loratidine
39. Which of the following statements regarding the reaction of Boc-Ala with Leu COOMe in presence of DCC to give Boc-Ala-Leu-COO Me is not correct
- (A) Acylation reaction  
(B) Amination reaction  
(C) Peptide bond formation  
(D) Dehydration reaction
40. D-Arabinose on treatment with NaCN followed by hydrolysis mainly gives
- (A) D-Gluconic acid  
(B) D-Guluronic acid  
(C) D-Glucuronic acid  
(D) D-Iduronic acid
41. In mass spectrum of 2-chlorobenzoic acid, the peaks at  $m/z$  157 and 159 are due to
- I) C isotopes  
II) Cl isotopes  
III) Parent ion  
IV) Metastable ion
- The correct combination is
- (A) II and III                      (B) III and I  
(C) I and II                      (D) III and IV
42. Predict the products in the following Arbuzov reaction
- $$\text{P}(\text{OR})_3 + \text{R}'\text{X} \rightarrow ?$$
- (A)  $[\text{R}'\text{PO}(\text{OR})_2]$  and  $\text{R}'\text{X}$   
(B)  $\text{ROR}'$  and  $\text{P}(\text{OR})_2\text{X}$   
(C)  $[\text{R}'\text{RPO}_2(\text{OR})]$   
(D)  $\text{R}'\text{PO}(\text{OR})_2$  and  $\text{RX}$
43. The strongest superacid among the following
- (A)  $\text{SbF}_5$  in HF                      (B)  $\text{SbCl}_3$  in HF  
(C)  $\text{SbF}_5$  in HI                      (D)  $\text{SbCl}_5$  in HI



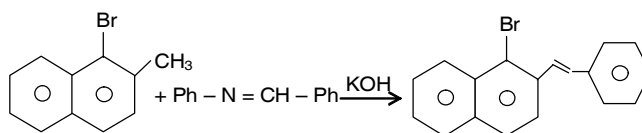
44. A non haem iron containing protein is  
(A) Hemocyanin  
(B) Haemoglobin  
(C) Hemerythrin  
(D) Myoglobin
45. For a first order reaction,  $2A + B \rightarrow C + 2D$  which is first order in A and also first order in B the rate is given by  
(A)  $K[A]^2[B]$  (B)  $K[A][B]^2$   
(C)  $K[A]^2$  (D)  $K[A][B]$
46. Which of the following statements is wrong about lyophobic sols ?  
(A) They exhibit the tyndall effect  
(B) They are not prepared by direct mixing  
(C) They commonly form gels  
(D) They undergo electrophoresis and electro osmosis
47. Which of the following planes diffract X-rays in a FCC system ?  
(A) 100, 110, 111, 200, 210  
(B) 111, 200, 220, 311, 222  
(C) 110, 200, 211, 220, 310  
(D) 111, 220, 210, 311, 400
48. A molecule may be chiral and therefore optically active only if it does not possess  
(A) an axis of improper rotation  
(B) an axis of proper rotation  
(C) a reflection in mirror plane  
(D) an identity operation

49. The following reaction is an example of



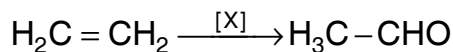
- (A) Neber-Bosset (B) Negishi  
(C) Nenitzescu (D) Nazarov

50. The following reaction is an example of



- (A) Seigrist (B) Shestakov  
(C) Simchen (D) Skattebol

51. Indicate the catalyst [X] of the reaction



- (A) Cu - Mg (B) Zn - Cu  
(C) Pd - Cu (D) Pd - Mg

52. DPPH solid gives single line in EPR whereas in solution the same gives

- (A) Five lines (B) Four lines  
(C) Three lines (D) One line

53. The affinity of haemoglobin for oxygen

- (A) Increases with decreasing pH  
(B) Decreases with decreasing pH  
(C) Decreases with increasing pH  
(D) Does not depend on pH



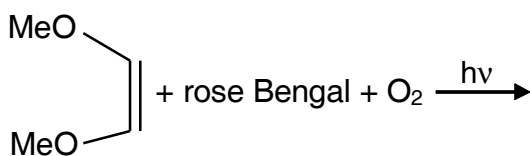
54. Identify the eigen function of the operator  $d/dx$  from the following

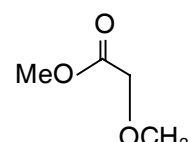
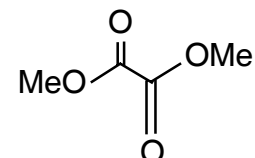
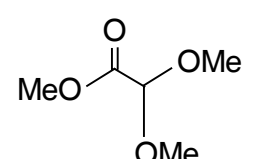
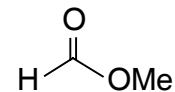
- (A)  $x^2$  (B)  $e^x$   
(C)  $x$  (D)  $x^2 - x$

55. If an arbitrary wave function is used to calculate the energy using variation theory, the value calculated is

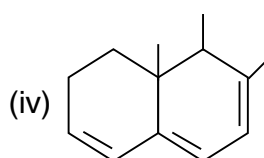
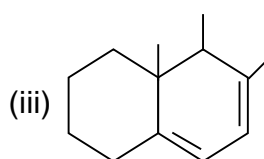
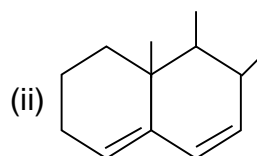
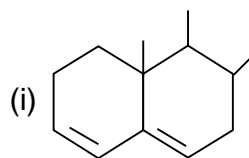
- (A) Never greater than the true energy  
(B) Never less than the true energy  
(C) Always equal to the true energy  
(D) Always equal to zero

56. The major product of the reaction given below is



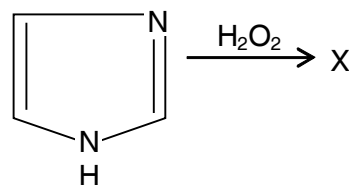
- (A) 
- (B) 
- (C) 
- (D) 

57. Match the following with correct absorption maximum



- (A) (i) – 235 nm; (ii) 282 nm; (iii) 315 nm; (iv) 234 nm  
(B) (i) 282 nm; (ii) 315 nm; (iii) 235 nm; (iv) 234 nm  
(C) (i) 315 nm; (ii) 234 nm; (iii) 235 nm; (iv) 282 nm  
(D) (i) 234 nm; (ii) 235 nm; (iii) 282 nm; (iv) 315 nm

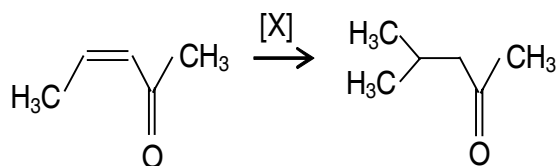
58. What is the major product – X in the following reaction ?



- (A) Oxamide  
(B) Oxalic acid  
(C) Urea  
(D) Ethylene diamine



59. Identify the "X" in the given reaction



- (A) MeMgBr                      (B) MeMgBr/CuI  
(C) MeLi                          (D) MeMgCl

60. Match the following

**Compound**                      **Environmental effect**

- I) Chlorofluorocarbons    1) Greenhouse effect  
II) Hydrocarbons and NO<sub>2</sub> in presence of sunlight    2) Acid rain  
III) CO<sub>2</sub> and H<sub>2</sub>O                      3) Photochemical Smog  
IV) Oxides of sulphur                      4) Ozone depletion

|     | I | II | III | IV |
|-----|---|----|-----|----|
| (A) | 2 | 3  | 4   | 1  |
| (B) | 4 | 1  | 2   | 3  |
| (C) | 4 | 3  | 1   | 2  |
| (D) | 1 | 2  | 4   | 3  |

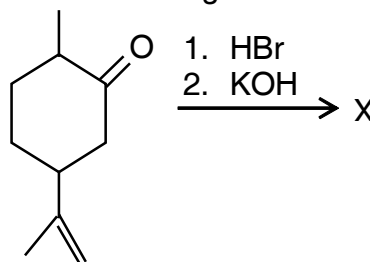
61. Nanomaterials can be synthesized by

- (A) Solvent extraction  
(B) Solid state reactions  
(C) Sol-gel method  
(D) Metathesis reactions

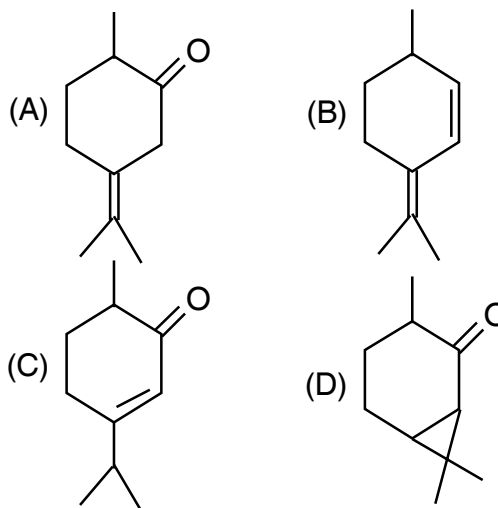
62. <sup>31</sup>P NMR spectrum of PF<sub>5</sub> with rapid intramolecular fluorine exchange shows

- (A) Quartet                      (B) Triplet  
(C) Sextet                        (D) Doublet

63. In the following reaction



the X is



64. Patients suffering from anxiety are treated with

- (A) Alprazolam  
(B) Diphenhydramine  
(C) Glutethimide  
(D) Chlorpromazine

65. Rifampicin is used in the treatment of

- (A) Meningitis  
(B) Sexually transmitted diseases  
(C) Pneumoniae  
(D) Tuberculosis



66. The correct combination of statements regarding dicyclopenta dienyl iron

$[(C_5H_5)^-]_2 Fe^{++}$ , is

- I) Stable molecule
- II) Unstable molecule
- III) Undergoes sulfonation
- IV) Undergoes Friedel-Crafts reaction

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

67. DTA curve of  $CaC_2O_4 \cdot H_2O$  in  $N_2$  atmosphere shows

- (A) Two endothermic and one exothermic peaks
- (B) One endothermic and two exothermic peaks
- (C) Three exothermic peaks
- (D) Three endothermic peaks

68. Match the following

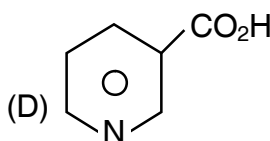
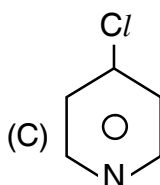
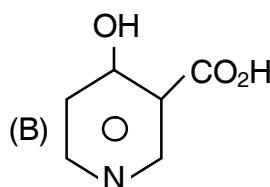
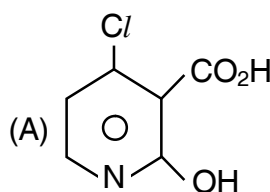
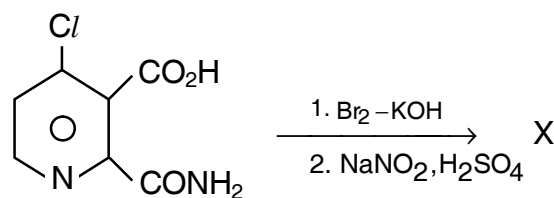
|      | Compound           | Used as                 |
|------|--------------------|-------------------------|
| I)   | Phenolphthalein    | 1) Metal ion indicator  |
| II)  | Diphenylamine      | 2) Acid-base indicator  |
| III) | Fluorescein        | 3) Redox indicator      |
| IV)  | Eriochrome black-T | 4) Adsorption indicator |

|     | I | II | III | IV |
|-----|---|----|-----|----|
| (A) | 2 | 3  | 4   | 1  |
| (B) | 1 | 2  | 3   | 4  |
| (C) | 2 | 4  | 1   | 3  |
| (D) | 3 | 4  | 2   | 1  |

69. The technique in which quantity of electricity is measured to determine the amount of analyte

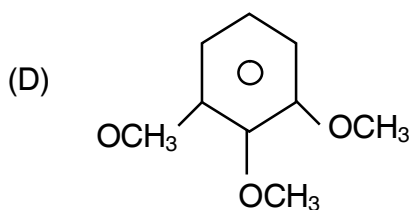
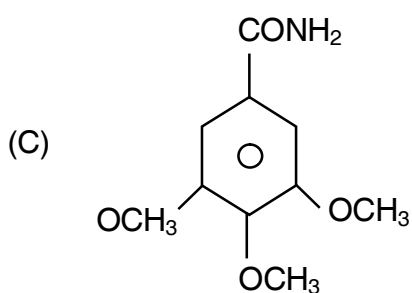
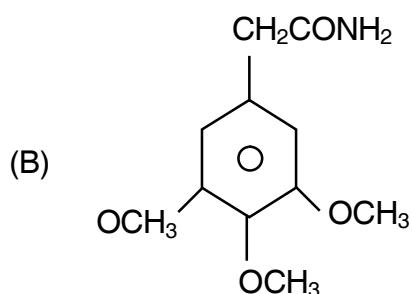
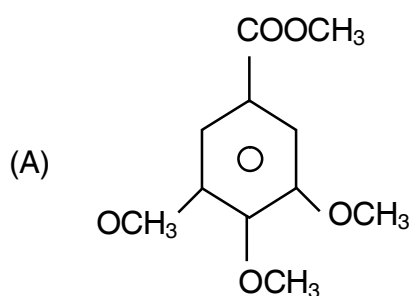
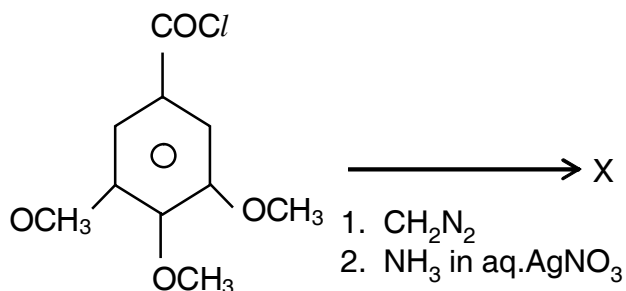
- (A) Polarography
- (B) Electrogravimetry
- (C) Coulometry
- (D) Anodic stripping voltammetry

70. What is 'X' in the following reaction ?





71. What is "X" in the following reaction ?



72. Agent interferes with viral nucleic acid replication is

- (A) Acyclovir
- (B) Mitomycin C
- (C) Folic acid
- (D) Methotrexate

73. Digoxin is

- (A) Cardiac glycoside
- (B) Diuretic
- (C) Antianginal
- (D) Anticholinergic

74. Which of the following is not correct with respect to Mossbauer spectroscopy ?

- (A) Quadrupole splitting is large in  $[\text{Fe}(\text{CN})_5\text{NO}]^{3-}$  than  $[\text{Fe}(\text{CN})_5\text{NH}_3]^{3-}$
- (B)  $[\text{Fe}(\text{CN})_6]^{4-}$  gives two peaks and  $[\text{Fe}(\text{CN})_6]^{3-}$  gives one peak
- (C)  $[\text{Fe}(\text{H}_2\text{O})_6]^{3+}$  gives one peak
- (D)  $\text{Fe}(\text{CO})_5$  gives two peaks

75. Which of the following is not suitable for nuclear fission reactions ?

- (A)  ${}^{235}_{92}\text{U}$
- (B)  ${}^{233}_{92}\text{U}$
- (C)  ${}^{238}_{92}\text{U}$
- (D)  ${}^{239}_{94}\text{Pu}$



Space for Rough Work