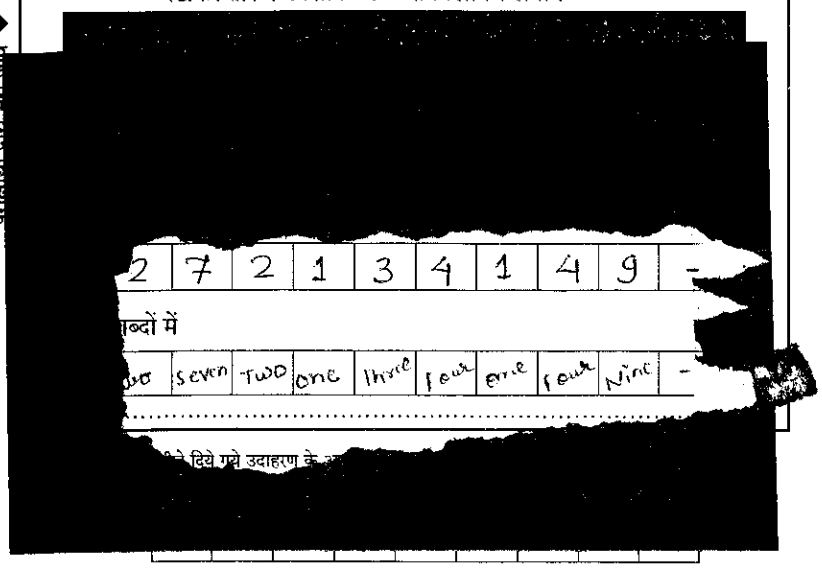
माध्यमिक शिक्षा मण्डल, मध्यप्रदेश, भोपाल 20[illegible]

24 पृष्ठीय

परीक्षार्थी द्वारा भरा जावे ↓

परीक्षा का विषय	विषय कोड	परीक्षा का माध्यम
Chemistry	2 2 0	ENGLISH

स्टीकर तीर के निशान ↓ से मिलाकर लगायें



परीक्षार्थी द्वारा भरा जावे →

क - पूरक उत्तर पुस्तिकाओं की संख्या अंकों में [X] शब्दों में [X]

ख - परीक्षार्थी का कक्ष क्रमांक [11]

ग - परीक्षा का दिनांक [23] [03] [2017]

परीक्षा का नाम एवं परीक्षा केन्द्र क्रमांक की मुद्रा

हायर सेकेण्डरी पर्री० परीक्षा केन्द्र क्रमांक-21202[illegible]

केन्द्राध्यक्ष/सहायक केन्द्राध्यक्ष एवं पर्यवेक्षक द्वारा भरा जावे →

पर्यवेक्षक का नाम एवं हस्ताक्षर	केन्द्राध्यक्ष/सहायक केन्द्राध्यक्ष के हस्ताक्षर
संदीप शर्मा Sandeep	

परीक्षक एवं उपमुख्य परीक्षक द्वारा भरा जावे ↓

प्रमाणित किया जाता है कि मूल्यांकन के समय पूरक उत्तर पुस्तिकाओं की संख्या उपरोक्तानुसार सही पाई होलो क्राफ्ट स्टीकर क्षतिग्रस्त नहीं पाया गया तथा अन्दर के पृष्ठों के अनुरूप मुख्य पृष्ठ पर अंकों की प्रविष्टी एवं अंकों का योग सही है।

निर्धारित मुद्रा : नाम, पदनाम, मोबाईल नम्बर, परीक्षक क्रमांक एवं पदांकित संस्था के नाम की मुद्रा लगाएं।

परीक्षक एवं उपमुख्य परीक्षक द्वारा भरा जावे →

उप मुख्य परीक्षक के हस्ताक्षर एवं निर्धारित मुद्रा	परीक्षक के हस्ताक्षर एवं निर्धारित मुद्रा
[illegible] उपाध्याय E/17/77349	R.NAMDEO 9770004

केवल परीक्षक द्वारा भरा जावे।

प्रश्न क्रमांक के सम्मुख प्राप्तां[illegible] ो प्रविष्ठी करें।

प्रश्न क्रमांक	पृष्ठ क्रमांक	क (अंक
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कुल प्राप्तांक शब्दों में | कुल प्राप्तांक अंकों में

A.BANOR 97[illegible]

② [ ] + [ ] = [ ]

योग पूर्व पृष्ठ | पृष्ठ 2 के अंक | कुल अंक

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Q. 1. — Q. 1

(a) (a) 8

(b) (d) cm^{-1}

(c) (a) Active mass

(d) (a) Exothermic

(e) (b) Chlorine

Q. 2 — Q. 2

(a) seven

(b) adsorbent

(c) $HgCl_2$

(d) Dimagnetic

(e) $(C_2H_5)_4Pb$

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Q.3

Q.3

(a) $2d \sin\theta = nd$

Here θ = angle of reflection

d = wavelength of X-rays

d = distance between successive planes

(b) peptide bond

(c) $C_6H_5N_2^+Cl^-$

(d) Oxidation state of iron is +3

(e) Xenon (Xe)

Q.4

Q.4

	A		B
(a)	Smell of mustard oil	-	Methyl isothiocyanate
(b)	Explosive	-	T.N.T
(c)	Hair fall	-	Biotin
(d)	Amorphous solid	-	Glass
(e)	Heteropolysaccharides	-	Glycogen

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Q.5

ns-5. **Peptization :-**

Peptization is the process of converting a freshly prepared precipitate into a colloidal solution by the addition of some specific compounds.

Ex :→ $AlCl_3 + 3H_2O \rightarrow \underset{(ppt)}{Al(OH)_3} + 3HCl$

$\underset{(ppt)}{Al(OH)_3} \xrightarrow{\text{peptization}} \underset{(\text{colloidal solution})}{Al(OH)_3}$

Question NO - 6

ns-6. Ionization energy of noble gases are highest because of the following reason -

They have stable electronic configuration i.e of 8 electrons in the outermost shell. Also they have smallest size in each period. As we more from left to right in a period, size

decreases, interionic attraction between electrons and nucleus increases. It becomes difficult to remove electrons. Hence they have highest ionization energy.

Question No - 7.

Ans → 7

IUPAC.

Iupac names

(i) $K_2[HgI_4]$:- Potassium tetraiodo mercurate (II)

(ii) $[Ag(NH_3)_2]Cl$:- ~~Diammine~~ Diammine Silver (I) Chloride

Question No - 8

Ans → 8

Carbohydrates

Carbohydrates are the ~~poh~~ polyhydroxy compounds of polyhydroxy aldehydes or polyhydroxy ketones which give polyhydroxy aldehyde or ketones on hydrolysis.

Carbohydrates are the source of energy.

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Types of carbohydrates :-

(i) Monosaccharides :- These carbohydrates are the basic carbohydrates which do not dissociate on hydrolysis.

Ex :- Glucose, etc

(ii) Oligosaccharides :- These carbohydrates give two to ten monosaccharides upon hydrolysis.

Ex :- Sucrose etc.

(iii) Polysaccharides :- These carbohydrates are made up of many monosaccharides and gave many monosaccharides upon hydrolysis.

Ex :- Starch, Cellulose, etc.

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Question No - 9

Ans-9

Positive deviation	Negative deviation
(i) Vapour pressure of each of the element of the solution is greater than the vapour pressure expected by Raoult's law.	(i) Vapour pressure of each of the element of the solution is less than the vapour pressure expected by Raoult's law.
(ii) A-B interaction is ~~greater~~ less than the A-A and B-B interaction. Therefore volume of the solution increases $\Delta V_{mix} = +ve$	(ii) A-B interaction is greater than A-A and B-B interaction. Therefore volume of solution decreases $\Delta V_{mix} = -ve$
(iii) Enthalpy change is positive. $\Delta H_{mix} = +ve$	(iii) Enthalpy change is negative $\Delta H_{mix} = -ve$
Conditions $P_A > P_A^\circ X_A$ $P_B > P_B^\circ X_B$ $\Delta V_{mix} = +ve$ $\Delta H_{mix} = +ve$	Conditions $P_A < P_A^\circ X_A$ $P_B < P_B^\circ X_B$ $\Delta V_{mix} = -ve$ $\Delta H_{mix} = -ve$

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Question No - 10

(i) Formality :- ~~The number of gram formula mass~~

The number of moles of solute having gram formata mass dissolved in solution of volume 1 litre is called formality. It is denoted by F.

$$\text{Formality} :- \frac{\text{Given mass of solute} \times 1000}{\text{Gram Formula mass} \times \text{Volume in(ml)}}$$

(ii) Parts per million :- Parts per million can be defined as the number of parts present ~~in~~ per million parts of the solution. It is denoted by ppm.

$$ppm = \frac{\text{Mass of solute}}{\text{Mass of solution}} \times 10^6$$

(iii) ~~Osp~~ Osmotic pressure :- The pressure which is applied on the solution side to prevent the entry of solvent into the solution through

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the semi permeable membrane is called osmotic pressure. It is denoted by π.

Question No - 11.

Ans → 11.

Inner Transition elements

f-block elements are called inner transition elements.
The elements in which the last electrons enters into the $(n-2)f$ orbitals or antipenultimate sub shell are called f-block elements or inner transition elements.

The general electronic configuration of these elements are is -
$$(n-2)f^{1\text{ to }14}\ (n-1)d^{0-2}\ (n)s^2$$

They include actinides and lanthanides. Last electrons enteras the inner orbitals i.e $(n-2)f$ orbitals. Therefore these elements are called inner transition elements.

Question No - 12

ns → 12

Lanthanides	Actinides
These elements come after the element lanthanum. Therefore these elements are called lanthanides.	These elements come after the element Actinium. Therefore these elements are called actinides.
They belong to 4-f series.	They belong to 5-f series
Their general electronic configuration is $4f^{1 \text{ to } 14}\ 5d^{0-2}\ 6s^2$	Their general electronic configuration is $5f^{1-14}\ 6d^{0-2}\ 7s^2$
All the elements are non-radioactive except one (promitium)	All the elements are radio active elements.

Question No - 13.

Half-life period

The total time taken for 50% completion of the reaction or time needed for the reactants to become half of the initial concentration is called half-life period of the reaction. It is denoted by $t_{1/2}$.

expression :-

Consider a first order reaction is -

$A \longrightarrow$ Products

Initially at $t=0$ a 0

at $t=t$, $a-x$ x

Rate of reaction $= \frac{dx}{dt} \propto (a-x)$

Rate $\frac{dx}{dt} = k(a-x)$

$\therefore \frac{dx}{a-x} = k\,dt$ - (i)

Integrating both sides

$$\int \frac{dx}{a-x} = \int k\,dt$$

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$-\log_e(a-x) = Kt + c$ — (ii)

When $t = 0$, $x = 0$

$\Rightarrow -\log_e(a-0) = 0 + C$

$C = -\log_e a$

Putting the value of c in eq-(ii)

$-\log_e(a-x) = kt - \log_e a$

$Kt = \log_e a - \log_e(a-x)$

$Kt = \log_e \frac{a}{a-x}$

$K = \frac{1}{t} \log_e \frac{a}{a-x}$

$K = \frac{2.303}{t} \log_{10} \frac{a}{a-x}$

When $t = t_{1/2}$, $x = a/2$

$t_{1/2} = \frac{2.303}{K} \log_{10} \frac{a}{a - a/2}$

$t_{1/2} = \frac{2.303}{K} \log_{10} \frac{2a}{a}$

$t_{1/2} = \frac{2.303}{K} \times (\log_{10} 2)$

$$t_{1/2} = \frac{2.303}{K} \times 0.3010$$

$$\boxed{t_{1/2} = \frac{0.693}{K}}$$

This is required half life period of a first order reaction.

Question No - 14.

Ans (14) Copper reacts with nitric acid in 4 different concentration and conditions -

(i) Copper reacts with dilute and cold nitric acid (HNO_3)

$$4Cu + 10HNO_3 \rightarrow 4Cu(NO_3)_2 + 5H_2O + N_2O$$

(dilute and cold)

(N_2O : Nitrous oxide)

(ii) Copper reacts with dilute and hot nitric acid.

$$3Cu + 8HNO_3 \rightarrow 3Cu(NO_3)_2 + 4H_2O + 2NO$$

(dilute and hot)

(NO : Nitric oxide)

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(iii) Copper reacts with concentrate and cold HNO_3.

$$Cu + 4HNO_3 \rightarrow Cu(NO_3)_2 + 2H_2O + 2NO_2$$

(Nitrogen dioxide)

(iv) Copper reacts with concentrate and hot HNO_3

$$5Cu + 12HNO_3 \rightarrow 5Cu(NO_3)_2 + 6H_2O + N_2$$

(Nitrogen)

Question No - 15.

Ans → 15. $C_2H_5Br + KOH \xrightarrow{-KBr} C_2H_5OH$

$\therefore A = C_2H_5OH$

$$C_2H_5OH + CaOCl_2 \xrightarrow[\substack{-CaCl_2 \\ -(HCOO)_2Ca \\ -H_2O}]{} CHCl_3$$

$B = CHCl_3$

$2CHCl_3 + Ag \xrightarrow[-6AgCl]{} CH \equiv CH$

$C = CH \equiv CH$

$CH \equiv CH \xrightarrow[Hg^{++}/H^+]{+H_2O} CH_3 - CHO$

$D = CH_3CHO$

A =	C_2H_5OH	Ethyl alcohol
B =	$CHCl_3$	Chloroform
C =	$CH \equiv CH$	Ethyne
D =	CH_3CHO	Ethanal

$CH \equiv CH$

$CH_3 - CHO$

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Question No - 16

(i) **Lucas reagent :**

Lucas reagent is a mixture of anhydrous $ZnCl_2$ and conc. HCl.

It is used to distinguish between primary, secondary and tertiary alcohol.

(a) If turbidity occurs within seconds then the alcohol is tertiary.

$$CH_3-\underset{CH_3}{\overset{CH_3}{\underset{|}{\overset{|}{C}}}}-OH + \underset{(conc)}{HCl} \xrightarrow[(anh)]{ZnCl_2} CH_3-\underset{CH_3}{\overset{CH_3}{\underset{|}{\overset{|}{C}}}}-Cl + H_2O$$

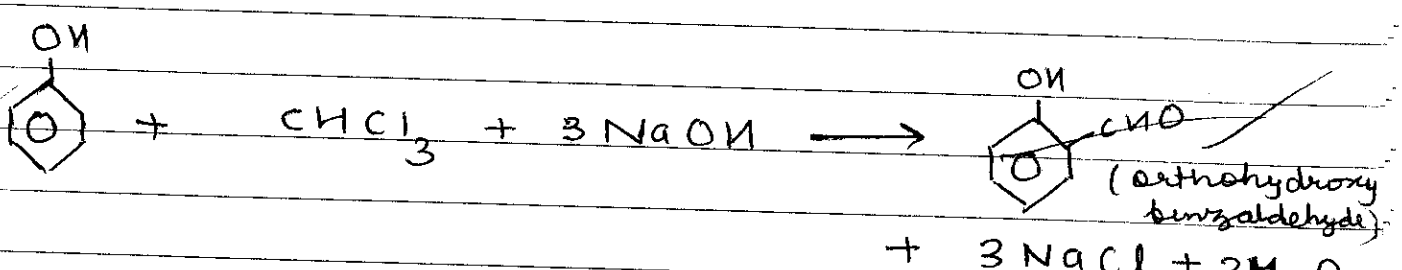
(b) If reaction occurs within minutes then the alcohol is secondary

$$CH_3-\underset{OH}{\underset{|}{CH}}-CH_3 + \underset{(conc)}{HCl} \xrightarrow[(anh)]{ZnCl_2} CH_3-\underset{Cl}{\underset{|}{CH}}-CH_3 + H_2O$$

(c) If the reaction does not occur when cold conditions are there. But if the mixture is heated then reaction occurs then the alcohol is primary.

$$CH_3-CH_2-OH + HCl \xrightarrow[\Delta]{ZnCl_2\ (anh.)} CH_3-CH_2-Cl + H_2O$$

(ii) Reimer Tiemann reaction :- When phenol reacts chloroform in the presence of alkali such as NaOH, then we get orthohydroxy benzaldehyde as the product and some amount of para hydroxy benzaldehyde is also formed.



This reaction is known as Reimer Tiemann reaction.

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Question No - 17.

Ans-17

(i) Perkin reaction :→ When benzaldehyde reacts with acetic anhydride in the presence of sodium ~~benzoate~~ acetate then we get cinnamic acid as the product and acetic acid.

$$C_6H_5CHO + (CH_3-CO)_2O \xrightarrow{CH_3COONa} C_6H_5-CH=CH-COOH + CH_3COOH$$

Here $C_6H_5-CH=CH-COOH$ = cinnamic acid
and CH_3COOH = acetic acid.

(ii) Urotropine :-

Urotroprine is formed when formaldehyde reacts with NH_3. We get hexamethylene ~~tra~~ tetra amine as the product which is called urotropine.

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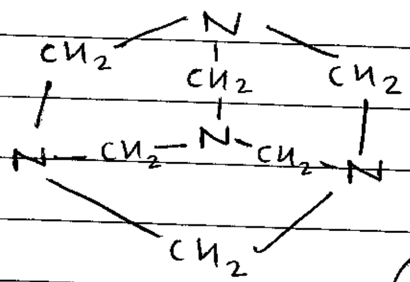
$6HCHO + 4NH_3 \longrightarrow (CH_2)_6N_4 + 6H_2O$

(Urotropine)

Structure



(Urotropine)

Urotropine is used in medicines for urinary infections.

Question No - 18.

Ans → 18 Kohlrausch law

Kohlrausch calculated the value of limiting molar conductivity of different electrolytes of same cation and same anion.

At infinite dilution, when all the molecules dissociated and the inter ionic attraction between them is negligible then each ion make a certain contribution to the conductivity

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of the electrolyte.

According to the Kohlrausch law, the molar conductivity of electrolyte at infinite dilution is the sum of ionic conductivities at cation and anion.

Mathematically,

$$\Lambda_m^\infty = x \lambda^+_{(cation)} + y \lambda^-_{anion}$$

where Λ_m^∞ = molar conductivity at infinite dilution

λ^+_{cation} = ionic conductivity of cation

λ^-_{anion} = ionic conductivity of anion.

Applications

(i) To find the molar conductivity of weak electrolyte.

Molar conductivity of weak electrolyte

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cannot be determined by simple methods to determine conductivity. But it can be easily calculated with the help of Kohlarausch law.

Ex :- To find the molar conductivity of acetic acid. (CH_3COOH)

We know that

$$\Lambda^\infty_{CH_3COOH} = \lambda_{CH_3COO^-} + \lambda_{H^+} \quad -(I)$$

Now

$$\Lambda^\infty_{CH_3COONa} = \lambda_{CH_3COO^-} + \lambda_{Na^+} \quad -(II)$$

$$\Lambda^\infty_{NaCl} = \lambda_{Na^+} + \lambda_{Cl^-} \quad -(III)$$

$$\Lambda^\circ_{HCl} = \lambda_{H^+} + \lambda_{Cl^-} \quad -(IV)$$

(II) + (IV) − (III)

$$= \lambda_{CH_3COO^-} + \lambda_{Na^+} + \lambda_{H^+} + \lambda_{Cl^-} - \lambda_{Na^+} - \lambda_{Cl^-}$$

$$= \lambda_{CH_3COO^-} + \lambda_{H^+}$$

$$= \Lambda^\infty_{CH_3COOH}$$

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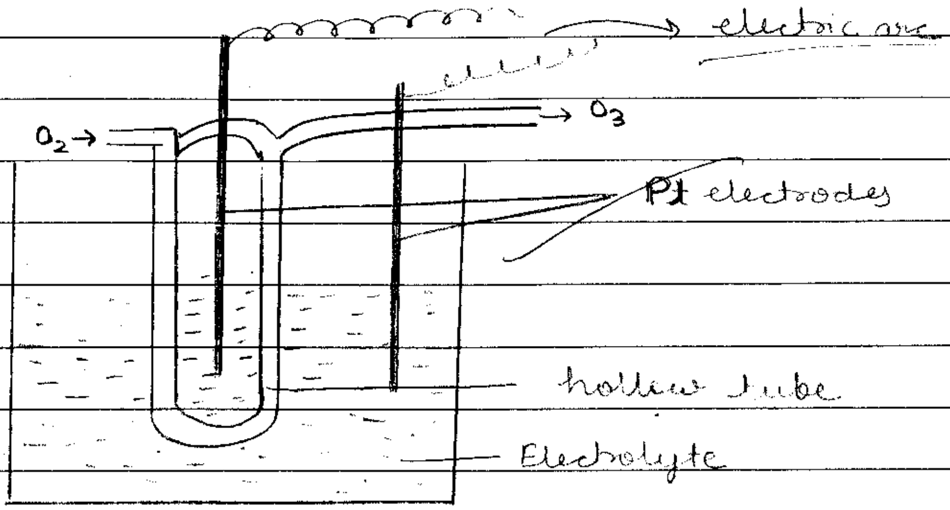
Question No - 19.

Brodie's Ozonizer :-

It is a device which convert the oxygen to ozone. It is the laboratory method to prepare ozone.

The principal equation is

$$3O_2 \xrightarrow[\text{arc}]{\text{Electric}} 2O_3$$



It consists of a hollow shaped ~~to~~ tube which consists of air. It is surrounded by an electrolyte (H_2SO_4) ~~fo~~ from both sides. One platinum rod is dipped inside and one is outside the tube.

Through this tube electric arcing is given. The oxygen due to the electric arc gets dissociate and then combine with another oxygen molecule to form ozone. Hence from the outer tube, ozonoid oxygen comes.

$$O_2 \rightarrow O + O$$

$$2 \times [O + O_2 \rightarrow O_3]$$

$$3O_2 \xrightarrow[\text{arc}]{\text{Electric}} 2O_3$$

Hence this is the ozonizer given by scientist Brodie to prepare ozone.

Question No - 20

Charak :- Charak was the son of a sage. He had spent his whole life in caring for the suffering of the other. He travelled from one village to other village to remove the suffering of the people. He was known to many peoples of the

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country. He was known as the father of ancient surgery. He was able to cure others by his own made medicines by the uses of many medicinal plants. He studied and preached in ancient vishwa-vidalayas of the country. He was able to cure many diseases and could perform many operations.

He has given his own principles in medical science known as Charak Samhita and could predict accurately about the genltic order.

(ii) Nalanda Vishwa Vidyalaya :-

One of the ancient vidyalaya of the India. It is situated near Bihar. It was famous all over the world. Students from many countries come here to learn various fields. This vidyalaya was famous for the teachings such as grammar, surgery, archery, etc. Many acharya used to teach there. Nagarjuna also belong to this vishwavidyalaya. It was known for a large library which was later burnt by a criminal. We can say it was the ancient best place for studying and teaching.

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