KARNATAKA EDUCATION AUTHORITY

(KEA)

COMMON ENTRANCE TEST

KCET 2015

ACTUAL QUESTION PAPER WITH ANSWER KEY

CHEMISTRY

SUBJECT : CHEMISTRY	DAY – 2
SESSION : AFTERNOON	TIME : 02.30 P.M. TO 03.50 P.M.

MAXIMUM MARKS	TOTAL DURATION	MAXIMUM TIME FOR ANSWERING
60	80 MINUTES	70 MINUTES

MENTION YOUR CET NUMBER	QUESTION BOOKLET DETAILS	
	VERSION CODE	SERIAL NUMBER
	A - 1	729873

DOs :

1. Check whether the CET No. has been entered and shaded in the respective circles on the OMR answer sheet.
2. This Question Booklet is issued to you by the invigilator after the **2nd Bell i.e., after 2.30 p.m.**
3. The Serial Number of this question booklet should be entered on the OMR answer sheet.
4. The Version Code of this question booklet should be entered on the OMR answer sheet and the respective circles should also be shaded completely.
5. Compulsorily sign at the bottom portion of the OMR answer sheet in the space provided.

DON'TS :

1. **THE TIMING AND MARKS PRINTED ON THE OMR ANSWER SHEET SHOULD NOT BE DAMAGED / MUTILATED / SPOILED.**
2. The **3rd Bell rings at 2.40 p.m., till then;**
   - Do not remove the paper seal present on the right hand side of this question booklet.
   - Do not look inside this question booklet.
   - Do not start answering on the OMR answer sheet.

IMPORTANT INSTRUCTIONS TO CANDIDATES

1. This question booklet contains 60 questions and each question will have one statement and four distracters. (Four different options / choices.)
2. After the **3rd Bell is rung at 2.40 p.m.,** remove the paper seal on the right hand side of this question booklet and check that this booklet does not have any unprinted or torn or missing pages or items etc., if so, get it replaced by a complete test booklet. Read each item and start answering on the OMR answer sheet.
3. During the subsequent 70 minutes:
   - Read each question carefully.
   - Choose the correct answer from out of the four available distracters (options / choices) given under each question / statement.
   - **Completely darken / shade the relevant circle with a BLUE OR BLACK INK BALL POINT PEN against the question number on the OMR answer sheet.**

Correct Method of shading the circle on the OMR answer sheet is as shown below :

4. Please note that even a minute unintended ink dot on the OMR answer sheet will also be recognised and recorded by the scanner. Therefore, avoid multiple markings of any kind on the OMR answer sheet.
5. Use the space provided on each page of the question booklet for Rough Work. Do not use the OMR answer sheet for the same.
6. After the **last bell is rung at 3.50 p.m.,** stop writing on the OMR answer sheet and affix your LEFT HAND THUMB IMPRESSION on the OMR answer sheet as per the instructions.
7. Hand over the **OMR ANSWER SHEET** to the room invigilator as it is.
8. After separating the top sheet (Our Copy), the invigilator will return the bottom sheet replica (Candidate's copy) to you to carry home for self-evaluation.
9. Preserve the replica of the OMR answer sheet for a minimum period of ONE year.

1. The unit cell with crystallographic dimensions, $a \neq b \neq c$, $\alpha = \gamma = 90$ and $\beta \neq 90$ is

(1) Triclinic (2) Monoclinic

(3) Orthorhombic (4) Tetragonal

2. While charging the lead storage battery, _____.

(1) $PbSO_4$ on anode is reduced to Pb

(2) $PbSO_4$ on cathode is reduced to Pb

(3) $PbSO_4$ on cathode is oxidized to Pb

(4) $PbSO_4$ on anode is oxidized to PbO_2

3. Adenosine is an example of

(1) Nucleotide (2) Purine base

(3) Pyrimidine base (4) Nucleoside

4. Orlon has monomeric unit

(1) Acrolein (2) Glycol

(3) Vinyl cyanide (4) Isoprene

5. The two electrons have the following set of quantum numbers :

$P = 3, 2, -2, +\frac{1}{2}$

$Q = 3, 0, 0, +\frac{1}{2}$

Which of the following statement is true ?

(1) P and Q have same energy

(2) P has greater energy than Q

(3) P has lesser energy than Q

(4) P and Q represent same electron

Space For Rough Work

6. H_2O_2 cannot oxidise

(1) PbS (2) Na_2SO_3

(3) O_3 (4) KI

7. In the given set of reactions,

$$\text{2-Bromopropane} \xrightarrow[\text{alc./heat}]{\text{AgCN}} X \xrightarrow{LiA/H_4} Y$$

the IUPAC name of product 'Y' is

(1) N-Methylpropanamine (2) N-Isopropylmethanamine

(3) Butan-2-amine (4) N-Methylpropan-2-amine

8. On heating with concentrated NaOH solution in an inert atmosphere of CO_2, white phosphorous gives a gas. Which of the following statement is <u>incorrect</u> about the gas ?

(1) It is less basic than NH_3.

(2) It is more basic than NH_3.

(3) It is highly poisonous and has smell like rotten fish.

(4) It's solution in water decomposes in the presence of light.

9. Sodium metal crystallizes in B.C.C. lattice with edge length of 4.29 Å. The radius of sodium atom is

(1) 2.857 Å (2) 1.601 Å

(3) 2.145 Å (4) 1.857 Å

Space For Rough Work

10. 0.06% (w/v) aqueous solution of urea is isotonic with

(1) 0.06% glucose solution
(2) 0.6% glucose solution
(3) 0.01 M glucose solution
(4) 0.1 M glucose solution

11. In a first order reaction, the concentration of the reactant is reduced to 12.5% in one hour. When was it half completed ?

(1) 3 hr
(2) 20 min
(3) 30 min
(4) 15 min

12. The electrolyte having maximum flocculation value for AgI/Ag^+ sol. is

(1) NaCl
(2) Na_2S
(3) Na_2SO_4
(4) Na_3PO_4

13. Copper is extracted from Copper pyrites by heating in a Bessemer converter. The method is based on the principle that

(1) Copper has more affinity for oxygen than Sulphur at high temperature.
(2) Iron has less affinity for oxygen than Sulphur at high temperature.
(3) Copper has less affinity for oxygen than Sulphur at high temperature.
(4) Sulphur has less affinity for oxygen at high temperature.

14. Which of the following will be able to show geometrical isomerism ?

(1) MA_3B – Square planar
(2) MA_2B_2 – Tetrahedral
(3) MABCD – Square planar
(4) MABCD – Tetrahedral

Space For Rough Work

15. The electronic configuration of Gd^{2+} is (at. no. of Gd is 64)

(1) $[Xe]\ 4f^8$ (2) $[Xe]\ 4f^7$

(3) $[Xe]\ 4f^7\ 5d^1\ 6s^2$ (4) $[Xe]\ 4f^7\ 5d^1$

16. $MSO_4 \xrightarrow{NH_4OH} \downarrow \underset{\text{white}}{X} \xrightarrow[\text{excess}]{NH_4OH} Y \xrightarrow{H_2S} \downarrow Z$

Here M and Z are

(1) Cu, ZnS (2) Zn, ZnS

(3) Fe, FeS (4) Al, Al_2S_3

17. The hydrolysis of optically active 2-bromobutane with aqueous NaOH result in the formation of

(1) (+) butan-2-ol (2) (–) butan-2-ol

(3) (±) butan-1-ol (4) (±) butan-2-ol

18. The distinguishing test between methanoic acid and ethanoic acid is

(1) Litmus test (2) Tollen's test

(3) Esterification test (4) Sodium bicarbonate test

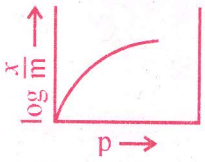
19. In $H_2 - O_2$ fuel cell the reaction occurring at cathode is

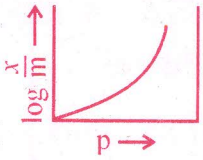
(1) $2H_{2(g)} + O_{2(g)} \longrightarrow 2H_2O_{(l)}$ (2) $O_{2(g)} + 2H_2O_{(l)} + 4e^- \longrightarrow 4\bar{O}H_{(aq)}$

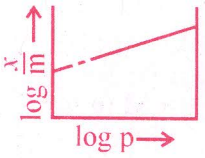
(3) $H^+ + e^- \longrightarrow \frac{1}{2} H_2$ (4) $H^+_{(aq)} + \bar{O}H_{(aq)} \longrightarrow H_2O_{(l)}$

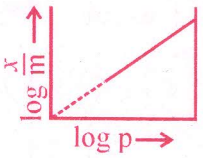
Space For Rough Work

20. Which of the following curve is in accordance with Freundlich adsorption isotherm ?

(1) 

(2) 

(3) 

(4) 

21. How many ions per molecule are produced in the solution when Mohr salt is dissolved in excess of water ?

(1) 4 (2) 5

(3) 6 (4) 10

22. Glycogen is

(1) a polymer of β-D-glucose units

(2) a structural polysaccharide

(3) structurally very much similar to amylopectin

(4) structurally similar to amylopectin but extensively branched

23. Number of possible alkynes with formula C_5H_8 is

(1) 2 (2) 3

(3) 4 (4) 5

Space For Rough Work

24. Which of the following aqueous solution has the highest freezing point ?

(1) 0.1 M Sucrose (2) 0.01 M NaCl

(3) 0.1 M NaCl (4) 0.01 M Na_2SO_4

25. Half life period of a first order reaction is 10 min. Starting with initial concentration 12 M, the rate after 20 min is

(1) 0.0693 M min^{-1} (2) 0.693×3 M min^{-1}

(3) 0.0693×3 M min^{-1} (4) 0.0693×4 M min^{-1}

26. The salt which responds to dilute and concentrated H_2SO_4 is

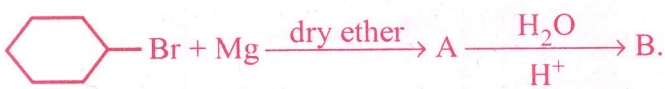
(1) CaF_2 (2) $Ba(NO_3)_2$

(3) Na_2SO_4 (4) Na_3PO_4

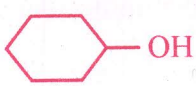
27. On heating potassium permanganate, one of the following compound is not obtained :

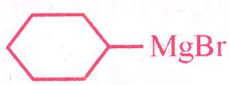
(1) O_2 (2) MnO

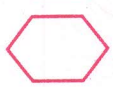
(3) MnO_2 (4) K_2MnO_4

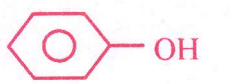
28. 

The product 'B' is

(1) 

(2) 

(3) 

(4) 

Space For Rough Work

29. The formation of cyanohydrin from a ketone is an example of

(1) Nucleophilic substitution
(2) Nucleophilic addition
(3) Electrophilic addition
(4) Electrophilic substitution

30. One of the following is an essential amino acid.

(1) Tyrosine
(2) Cysteine
(3) Isoleucine
(4) Serine

31. The aqueous solution of following salt will have the lowest pH :

(1) $NaClO_3$
(2) $NaClO$
(3) $NaClO_2$
(4) $NaClO_4$

32. For one of the element various successive ionization enthalpies (in kJ mol^{-1}) are given below :

I.E.	1^{st}	2^{nd}	3^{rd}	4^{th}	5^{th}
	577.5	1810	2750	11,580	14,820

The element is

(1) Si
(2) P
(3) Al
(4) Mg

33. 0.30 g of an organic compound containing C, H and Oxygen on combustion yields 0.44 g CO_2 and 0.18 g H_2O. If one mol of compound weighs 60, then molecular formula of the compound is

(1) CH_2O
(2) C_3H_8O
(3) C_4H_6O
(4) $C_2H_4O_2$

Space For Rough Work

34. One of the following amide will not undergo Hoffmann bromamide reaction :

(1) CH_3CONH_2

(2) $CH_3CONHCH_3$

(3) $C_6H_5CONH_2$

(4) $CH_3CH_2CONH_2$

35. Cheilosis and digestive disorders are due to the deficiency of

(1) Thiamine (2) Ascorbic acid

(3) Riboflavin (4) Pyridoxine

36. How many Coulombs of electricity are required for the oxidation of one mol of water to dioxygen ?

(1) 9.65×10^4 C (2) 1.93×10^4 C

(3) 1.93×10^5 C (4) 19.3×10^5 C

37. 100 cm^3 of 1 M CH_3COOH was mixed with 100 cm^3 of 2 M CH_3OH to form an ester. The change in the initial rate if each solution is diluted with equal volume of water would be

(1) 2 times (2) 4 times

(3) 0.5 times (4) 0.25 times

Space For Rough Work

38. Which of the following colloids cannot be easily coagulated ?

(1) Lyophobic colloids

(2) Multimolecular colloids

(3) Macromolecular colloids

(4) Irreversible colloids

39. The complex ion having minimum magnitude of Δ_0(CFSE) is

(1) $[Cr(CN)_6]^{3-}$ (2) $[Co(NH_3)_6]^{3+}$

(3) $[Co(Cl)_6]^{3-}$ (4) $[Cr(H_2O)_6]^{3+}$

40. The arrangement of following compounds :

i. bromomethane

ii. bromoform

iii. chloromethane

iv. dibromomethane

In the increasing order of their boiling point is

(1) iii < i < iv < ii (2) iv < iii < i < ii

(3) ii < iii < i < iv (4) i < ii < iii < iv

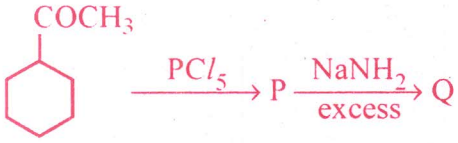
41. Iodoform can be prepared from all, except

(1) propan-2-ol (2) butan-2-one

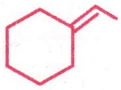
(3) propan-1-ol (4) acetophenone

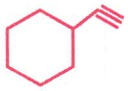
Space For Rough Work

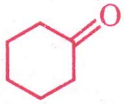
42. Identify 'Q' in the following sequence of reactions :



(1) 

(2) 

(3) 

(4) 

43. Cryolite is

(1) Na_3AlF_6 and is used in the electrolysis of alumina for decreasing electrical conductivity.

(2) Na_3AlF_6 and is used in the electrolysis of alumina for lowering the melting point of alumina only.

(3) Na_3AlF_6 and is used in the electrolysis of alumina for lowering the melting point and increasing the conductivity of alumina.

(4) Na_3AlF_6 and is used in the electrolytic refining of alumina.

44. Which of the following compound of Xenon has pyramidal geometry ?

(1) $XeOF_4$ (2) XeF_2

(3) XeO_3 (4) XeF_4

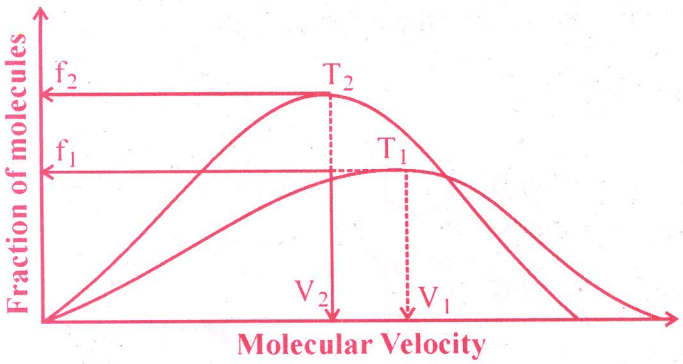
45. After adding non-volatile solute freezing point of water decreases to –0.186 °C. Calculate ΔT_b if $K_f = 1.86$ K kg mol^{-1} and $K_b = 0.521$ K kg mol^{-1}

(1) 0.521 (2) 0.0521

(3) 1.86 (4) 0.0186

Space For Rough Work

46. Plot of Maxwell's distribution of velocities is given below :



Which of the following is correct about this plot ?

(1) $T_1 < T_2$ (2) $f_1 > f_2$

(3) $T_1 > T_2$ (4) $V_1 < V_2$

47. The pair of compound which cannot exist together in solution is

(1) $NaHCO_3$ and NaOH

(2) $NaHCO_3$ and H_2O

(3) $NaHCO_3$ and Na_2CO_3

(4) Na_2CO_3 and NaOH

48. What amount of dioxygen (in gram) contains 1.8×10^{22} molecules ?

(1) 0.0960 (2) 0.960

(3) 9.60 (4) 96.0

Space For Rough Work

49. Using MOT, compare O_2^+ and O_2^- species and choose the incorrect option.

(1) O_2^+ have higher bond order than O_2^-.

(2) O_2^- is less stable.

(3) O_2^+ is diamagnetic while O_2^- is paramagnetic.

(4) Both O_2^+ and O_2^- are paramagnetic.

50. Which of the following is not true ?

(1) Erythromycin is a bacteriostatic antibiotic.

(2) Ampicillin is not a natural antibiotic.

(3) Prontosil is not converted into sulphanilamide in the body.

(4) Vancomycin is a broad spectrum antibiotic.

51. In the reaction

$S + \frac{3}{2} O_2 \longrightarrow SO_3 + 2x$ kJ and $SO_2 + \frac{1}{2} O_2 \longrightarrow SO_3 + y$ kJ

heat of formation of SO_2 is

(1) $x + y$ (2) $x - y$

(3) $2x - y$ (4) $2x + y$

52. Arrange the following compounds in the increasing order of their acidic strength :

i. m-nitrophenol ii. m-cresol

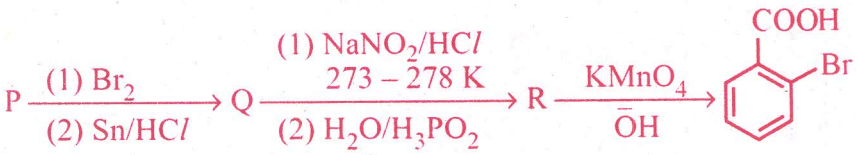
iii. phenol iv. m-chlorophenol

(1) iii < ii < i < iv (2) ii < iv < iii < i

(3) ii < iii < iv < i (4) ii < iii < i < iv

Space For Rough Work

53. In the sequence of following reactions :



the starting compound 'P' is

(1) o-nitro toluene (2) m-nitro toluene

(3) o-bromo toluene (4) p-nitro toluene

54. Acetic acid is treated with $Ca(OH)_2$ and the product so obtained is subjected to dry distillation. The final product is

(1) ethanal (2) propanal

(3) propanone (4) ethanol

55. The correct statement is

(1) BF_3 is the strongest Lewis acid among the other boron halides.

(2) BI_3 is the weakest Lewis acid among the boron halides.

(3) There is maximum $p\pi - p\pi$ back bonding in BF_3.

(4) There is minimum $p\pi - p\pi$ back bonding in BF_3.

56. Which of the following compound possesses the "C – H" bond with the lowest bond dissociation energy ?

(1) Toluene (2) Benzene

(3) n-pentane (4) 2, 2-dimethyl propane

Space For Rough Work

57. In presence of HCl, H_2S results the precipitation of Group-2 elements but not Gp-4 elements during qualitative analysis. It is due to

(1) higher concentration of S^{2-} (2) higher concentration of H^+

(3) lower concentration of S^{2-} (4) lower concentration of H^+

58. One of the following conversion results in the change of hybridization and geometry :

(1) CH_4 to C_2H_6 (2) NH_3 to $\overset{+}{N}H_4$

(3) BF_3 to $B\bar{F}_4$ (4) H_2O to $H_3\overset{+}{O}$

59. Water softening by Clark's process uses

(1) $CaHCO_3$ (2) $NaHCO_3$

(3) Na_2CO_3 (4) $Ca(OH)_2$

60. An alkali metal hydride (NaH) reacts with diborane in 'A' to give a tetrahedral compound 'B' which is extensively used as reducing agent in organic synthesis. The compounds 'A' and 'B' respectively are

(1) C_2H_6 and C_2H_5Na (2) CH_3COCH_3 and $B_3N_3H_6$

(3) C_6H_6 and $NaBH_4$ (4) $(C_2H_5)_2O$ and $NaBH_4$

Space For Rough Work

A-1

Date : 29-MAY-15

COMMON ENTRANCE TEST - 2015

ANSWER KEYS - CHEMISTRY

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51	G
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54	3
55	3
56	1
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58	3
59	4
60	4

Note:

1. G - Indicates One GRACE MARK Awarded for the Question Number.