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

Sl.No. 1300099

052 (E)

(MARCH, 2023)
SCIENCE STREAM
(CLASS - XII)

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.
13

(Part - A)

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

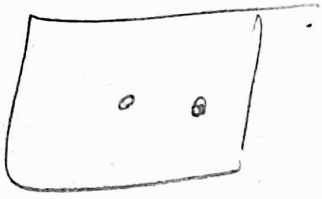
Instructions :

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 substance is used as collector in froth floatation process?

(A) phenol
(B) aniline
(C) fatty acid
(D) cresol

Rough Work



Rough Work

2) For which concentrated ore calcination process is not useful?

(A) PbS

(B) $Fe_2O_3 \cdot x\,H_2O$

(C) $ZnCO_3$

(D) $CaCO_3 \cdot Mg\,CO_3$

3) German silver is a mixture of which metals?

(A) Zn, Ni

(B) Fe, Cu, Sn

(C) Ag, Cu, Ni

(D) Cu, Zn, Ni

4) How many lone pair of electron is present on Xe in XeO_3?

(A) 0

(B) 2

(C) 1

(D) 3

5) Which order for thermal stability of the following compounds is correct?

(A) $H_2Te > H_2Se > H_2O > H_2S$

(B) $H_2O > H_2S > H_2Se > H_2Te$

(C) $H_2S > H_2Se > H_2Te > H_2O$

(D) $H_2Te > H_2Se > H_2S > H_2O$

Rough Work

6) Which gas is used in Holme's signal?

(A) SO_2 (B) NO_2

(C) H_2S (D) PH_3

7) $C + H_2SO_4$ (Conc.) $\longrightarrow X + Y + H_2O$ Identify X and Y.

(A) $X = CO_2, Y = SO_2$

(B) $X = CO_2, Y = H_2S$

(C) $X = CO, Y = SO_3$

(D) $X = CO, Y = H_2S$

8) The shape of manganate ion is _____.

(A) square pyramidal

(B) tetrahedral

(C) pyramidal

(D) square planar

9) Which compound has magnetic moment equal to 4.90 BM?

(A) $Cr_2(SO_4)_3$

(B) $NiSO_4$

(C) $FeSO_4$

(D) $MnSO_4$

Rough Work

10) Which oxidation state is common for lanthanoid elements?

(A) +5

(B) +3

(C) +4

(D) +2

11) Number of possible isomers for $[Cr(H_2O)_2(C_2O_4)_2]^-$ are _____.

(A) 6

(B) 4

(C) 2

(D) 3

12) Which is correct formula of Wilkinson catalyst?

(A) $[(Me_3As)_3RhCl]$

(B) $[(Me_3P)_3RhCl]$

(C) $[(Ph_3P)_3RhCl]$

(D) $[(Ph_3As)_3RhCl]$

13) How many monochloro structural isomers expected to be formed on free radical monochlorination of iso-pentane?

Rough Work

(A) 5

(B) 4

(C) 2

(D) 3

14) $R' - X \xrightarrow{Na/ether}$ 2, 3 - dimethylbutane. Identify R'

(A) $(CH_3)_2 CH -$

(B) $(C_2H_5)_2 CH -$

(C) $(CH_3CH_2)_3 C -$

(D) $(CH_3)_3 C -$

15) Which compound has highest reactivity towards SN^2 reaction?

(A) 1-Bromo-3-methylbutane

(B) 1-Bromo-2-methylbutane

(C) 1-Bromobutane

(D) 1-Bromo-2,2-dimethylpropane

Rough Work

16) By which reaction Freon 12 is prepared from CCl_4?

(A) Finkelstein reaction

(B) Fitting reaction

(C) Wurtz reaction

(D) Swarts reaction

17) Which compound will give yellow precipitate on reaction with sodium hypoiodite?

(A) sec-Butyl alcohol

(B) tert-Butyl alcohol

(C) isobutyl alcohol

(D) n-Butyl alcohol

18) Salicylaldehyde on heating with zinc dust give _____ organic product.

(A) Benzene

(B) Benzaldehyde

(C) Benzoic acid

(D) Benzyl alcohol

Rough Work

19) Which compound has highest value of pKa?

(A) m-nitrophenol

(B) phenol

(C) p-cresol

(D) o-nitrophenol

20) Which reagent is useful in the conversion of ethanenitrile to ethanal?

(A) $LiAlH_4$

(B) PCC

(C) Anhydrous CrO_3

(D) DIBAL-H

21) How many π -electrons are present in phthalimide?

(A) 10

(B) 12

(C) 6

(D) 5

Rough Work

22) Which salt is insoluble in water?

(A) $C_6H_5N_2^+HSO_4^-$

(B) $C_6H_5N_2^+BF_4^-$

(C) $C_6H_5N_2^+Br^-$

(D) $C_6H_5N_2^+Cl^-$

23) Which compound will not give ethanamine on reduction?

(A) Nitroethane

(B) Ethanamide

(C) Ethanoyl chloride

(D) Ethanenitrile

24) Which gas is evolved during the reaction of methyl amine with HNO_2?

(A) NO_2

(B) NH_3

(C) H_2

(D) N_2

25) Which reagent is used to distinguish aniline and benzylamine?

Rough Work

(A) Br_2/H_2O

(B) $C_6H_5SO_2Cl$

(C) $CHCl_3+KOH$

(D) CH_3COCl/pyridine

26) Thyroxine produced in the thyroid gland is an iodinated derivative of _____ amino acid.

(A) histidine

(B) cysteine

(C) tyrosine

(D) glutamine

27) Which one acts as non reducing sugar?

(A) maltose

(B) lactose

(C) glucose

(D) sucrose

Rough Work

28) Which polysaccharide is highly branched?

(A) amylopectin

(B) glycogen

(C) amylose

(D) cellulose

29) Which vitamin must be supplied regularly in diet?

(A) Vitamin C

(B) Vitamin K

(C) Vitamin D

(D) Vitamin E

30) _____ is polyester type biodegradable polymer.

(A) Glyptal

(B) PHBV

(C) Nylon-2-nylon-6

(D) Dacrone

Rough Work

31) Which polymer can not be obtained from diene monomer?

(A) Buna-S

(B) Neoprene

(C) Buna-N

(D) Novolac

32) Polymer used in making unbreakable laminated sheets has _____ repeating structural unit.

(A) $\{OCH_2 - CH_2 - CONH - CH_2\}$

(B) $\{NH - CONH - (CH_2)_3 - NH\}$

(C) $\{NH - CH_2 - CONH - CH_2 - CO\}$

(D) $\{NH - CO - NH - CH_2\}$

33) Which drug act as antihistamine?

(A) brompheniramine

(B) veronal

(C) paracetamol

(D) phenelzine

34) Sodium metal crystallises in bcc structure. How many unit cell are present in 9.2 g crystal of sodium metal? [Atomic Mass : Na = 23 $gmol^{-1}$]

(A) 3.2×10^{24}

(B) 1.20×10^{23}

(C) 2.4×10^{23}

(D) 6.022×10^{24}

35) In Al_2O_3 crystal oxides ions are arranged in ccp structure. How much part of octahedral void is occupied by Al^{3+} ions?

(A) $1/4$

(B) $1/3$

(C) $1/2$

(D) $2/3$

36) Which oxide behave like metallic or insulator depending on temperature?

(A) MgO

(B) CrO_2

(C) TiO_3

(D) SiO_2

37) For unit cell of $BaSO_4$ crystal which option for axial angles is correct?

(A) $\alpha = \beta = \gamma \neq 90°$

(B) $\alpha = \beta = 90°, \gamma = 120°$

(C) $\alpha = \gamma = 90°, \beta \neq 90°$

(D) $\alpha = \beta = \gamma = 90°$

38) Elevation in boiling point of the aqueous solution of 0.01 M $BaCl_2$ compare to 0.01M urea is _____.

(A) approximately half

(B) equal

(C) approximately three times

(D) approximately twice

Rough Work

39) If the solubility product of CuS is 9×10^{-16}, then what will be maximum molarity of CuS in aqueous solution?

(A) 2×10^{-10} M

(B) 5×10^{-7} M

(C) 3×10^{-8} M

(D) 6×10^{-12} M

40) Which mixture shows negative deviation from Raoult's law?

(A) ethanol and acetone

(B) carbon disulphide and acetone

(C) hexane and heptane

(D) phenol and aniline

41) Which species is obtained at anode on electrolysis of aqueous solution containing higher concentration of H_2SO_4?

(A) $S_2O_3^{2-}$

(B) SO_3^{2-}

(C) $S_2O_8^{2-}$

(D) SO_2

42) Which substance is used as cathode in mercury cell?

(A) $ZnO + NaOH$

(B) $ZnO + Pt$

(C) $HgO + KOH$

(D) $HgO + C$

Rough Work

43) If $E^{\circ}Fe^{3+}/Fe = xV$, $E^{\circ}Fe^{2+}/Fe = yV$ then what will be the value of $E^{\circ}Fe^{3+}/Fe^{2+}$?

(A) $3x - 2y$ (B) $3x + 2y$

(C) $2x + y$ (D) $x - y$

44) In which of the following condition reduction potential of hydrogen half cell will be negative?

(A) $PH_2 = 1$ atm and $[H^+] = 2M$

(B) $PH_2 = 2$ atm and $[H^+] = 1M$

(C) $PH_2 = 1$atm and $[H^+] = 1M$

(D) $PH_2 = 2$ atm and $[H^+] = 2M$

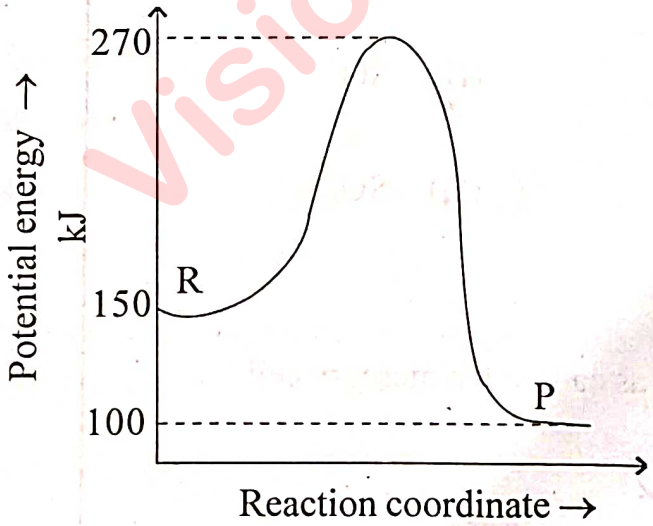
45) What will be the unit of rate constant for following reaction?

$$C_2H_{4(g)} + H_{2(g)} \longrightarrow C_2H_{6(g)}$$

(A) $mol^{-2}\,L^2\,S^{-1}$ (B) S^{-1}

(C) $mol^{-1}\,L\,S^{-1}$ (D) $mol\,L^{-1}\,S^{-1}$

46) For R → P reaction, following graph is given.



What will be enthalpy change for the given reaction?

(A) 170 kJ (B) 50 kJ

(C) –50 kJ (D) 120 kJ

Rough Work

47) Time taken to complete zero order reaction is _____.

(A) $\frac{k}{[R]_0}$

(B) $\frac{2k}{[R]_0}$

(C) $\frac{[R]_0}{2k}$

(D) $\frac{[R]_0}{k}$

48) Which pair of emulsions can be diluted by water?

(A) milk and vanishing cream

(B) milk and cream

(C) cream and vanishing cream

(D) butter and cream

49) At equilibrium state in process of adsorption _____.

(A) $\Delta H < T\Delta S$

(B) $\Delta H > T\Delta S$

(C) $\Delta H > 0$

(D) $\Delta H = T\Delta S$

50) _____ is the example of colloid in which dispersed phase is liquid and dispersion medium is gas.

(A) froth

(B) fog

(C) smoke

(D) cell fluids

052 (E)

(MARCH, 2023)
SCIENCE STREAM
(CLASS - XII)

(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 to 8 in brief. 2 Marks for each question. [16]

1) How catalyst increases the rate of reaction? Explain it by graph.

2) Explain the method for refining impure Copper.

OR

How is leaching carried out in case of low grade Copper Ores?

3) Explain the nature of bonding in metal carbonyls.

4) Write down chemical equations to prepare following substances from 1-Chloropropane.

   i) Propene.

   ii) Propan-1-*ol*.

5) Write down chemical equations to prepare orange and yellow dye from diazonium salt.

14) Explain dehydration reaction of alcohol to form alkene.

OR

Explain different Friedel-Crafts reactions of anisole.

SECTION - C

■ **Answer the following Q.No. 15 to 18 in detail. 4 Marks for each question.** [16]

15) Vapour pressure of Chloroform ($CHCl_3$) and dichloromethane (CH_2Cl_2) at 298 K are 200 mm Hg and 415mm Hg respectively.

i) Calculate the vapour pressure of the solution prepared by mixing 50 g of $CHCl_3$ and 30 g of CH_2Cl_2 at 298 K.

ii) Calculate mole fractions of each component in vapour phase.

[Atomic mass : H = 1, C = 12, Cl = 35.5]

OR

Calculate the depression in the freezing point of water when 10 g of $CH_3CH_2CHClCOOH$ is added to 250 g of water.

$Ka = 1.4 \times 10^{-3}$, $K_f = 1.86$ K kg mol^{-1}

[Atomic mass : H = 1, C = 12, O = 16, Cl = 35.5]

16) $\mathring{\Lambda}_m$ for NaCl, HCl and NaAc are 126.4, 425.9 and 91.0 Scm^2mol^{-1} respectively. Conductivity of 0.00241 M acetic acid is 7.896×10^{-5} S cm^{-1}. Calculate molar conductivity and dissociation constant of acetic acid.

17) $[Mn(H_2O)_6]^{2+}$ contains five unpaired electrons, while $[Mn(CN)_6]^{4-}$ contains only one unpaired electron. Explain using crystal field theory.

18) An organic compound with the molecular formula $C_9H_{10}O$ forms 2,4-DNP derivative, reduces Tollens' reagent and undergoes Cannizzaro reaction. On vigorous oxidation it gives 1,2-benzenedicarboxylic acid. Identify the compound and write down it's above chemical reactions.

6) Write down structural difference between DNA and RNA. [Any two points]

OR

What is the effect of denaturation on the structure of proteins?

7) Due to which reasons vulcanisation of natural rubber is necessary?

8) Why do soaps not work in hard water?

SECTION - B

■ **Answer the following Q.No. 9 to 14 in detail. 3 Marks for each question.** [18]

9) Write down distinction between crystalline and amorphous solids on the basis of the following properties.

i) Melting point,

ii) Cleavage property and

iii) Order in arrangement of constituent particles.

10) The following data were obtained during the first order thermal decomposition of $N_2O_{5(g)}$ at constant volume : $2N_2O_{5(g)} \rightarrow 2N_2O_{4(g)} + O_{2(g)}$

S.No.	Time (s)	Total Pressure (atm)
1	0	0.5
2	100	0.512

Calculate the rate constant.

11) Explain shape selective catalysis by zeolite.

12) What is aqua regia? Write down balanced chemical equations of it's reaction with Au and Pt.

OR

For identification of which ion brown ring test is carried out? Write down chemical equations involved in this test.

13) Give reason :

i) Transition elements exhibit higher enthalpies of atomisation.

ii) In aqueous solution, Cr^{2+} is stronger reducing agent than Fe^{2+}.

iii) The second ionisation enthalpy of Cu is higher than Zn.