This Question Paper contains 20 printed pages.
(Part - A & Part - B)

I.No. 0701398

052 (E)

(MARCH, 2020)
SCIENCE STREAM
(CLASS - XII)
(New Course)

Part - A : Time : 1 Hour / Marks : 50
Part - B : Time : 2 Hours / Marks : 50

પ્રશ્ન પેપરનો સેટ નંબર જેની સામેનું વર્તુળ OMR શીટમાં ઘટ્ટ કરવાનું રહે છે.
Set No. of Question Paper, circle against which is to be darken in OMR sheet.

07

(Part - A)

Time : 1 Hour] *[Maximum Marks : 50*

Instructions :

1) There are 50 objective type (M.C.Q.) questions in Part - A and all questions are compulsory.
2) The questions are serially numbered from 1 to 50 and each carries 1 mark.
3) Read each question carefully, select proper alternative and answer in the O.M.R. sheet.
4) The OMR sheet is given for answering the questions. The answer of each question is represented by (A) O, (B) O, (C) O, (D) O. Darken the circle ● of the correct answer with ball-pen.
5) Rough work is to be done in the space provided for this purpose in the Test Booklet only.
6) Set No. of Question Paper printed on the upper-most right side of the Question Paper is to be written in the column provided in the OMR sheet.
7) Use of Simple Calculator and log table is allowed, if required.

1) Which is increasing order of reducing power of the following metals on the basis of standard electrode potential?

$Ag^+/Ag = 0.80V$ $Mg^{2+}/Mg = -2.37V$

$Hg^{2+}/Hg = 0.79V$ $Cr^{3+}/Cr = -0.74V$

(A) $Mg < Cr < Hg < Ag$

(B) $Cr < Mg < Ag < Hg$

(C) $Hg < Ag < Mg < Cr$

(D) $Ag < Hg < Cr < Mg$

Rough Work

Rough Work

2) $\Lambda^{\circ}_{m(HAc)}$ is equal to _____.

(A) $\Lambda^{\circ}_{m(KCl)} + \Lambda^{\circ}_{m(KAc)} - \Lambda^{\circ}_{m(HCl)}$

(B) $\Lambda^{\circ}_{m(HCl)} + \Lambda^{\circ}_{m(NaAc)} - \Lambda^{\circ}_{m(NaCl)}$

(C) $\Lambda^{\circ}_{m(AcH)} + \Lambda^{\circ}_{m(KAc)} + \Lambda^{\circ}_{m(NaAc)}$

(D) $\Lambda^{\circ}_{m(KCl)} + \Lambda^{\circ}_{m(NaAc)} - \Lambda^{\circ}_{m(NaCl)}$

3) While charging the lead storage battery

(A) $PbSO_4$ on cathode changed to PbO

(B) $PbSO_4$ on anode is changed to Pb

(C) $PbSO_4$ on cathode is changed to Pb

(D) $PbSO_4$ on anode changed to PbO_2

4) The decomposition of NH_3 on platinum surface is zero order reaction. What is the rate of production of N_2 if $K = 2.5 \times 10^{-4} mol\ L^{-1}S^{-1}$?

(A) $7.5 \times 10^{-4}\ mol\ L^{-1}S^{-1}$

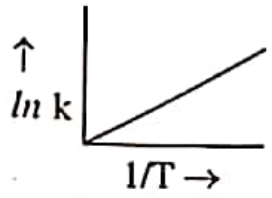
(B) $8.3 \times 10^{-5}\ mol\ L^{-1}S^{-1}$

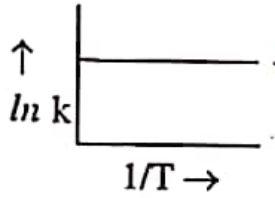
(C) $2.5 \times 10^{-4}\ mol\ L^{-1}S^{-1}$

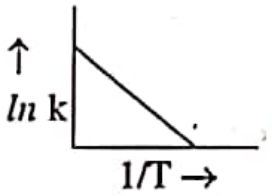
(D) $5 \times 10^{-4}\ mol\ L^{-1}S^{-1}$

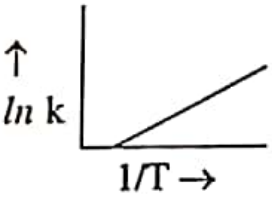
Rough Work

5) Which of the following graph for $ln\,k \rightarrow \frac{1}{T}$ is correct?

(A) 

(B) 

(C) 

(D) 

6) The role of catalyst is to change _____

(A) Equilibrium constant of reaction

(B) Enthalpy of reaction

(C) Gibbs energy of reaction

(D) Activation energy of reaction

7) Extent of adsorption of adsorbate from solution phase increases with _____

(A) decrease in concentration of adsorbate

(B) decrease in temperature

(C) decrease in surface area of the adsorbent

(D) increase in temperature

Rough Work

8) In Haber's Process for manufacture of ammonia which metal acts as a promoter for iron?

(A) Mo

(B) Zn

(C) Cu

(D) As

9) Which of the following electrolytes will have maximum coagulating value for AgI/Ag^+ Sol?

(A) Na_2SO_4

(B) Na_2S

(C) Na_3PO_4

(D) NaCl

10) Which of the following statement is correct about the role of substances added in the froth flotation process?

(A) Depressants mixes different sulphides

(B) Froth stabilizers increases non wettability of gangue

(C) Collectors enhance the non wettability of the ore particle

(D) Water wetted the ore particles

11) Copper matte is the mixture of _____.

(A) Copper (II) sulphide + Iron (I) sulphide

(B) Copper (I) sulphide + Iron (I) sulphide

(C) Copper (II) sulphide + Iron (II) sulphide

(D) Copper (I) sulphide + Iron (II) sulphide

Rough Work

12) Extraction of gold and silver involves leaching the metal with CN^- ion. The metal is later recovered by ____

(A) Roasting

(B) Calcination

(C) Displacement method

(D) Thermal decomposition

13) How many number of σ and π bonds are in cyclotrimeta phosphoric acid molecule respectively?

(A) 14 and 4

(B) 15 and 3

(C) 12 and 6

(D) 16 and 8

14) Which of the following element does not react with oxygen directly?

(A) Pt

(B) Ti

(C) Zn

(D) Fe

15) In equation $XeF_6 + 3H_2O \rightarrow$, Xe containing product is ____.

(A) XeO_2F_2

(B) $XeOF_4$

(C) $XeOF_3$

(D) XeO_3

Rough Work

16) Molecular formula of Tear gas is _____.

(A) $CHCl_2NO_2$

(B) $CCl_2(NO_2)_2$

(C) CCl_3NO_2

(D) $CCl(NO_2)_3$

17) Magnetic moment of a divalent ion in aqueous solution if its atomic number is 25 _____.

(A) 4.90 BM

(B) 5.92 BM

(C) 2.84 BM

(D) 3.87 BM

18) Which of the following is amphoteric oxide?

Mn_2O_7, CrO_3, Cr_2O_3, CrO, V_2O_5, V_2O_4

(A) Mn_2O_7, CrO

(B) CrO_3, V_2O_4

(C) V_2O_5, Cr_2O_3

(D) Cr_2O_3, Mn_2O_7

19) Which of the following element having one electron in 5d orbital in its electronic configuration?

(A) Nd

(B) Tb

(C) Pm

(D) Gd

Rough Work

20) Which of the following is the most stable complex?

(A) $[Fe(C_2O_4)_3]^{3-}$

(B) $[Fe(NH_3)_6]^{3+}$

(C) $[Fe(H_2O)_6]^{3+}$

(D) $[FeCl_6]^{3-}$

21) Molecular formula of Tetraamineaquachlorido cobalt (III) chloride is _____.

(A) $[Co(NH_3)_4(H_2O)]Cl_3$

(B) $[Co(NH_3)_4(H_2O)Cl]Cl_2$

(C) $[Co(NH_3)_4(H_2O)Cl]Cl_3$

(D) $[Co(NH_3)_4(H_2O)Cl]_3Cl_2$

22) Which of the following compound has highest reactivity towards S_N1 reaction?

(A) $C_6H_5CH(C_6H_5)Br$

(B) $C_6H_5CH_2Br$

(C) $C_6H_5C(CH_3)(C_6H_5)Br$

(D) $C_6H_5CH(CH_3)Br$

23) Which of the following has the highest dipole moment?

(A) CCl_4

(B) $CHCl_3$

(C) CH_2Cl_2

(D) CH_3Cl

Rough Work

24) The position of –Br in the compound in $CH_3CH = CHC(Br)(CH_3)_2$ can be classified as _____.

(A) Vinyl

(B) Aryl

(C) benzyl

(D) Allyl

25) The IUPAC name of major organic product of the reaction $CH_3CH_2CH = CH_2 + HBr \xrightarrow{\text{peroxide}}$ is _____.

(A) 1-Bromobutane

(B) 2, 2-Dibromobutane

(C) 1, 2-Dibromobutane

(D) 2-Bromobutane

26) Possible isomers of monohydric phenol having molecular formula C_7H_8O are _____.

(A) 1

(B) 4

(C) 3

(D) 2

27) Phenol $\xrightarrow[273K]{X}$ parabromophenol

In the above reaction reagent 'X' is _____

(A) Bromine water

(B) $Br_2/FeBr_3$

(C) Br_2/CH_3COOH

(D) Br_2/CS_2

28) Which of the following compound has highest boiling point?

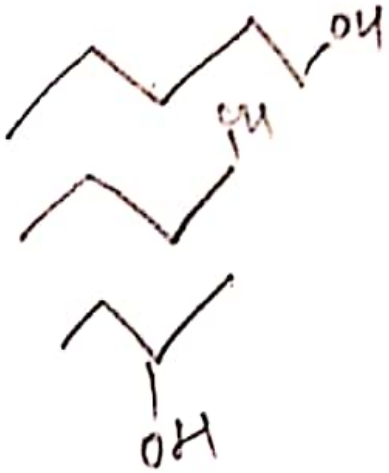
(A) Pentan-1-ol

(B) Butane-1-ol

(C) Butan-2-ol

(D) Propane-1-ol

Rough Work



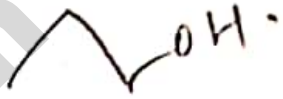
29) Conjugate base of which of the following acid is weak?

(A) $CH_3CH_2CH(I)COOH$

(B) $CH_3CH_2CH(F)COOH$

(C) $CH_3CH_2CH(Br)COOH$

(D) $CH_3CH_2CH(Cl)COOH$



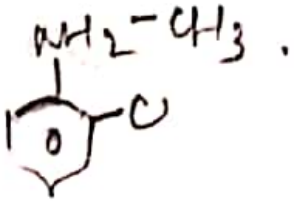
30) Sodium salt of which acid used as food preservative?

(A) Formic acid

(B) Adipic acid

(C) Phthellic acid

(D) Benzoic acid



31) Which of the following compound does not give reaction with Hinsberg's reagent?

(A) N-methyl aniline

(B) Tertiary butyl amine

(C) Triethyl amine

(D) l-methyl cyclohexylamine

Rough Work

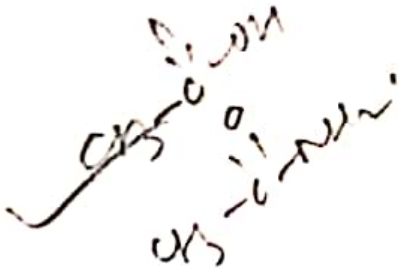
32) _____ compound gives Hoffmann bromamide reaction.

(A) Ethenamide

(B) Ethenoic acid

(C) Ethyl cyanide

(D) Ethenamine



33) The reaction $ArN_2^+Cl^- \xrightarrow{CuI/HCl} ArCl + N_2 + CuCl$ is named as _____.

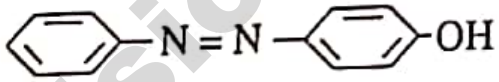
(A) Claisen reaction

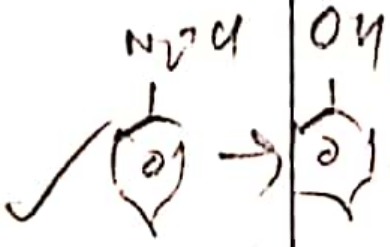
(B) Gatterman reaction

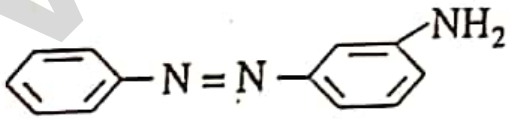
(C) Sandmeyer reaction

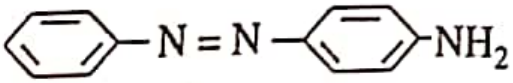
(D) Carbylamine reaction

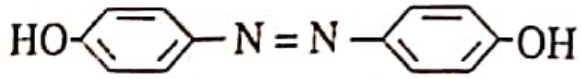
34) Which of the following is structural formula of orange dye?

(A) 



(B) 

(C) 

(D) 

35) _____ vitamin can not be stored in the body.

(A) A

(B) C

(C) D

(D) K

Rough Work

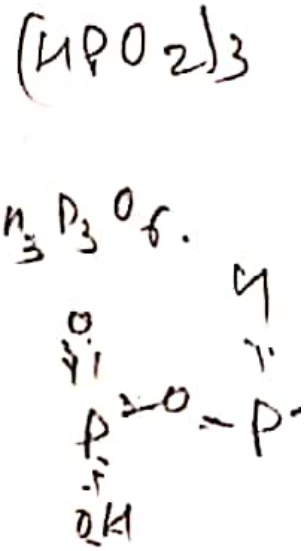
36) Which of the following base is not present in DNA?

(A) Guanine

(B) Adenine

(C) Uracil

(D) Thymine



37) Which of the following pair of protein is globular protein

P-keratin, Q-Insulin, R-myosin, S-albumin

(A) R, S

(B) Q, R

(C) P,R

(D) Q, S

38) Thyroxine is iodinated derivative of which amino acid?

(A) Glutamine

(B) Cysteine

(C) Tyrosine

(D) Tryptophan

39) Which of the following statement is correct?

(A) Nylon 2-Nylon 6 is non biodegradable polymer

(B) Buna-N is a copolymer

(C) Terylene is an addition polymer

(D) Nylon 6 is polyester type of polymer

40) Which are monomers of polymer having structure $(NH–CO–NH–CH_2)_n$?

(A) Urea, Formaldehyde

(B) Acetamide, Methenamine

(C) Acetamide, Formaldehyde

(D) Urea, Ammonia

41) Which is the repeating unit in Neoprene?

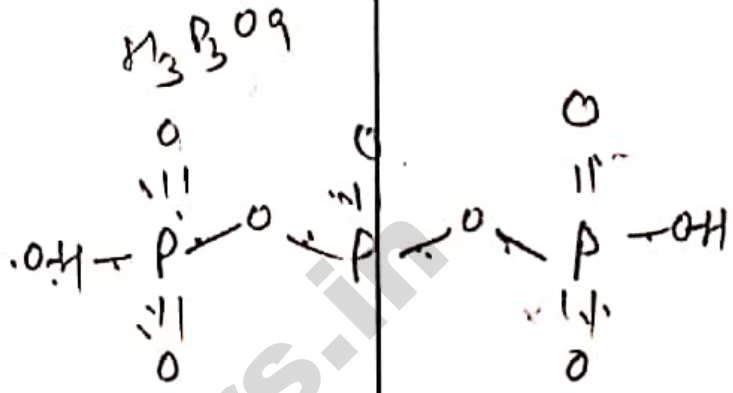
(A) $(CH_2-\overset{Cl}{\overset{|}{C}}=\overset{Cl}{\overset{|}{C}}-CH_2)$

(B) $(\overset{Cl}{\overset{|}{CH}}-CH=CH-CH_2)$

(C) $(CH_2-\overset{CH_3}{\overset{|}{C}}=CH-CH_2)$

(D) $(CH_2-\overset{Cl}{\overset{|}{C}}=CH-CH_2)$

Rough Work



42) Equanil is _____.

(A) Antihistamine

(B) Tranquilizer

(C) Artificial sweetener

(D) Antifertility drug

43) Which of the following solid is very hard electrical insulator in solid as well as in molten state?

(A) Copper

(B) Quartz

(C) Ice

(D) Sodium chloride

Rough Work

44) Atoms of element B form hcp lattice and those of the element A occupy 1/3rd of tetrahedral voids. What is the formula of the compound formed by the elements A and B?

(A) A_3B_2

(B) A_4B_3

(C) A_2B_3

(D) AB

45) Which of the following is an example of orthorhombic crystal?

(A) $BaSO_4$

(B) Na_2SO_4

(C) $CuSO_4$

(D) $CaSO_4$

46) A Ferromagnetic substance becomes a permanent magnet when it is placed in a magnetic field because -

(A) all the domains get oriented in the direction opposite to the direction of magnetic field.

(B) domains are not affected by magnetic field.

(C) domains get oriented randomly.

(D) all the domains get oriented in the direction of magnetic field.

47) Molality of 30% w/w aqueous solution of NaOH is -

(A) 7.5 m

(B) 8.32 m

(C) 10.71 m

(D) 9.17 m

48) Which of the following is an example of a solid solution in which solute is a gas?

(A) Solution of hydrogen in palladium

(B) Camphor in nitrogen gas

(C) Amalgam of mercury with sodium

(D) Oxygen dissolved in water

Rough Work

49) We have three aqueous solutions of NaCl labelled 'A' 'B' and 'C' with concentrations 0.1M, 0.01M and 0.001M respectively. The value of Van't Hoff factor for these solution will be in the order _____

(A) $i_A > i_C > i_B$

(B) $i_C > i_B > i_A$

(C) $i_C = i_B = i_A$

(D) $i_B > i_A > i_C$

50) An electrochemical cell can behave like an electrolytic cell when _____

(A) $E_{cell} = E_{ext.}$

(B) $E_{cell} > E_{ext.}$

(C) $E_{cell} < E_{ext.}$

(D) $E_{cell} = 0$

052 (E)

(MARCH, 2020)
SCIENCE STREAM
(CLASS - XII)
(New Course)

(Part - B)

Time : 2 Hours] *[Maximum Marks : 50*

Instructions :

1) Write in a clear legible handwriting.
2) There are three sections in Part - B of the question paper and total 1 to 18 questions are there.
3) All the questions are compulsory. Internal options are given.
4) The numbers at right side represent the marks of the question.
5) Start new section on new page.
6) Maintain sequence.
7) Use of Simple Calculator and log table is allowed, if required.

SECTION - A

■ **Answer the following Q.No. 1-8 in brief. 2 marks for each question.** **[16]**

1) Write two difference between order of reaction and molecularity.

2) Explain Mond process for refining Nickel with chemical equation.

3) Draw structures of geometrical isomers of $[Fe(NH_3)_2(CN)_4]^-$.

OR

Write any four limitations of valence bond theory of complex compound.

4) Write two step equation for the following conversion.

- Benzene to diphenyl

5) Write the reaction of aniline and ethenamine with nitrous acid.

6) Write the reaction equation to show the presence of –CHO and $>C=O$ group in Glucose.

7) Explain method of preparation of Nylon 6,6 by chemical equation.

OR

Explain method of preparation of PHBV by chemical equation.

8) Explain structure of cationic detergents with example and write any one use of it.

SECTION - B

■ **Answer the following questions 9-14 in detail, three marks for each question.** [18]

9) How does doping increase the conductivity of semiconductors? Explain.

10) Derive the formula of first order reaction for -
   i) Rate constant K
   ii) Half life period $t_{½}$ (Graph is not required)

11) What are emulsion. Explain different types of emulsion with example.

12) Write the complete balanced equations of the following :
   i) $Cu + HNO_{3(conc.)} \rightarrow$
   ii) $C + H_2SO_{4(conc.)} \rightarrow$
   iii) $Cl_2 + NaOH_{(Hot\ and\ conc.)} \rightarrow$

OR

Give reason-
   i) BiH_3 is the strongest reducing agent almost all the hydrides of group 15 elements.
   ii) H_2O is a liquid and H_2S is a gas.
   iii) Fluorine exhibits only-1 oxidation state whereas other halogens exhibit +1, +3, +5 and +7 oxidation states also.

13) Describe the preparation of potassium dichromate from iron chromite ore with equation.

14) Write the equation of the reaction of hydrogen iodide with :
   i) 1-Propoxypropane
   ii) methoxybenzene
   iii) benzyl ethyl ether

OR

Write the reactions of Williamson synthesis of 2-ethoxy-3-methyl pentane starting from ethanol and 3 methyl pentan-2-ol.

SECTION - C

■ **Answer the following Q.No. 15-18 essay type questions in detail. 4 marks for each question.** [16]

15) Two elements A and B form compounds having formula AB_2 and AB_4. When dissolved in 20g of benzene (C_6H_6), 1g of AB_2 lowers the freezing point by 2.3K whereas 1g of AB_4 lowers it by 1.3K. The molar depression constant for benzene is 5.1 K kg.mol^{-1}. Calculate atomic masses of A and B.

16) Resistance of conductivity cell filled with 0.1 mol L^{-1} KCl solution is 100Ω. If the resistance of the same cell when filled with 0.03 mol L^{-1} KCl solution is 520Ω, calculate the conductivity and molar conductivity of 0.03 mol L^{-1} KCl solution. The conductivity of 0.1 mol L^{-1} KCl solution is 1.29 S/m.

OR

Three electrolytic cells A, B, C containing solution $NiSO_4$, $AgNO_3$ and $CuSO_4$, respectively are connected in series. A steady current of 1.5 amperes was passed through them until 1.45 g of silver deposited at the cathode of cell B. How long did the current flow? What mass of copper and Nickel were deposited? Atomic mass of Ag = 108u, Ni = 58.7u, Cu = 63.5u

17) i) Explain that complex $[Ti(H_2O)_6]^{3+}$ is voilet in colour, on the basis of crystal field theory.

ii) Discuss the nature of bonding in metal carbonyls.

18) i) Explain Tollen's test for identification of aldehyde with chemical equation.

ii) Write only equation of propanone of the following reactions.

a) Wolff-kishner reduction

b) Aldol condensation