

Gujarat Board

QUESTION PAPER

Gujarat Secondary and Higher Secondary Education Board Previous Year Question Papers

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

Sl.No.

052 (E)

(JUNE, 2024)
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.**
8) **Signs used in question Paper have usual meaning.**

1) Which compound gives fast reaction with Lucas's reagent?

Rough Work

(A) $CH_3CH_2CH(CH_3)OH$

(B) $(CH_3)_2CHOH$

(C) $(CH_3)_3COH$

(D) $CH_3CH_2CH_2OH$

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Rough Wo

2) Reduction of which compound gives optically active alcohol?

(A) Methyl butanoate

(B) Butenone

(C) Butanoic acid

(D) Butanal

3) Which of the following reactions is not electrophillic substitution reaction?

(A) phenol $\xrightarrow{NaOH/CHCl_3}$

(B) phenol $\xrightarrow{dil\ HNO_3}$

(C) phenol $\xrightarrow{H_2CrO_4}$

(D) phenol $\xrightarrow{Br_2/CS_2}$

4) Assertion : Boiling point of p-nitro phenol is higher than that of o-nitro phenol

Reason : p-Nitro phenol has intramolecular hydrogen bond whereas o-nitro phenol has intermolecular hydrogen bond.

(A) Both assertion and reason are wrong

(B) Assertion is wrong but reason is correct

(C) Assertion is correct but reason is wrong

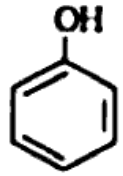
(D) Both assertion and reason are correct

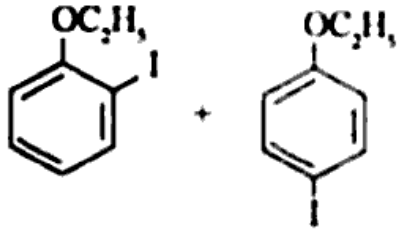
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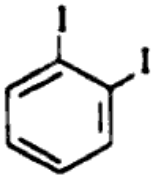
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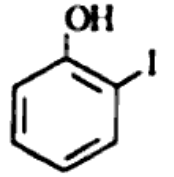
5) $C_6H_5OC_2H_5 + HI \rightarrow X + Y$, Here X and Y are _____.

Rough Work

(A)  $+ C_2H_5I$

(B) 

(C)  $+ C_2H_5OH$

(D)  $+ C_2H_5I$

6) Product of which reaction is not benzaldehyde?

(A) $C_6H_6 \xrightarrow[\text{anhy. } AlCl_3]{CO + HCl}$

(B) $C_6H_5CH_3 \xrightarrow[CS_2]{CrO_2Cl_2}$

(C) $C_6H_5CH_3 \xrightarrow{KMnO_4 + KOH}$

(D) $C_6H_5COCl \xrightarrow[Pd-BaSO_4]{H_2}$

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7) 2-methyl but-2-ene $\xrightarrow[(ii)\ Zn/H_2O]{(i)\ O_3}$ products here products are _____.

(A) $CH_3CH_2COCH_3 + HCHO$

(B) $CH_3CHO + CH_3CH_2CHO$

(C) $CH_3COCH_3 + CH_3CH_2CHO$

(D) $CH_3COCH_3 + CH_3CHO$

8) Which compound can reduced Fehling reagent?

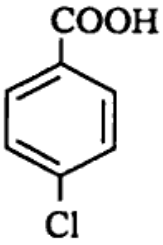
(A) Acetophenone

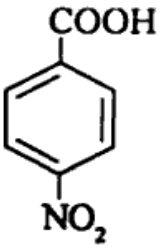
(B) Acetaldehyde

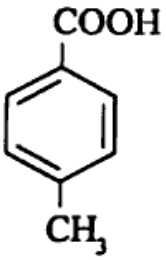
(C) Acetone

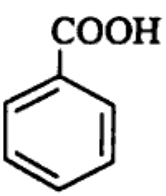
(D) Benzaldehyde

9) _____ compound has highest pKa.

(A) 

(B) 

(C) 

(D) 

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10) Which of the following compound is used as Food Preservative?

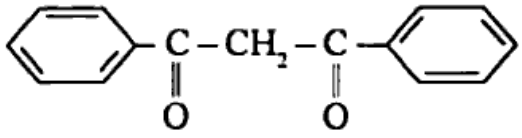
(A) Acetone

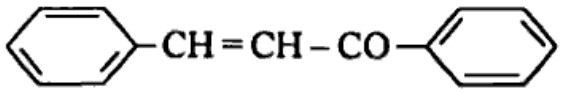
(B) Benzaldehyde

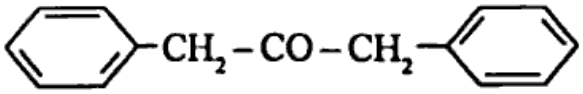
(C) Sodium phenoxide

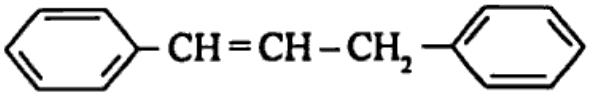
(D) Sodium benzoate

11) $C_6H_5\ CHO + C_6H_5\ COCH_3 \xrightarrow[293\ K]{OH^-}$ product of reaction is _____.

(A) 

(B) 

(C) 

(D) 

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12) $RCONH_2 + Br_2 + NaOH \xrightarrow{\Delta}$, This reaction is known as _____ name.

(A) Hoffmann

(B) Sandmayer

(C) Gatterman

(D) Gabriel

13) Among the given which compound has highest boiling point?

(A) $CH_3CH_2CH_2NH_2$

(B) $CH_3CH_2CH_2NHCH_3$

(C) $CH_3CH_2NHCH_2CH_3$

(D) $CH_3CH_2CH_2CH_2NH_2$

14) Which reagent is used to distinguish ethyl amine and Aniline?

(A) CH_3I

(B) Br_2/H_2O

(C) $C_6H_5SOCl_2$

(D) $KOH + CHCl_3$

15) $C_6H_5N_2^+Cl^- + CH_3CH_2OH \longrightarrow$, which is oxidised product of the reaction?

(A) CH_3COOH

(B) C_6H_5OH

(C) CH_3CHO

(D) C_6H_6

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Rough Wo

16) Acid anhydride on reaction with primary amines give _____.

(A) Imine

(B) Imide

(C) Secondary amine

(D) Amide

17) X + Hinsberg's reagent → product here X is _____.
(Soluble in alkali)

(A) $(CH_3)_2 N CH_2 CH_3$

(B) $CH_3 CH_2 NH CH_3$

(C) $CH_3 CH_2 CH_2 NH_2$

(D) $CH_3 CH_2 NH CH_2 CH_3$

18) Which is bicyclic base?

(A) U

(B) C

(C) T

(D) G

19) _____ is responsible for development of secondary male characteristic like deep voice and facial hair.

(A) Estratriol

(B) Progesterone

(C) Estradiol

(D) Testosterone

20) Which carbohydrate is present in liver?

(A) Glycogen

(B) Amylose

(C) Amylopectin

(D) Cellulose

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21) Match the vitamin given in Column I with the their chemical name given in Column II.

Column - I		Column - II	
(i)	Vitamin B_6	(P)	Ascorbic acid
(ii)	Vitamin B_1	(Q)	Riboflavin
(iii)	Vitamin B_2	(R)	Thiamine
(iv)	Vitamin C	(S)	Pyridoxine

(A) (i) → S, (ii) → Q, (iii) → R, (iv) → P

(B) (i) → Q, (ii) → R, (iii) → S, (iv) → P

(C) (i) → S, (ii) → R, (iii) → Q, (iv) → P

(D) (i) → R, (ii) → Q, (iii) → S, (iv) → P

22) A solution is obtained by mixing 400 g of 25% solution and 600 g of 40% solution by mass. What is the mass percentage of resulting solution?

(A) 25

(B) 50

(C) 34

(D) 35

23) The partial pressure of ethane over a solution containing 7.14×10^{-3} g of ethane is 1 bar. If the solution contains 5×10^{-2} g of ethane, then what shall be the partial pressure of the gas? (At equal temperature)

(A) 13 bar

(B) 3 bar

(C) 7 bar

(D) 4 bar

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Rough W

24) Under identical condition, which aqueous solutions has equal freezing point?

(Molecular mass of urea = 60 u and glucose = 180 u)

(A) 10 g urea in 100 g H_2O and 5 g glucose in 100 g H_2O

(B) 6 g urea in 100 g H_2O and 18 g glucose in 100 g H_2O

(C) 5 g urea in 100 g H_2O and 10 g glucose in 100 g H_2O

(D) 10 g urea in 100 g H_2O and 10 g glucose in 100 g H_2O

25) Which of following mixture is an ideal solution?

(A) Acetone + chloroform

(B) Acetone + Ethanol

(C) n - hexane + n - heptane

(D) Phenol + Aniline

26) In which solution, solubility of solute decrease with increase of temperature?

(A) Ethanol dissolved in water

(B) Glucose dissolved in water

(C) Na - Hg amalgam

(D) Chlorine dissolved in water

27) Among the given solutions which one has hightest boiling point under similar condition?

(A) 1 m $FeCl_3$

(B) 1 m NaCl

(C) 1 m $BaCl_2$

(D) 1 m Urea

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Rough

28) Which metal can not be produced H_2 gas by reaction with HCl solution?

$E^{\circ}_{Fe^{2+}/Fe} = -0.44V \quad E^{\circ}_{Cu/Cu^{2+}} = -0.34V$

$E^{\circ}_{Ni^{2+}/Ni} = -0.25V \quad E^{\circ}_{Zn^{2+}/Zn} = -0.76V$

(A) Zn

(B) Ni

(C) Cu

(D) Fe

29) Standard electrode potential for Daniell cell is 1.1 V. What will be the standard Gibbs energy for the reaction

$Zn_{(s)} + Cu^{2+}_{(aq)} \rightarrow Zn^{2+}_{(aq)} + Cu_{(s)}$ (F = 96487 C mol^{-1})

(A) + 318.40 KJ

(B) + 212.27 KJ

(C) – 318.40 KJ

(D) – 212.27 KJ

30) What will be the pH of solution which is in contact with hydrogen electrode having oxidation potential 0.177 V?

(A) 3

(B) 5

(C) 10

(D) 2

31) Which is act as Reducing agent when Dry cell is working?

(A) Graphite

(B) MnO_2

(C) NH_4Cl

(D) Zn

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32) The electronic conductance does not depends on _____.

(A) concentration of the electrolyte

(B) the number of valance electrons per atom

(C) temperature

(D) the nature and structure of the metal

Rough

33) How much electricity in terms of faraday is required to produced 2.7 g of Al from molten Al_2O_3?

(Atomic mass of Al = 27 u)

(A) 0.6

(B) 0.1

(C) 0.2

(D) 0.3

34) Which ions has highest magnetic moment (only spin)?

(A) Fe^{3+}

(B) Cr^{3+}

(C) Co^{3+}

(D) Ti^{3+}

35) Which is use as catalyst in Wacker process?

(A) AgCl

(B) $PtCl_4$

(C) $FeCl_3$

(D) $PdCl_2$

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36) Bronze is mixture of _____ metals.

(A) Cu + Ag

(B) Cu + Sn

(C) Cu + Ni

(D) Cu + Zn

37) Green coloured compound possess _____ ion.

(A) MnO_4^{2-}

(B) $Cr_2O_7^{2-}$

(C) MnO_4^-

(D) CrO_4^{2-}

38) How many total number of ions are obtained by ionisation of Iron (III) hexacyanido ferrate (II), complex?

(A) 5

(B) 4

(C) 3

(D) 7

39) Indicate the complex entity which shows optical isomerism.

(A) Trans - $[PtCl_2(en)_2]^{2+}$

(B) $[Co(NH_3)_4 Cl_2]^+$

(C) Cis - $[CrCl_2(OX)_2]^{3-}$

(D) $[Co(NH_3)_3 (NO_3)_3]$

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Rough Work

40) Chlorophyll is a coordination compound of _____.

(A) Nickel

(B) Cobalt

(C) Iron

(D) Magnesium

41) Which one is correct for high spin complex?

(A) $\Delta_o \geq P$

(B) $\Delta_o < P$

(C) $\Delta_o = P$

(D) $\Delta_o > P$

42) _____ compound is diamagnetic and tetrahydral.

(A) $K_2[NiF_4]$

(B) $K_2[Ni(CN)_4]$

(C) $K_4[Ni(CN)_4]$

(D) $K_2[NiCl_4]$

43) For a certain reaction $K = 2.37 \times 10^2 L^2 mol^{-2} S^{-1}$. What will be order of reaction?

(A) 3

(B) 0

(C) 2

(D) 1

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Rough W

44) A reaction A + B → C is second order in A and zeroth order in B. How is the rate affected when the concentration of A is doubled and B is halfed?

(A) ½ times

(B) 2 times

(C) 8 times

(D) 4 times

45) In the presence of a catalyst, the heat evolved or absorbed during the reaction _____.

(A) may increase or decrease

(B) decreases

(C) remains unchanged

(D) increases

46) For a first order reaction half life period is 5 min. What time it will take to 99.9% completion of reaction?

(A) 40 min

(B) 25 min

(C) 20 min

(D) 50 min

47) What is the value of slope of plot $\ln K \rightarrow \frac{1}{T}$ for reaction having $E_a = 33.256$ J?

(A) −1.74

(B) −4

(C) 1.74

(D) 4

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48) _____ is not Allylic halide.

(A) 2 - bromo cyclohexene

(B) 3 - chloro prop - 1 - ene

(C) 3 - chloro cyclohexene

(D) 1 - chloro but - 2 - ene

49) Which compound has highest reactivity towards S_N1 reaction?

(A) $C_6H_5CH_2Br$

(B) $C_6H_5CH(CH_3)Br$

(C) $C_6H_5CH(C_6H_5)Br$

(D) $C_6H_5C(CH_3)(C_6H_5)Br$

50) When _____ compound comes in direct contact with the eyes can burn the cornea.

(A) CH_3Cl

(B) CCl_4

(C) CH_2Cl_2

(D) $CHCl_3$

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052 (E)

(JUNE, 2024)
SCIENCE STREAM
(CLASS - XII)

(Part - B)

Time : 2 Hours] ***[Maximum Marks : 5***

Instructions :

1) **Write in a clear legible handwriting.**
2) **There are three sections in Part - B of the question paper and total 1 to 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 any 8 questions from given question number 1 to 12. (Each of 2 marks)** **[16]**

1) The conductivity of 0.001 M CH_3COOH is 4.9×10^{-5} S cm^{-1}, calculate degree of dissociation of CH_3COOH if Λ_m° for CH_3COOH is 390.5 S cm^2 mol^{-1}.
2) Explain pseudo first order reaction.
3) Aqueous solution of $TiCl_3$ is coloured whereas aqueous solution of $TiCl_4$ is colourless, Give reason.
4) State the characteristics of Interstitial compounds.
5) Draw the geometrical isomers of $[Co(NH_3)_3(NO_2)_3]$.
6) Explain ambidentate ligand with example.
7) Give following conversion in two steps Benzyl chloride into Benzyl bromide.
8) State reaction equation ethyl chlorid with following compounds
   i) Aqueous KOH ii) Alcoholic KOH
9) Give reason : Ethanol has higher boiling point then that of methoxy methane.
10) Explain clemmensen reaction with one example.
11) Explain : sucrose is a non reducing sugar (figure not essential).
12) State the difference between globular and fibrous proteins.

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SECTION - B

Answer any 6 questions from given question number13 to 21. [18]
(Each of 3 marks)

13) Explain osmosis and osmetic pressure. Derive formula to find the molecular mass of solute on the basis of osmetic pressure of solution.

14) Calculate cell potential of following given cell at 298 K temperature.

$$Mg_{(s)} \mid Mg^{2+}_{(0.001M)} \parallel Cl^{-}_{(0.02M)} \mid Cl_{2(g,1bar)} \mid Pt_{(s)}$$

$$E^{0}_{Mg^{2+}/Mg} = -2.36V$$

$$E^{0}_{Cl_2/Cl^-} = 1.36V$$

15) Derive equation of rate constant and half life of reaction for the zeroth order reaction.

16) State the balance reaction equations of acidic permanganate ion with

i) Fe^{2+}

ii) $C_2O_4^{2-}$ and

iii) SO_3^{2-}

17) Although chlorine is an electron withdrawing group, yet it is ortho⁻, para⁻ directing in electrophilic aromatic substitution reaction, Explain.

18) State the reactions to prepare primary, secondary and tertairy alcohol from Grignard's reagent.

19) State the reaction equations to prepared benzoic acid from the following compounds

i) Ethyl benzene

ii) Benzoic anhydride

iii) Benzamide

20) Give following conversion in three steps :

Ethanoic acid into Methanol

21) Write only

i) Carbyl amine,

ii) Diazotisation and

iii) Acylation reactions of Aniline

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SECTION - C

Answer any 4 questions from given question number 22 to 27. (Each of 4 marks) **[16]**

22) Benzene and toluene from ideal solution over the entire range of composition. The vapour pressure of pure benzene and toluene at 300 K are 50.7 mm Hg and 32.1 mm Hg respectively. Calculate the mole fraction of benzene in vapour phase if 78 g of benzene is mixed with 138 g of toluene.
(Atomic mass C = 12 u, H = 1 u)

23) Explain chemistry of corrosion of iron and state the methods to prevent the corrosion.

24) The time required for 10% completion of a first order reaction at 298 K is equal to that required for its 25% completion at 308 K. Calculate value of emerge of activation for the reaction.

25) Explain on the basis of valance bond theory that $[Ni(CN)_4]^{2-}$ ion with square planar structure and the $[NiCl_4]^{2-}$ ion with tetrahydral geometry.

26) State Kolbe and Reimer - Tieman reactions of phenol.

27) An organic compound with the molecular formula C_8H_8O forms 2, 4 - DNP derivative, reduce Tollen's reagent and undergoes cannizzaro reaction. On vigorous oxidation it give 1, 4 - benzene di - carboxylic acid. Identify compound and write equation for the reactions involved.

▽▽▽▽

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