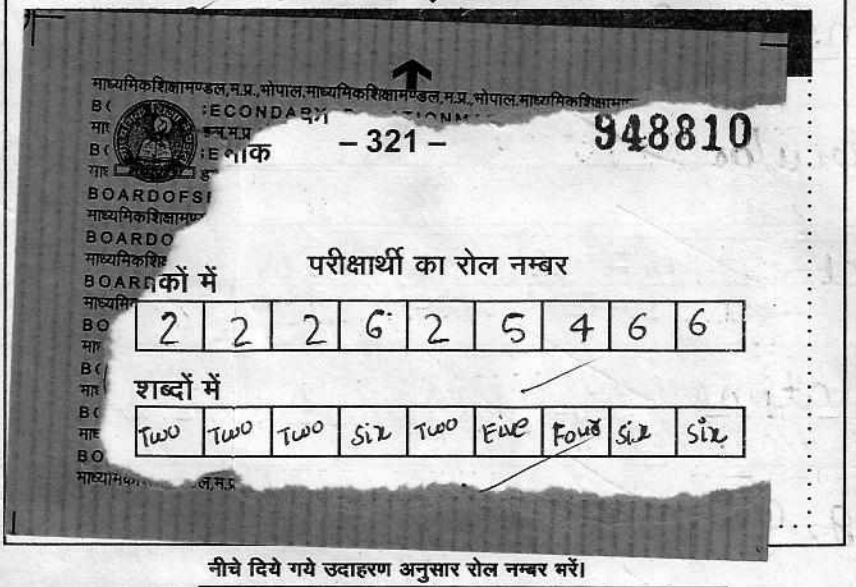
माध्यमिक शिक्षा मण्डल, मध्यप्रदेश, भोपाल

परीक्षार्थी द्वारा भरा जायें ↓

24 पृष्ठीय

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

स्टीकर तीर के निशान ↓ से मिलाकर लगायें



नीचे दिये गये उदाहरण अनुसार रोल नम्बर भरें।

उदाहरणार्थ	1	1	2	4	3	9	5	6	8
	एक	एक	दो	चार	तीन	नौ	पाँच	छः	आठ

क – पूरक उत्तर पुस्तिकाओं की संख्या अंको में 1 शब्दों में One

ख – परीक्षार्थी का कक्ष क्रमांक 12

ग – परीक्षा की दिनांक 28 | 02 | 2022

परीक्षा का नाम एवं परीक्षा केन्द्र क्रमांक की मुद्रा

हायर सेके... परीक्षा ... केन्द्र क्रमांक-261004

पर्यवेक्षक का नाम एवं हस्ताक्षर	केन्द्राध्यक्ष/सहायक केन्द्राध्यक्ष के हस्ताक्षर
Sanjeeta Jain	

परीक्षक एवं उपमुख्य परीक्षक द्वारा भरा जायें ↓

प्रमाणित किया जाता है कि मूल्यांकन के समय पूरक उत्तर पुस्तिकाओं की संख्या उपरोक्तनुसार सही पाई होलो क्राफ्ट स्टीकर क्षतिग्रस्त नहीं पाया गया अन्दर के पृष्ठों के अनुरुप मुख्य पृष्ठ पर अंकों की प्रविष्टी अंकों का योग सही है।
निर्धारित मुद्रा : नाम, पदनाम, मोबाईल नम्बर, परीक्षक क्रमांक एवं पदाकिंत संस्था के नाम की मुद्रा लगाएं।

उप मुख्य परीक्षक के हस्ताक्षर एवं निर्धारित मुद्रा	परीक्षक के हस्ताक्षर एवं निर्धारित मुद्रा
Rana Mahendra Singh Lecturer (8654) Govt. H.S.S. Modi	शा. मॉडल उ.मा.वि. आगर V.N.-12139

नोट :– ''हायर सेकेन्डरी परीक्षा में केवल वाणिज्य संकाय के विषयों तथा हाईस्कूल परीक्षा में प्रायोगिक विषय को छोड़कर शेष विषयों हेतु नियमित एवं स्वाध्यायी छात्रों के लिये प्रश्न पत्र 100 अंकों का होगा किन्तु नियमित छात्रों को 100 अंक के प्राप्तांक का 80% **अधिभार एवं** स्वाध्यायी छात्रों को 100 अंक के प्राप्तांक ही अंकसूची में प्रदर्शित किये जायेंगे।''

केवल परीक्षक द्वारा भरा जायें

प्रश्न क्रमांक के सम्मुख प्राप्ताकों की प्रविष्ठी करें

प्रश्न क्रमांक	पृष्ठ क्रमांक	प्राप्ताक (अंको में)
1		
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28		
कुल प्राप्तांक शब्दों में		कुल प्राप्तांक अंकों में
Seve...		

विशेष नोट :– सिलाई खुली हुई अथवा क्षतिग्रस्त उत्तर पुस्तिका को न तो पर्यवेक्षक वितरण करे और न ही छात्र उपयोग में ले। ऐसी उत्तर पुस्तिका में लिखें उत्तरों का मूल्यांकन नहीं किया जायेगा। परीक्षार्थी द्वारा भरा जायें → केन्द्राध्यक्ष/सहायक केन्द्राध्यक्ष एवं पर्यवेक्षक द्वारा भरा जायें → परीक्षक एवं उपमुख्य परीक्षक द्वारा भरा जायें →

मध्यप्रदेश

प्रश्न क्र.

M P B S E

Ans of Q. No. 1 (MCQs)

(i.) (b) Molecular

(ii.) (c) CsCl

(iii.) (b) Gelatine

(iv.) (a) Hg_2Cl_2

(v.) (c) OF_2

(vi.) (a) Polyamide

(vii.) (a) Seconal

Ans of Q. No. 2

Fill ups

(i.) Seven (7).

(ii.) directely propartional

(iii.) Peptization

(iv.) Formula of Fluorospar = 'CaF_2'

(v.) Chlorine (Cl)

कुल अंक

प्रश्न क्र.

(vii) Tetrafluoroethene
(viii) antiseptic

Ans of Q. No. 3

Matching

'A'	'B'
(i) Glass	(g) Amorphous solid
(ii) Slag	(e) $CaSiO_3$
(iii) Square planar	(a) XeF_4
(iv) Neutral ligand	(d) CO
(v) Spirit of wine	(b) C_2H_5OH
(vi) Primary amine	(c) RNH_2
(vii) Glucose	(b) $C_6H_{12}O_6$

प्रश्न क्र.

Ans of Q.No.4

One word:

(i.) Arrhenius equation is given as:

$$K = Ae^{-E_a/RT}$$

where:
K: Rate constant
A: Arrhenius factor
e: exponential factor
E_a: Activation energy
R: Universal Gas constant
T: Temperature

(ii) "Radon (Rn)" is used in the treatment of cancer.

(iii) The name of condensation reaction of benzaldehyde with KCN is "Benzoin condensation"

(iv) Due to the absence of active hydrogen in tertiary amine, they do not give acylation reaction.

प्रश्न क्र.

(v.) 'Keratin' is protein which is present in hair, wool and silk.

(vi.) Monomer of polyethene is 'ethene'.

(vii.) 'Aspirin' is an antipyretic medicine.

Ans of Q.No. 5 (OR)

Molarity

Molarity is defined as-

"The number of moles of the solute present in 1 Litre of the solution is called Molarity. It is represented by 'M'.

$$\text{Molarity} = \frac{\text{No. of moles of Solute}}{\text{Volume of solution in Litres}}$$

If 'w_B' is the mass of solute and 'M_B' is the molar mass of solute and 'V' is the volume of solution in Litres,

then.

$$\text{Molarity (M)} = \frac{w_B}{M_B} \times \frac{1}{V \text{(in Litres)}}$$

$$\text{Or } M = \frac{w_B}{M_B} \times \frac{1000}{V \text{(in mL)}}$$

S.I unit of Molarity is $mol\ L^{-1}$.

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Ans of Q.No.6 (OR)

- **Brownian movement**

- The zig-zag movement of colloidal particles in the colloidal solution is called "Brownian movement."

- It was first of all discovered by Scientist Brown.

- Smaller the particle, lesser the viscosity, More will be brownian motion or movement.

Ans of Q.No.7

Due to high electronegativity of nitrogen in ammonia, it associates its molecule by strong intermolecular hydrogen bond. Thus, Ammonia has high boiling point.

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Ans of Q.No.8

- Halogens are coloured because this is due to the absorption of radiation in the visible light which results in the excitation of their electron to higher energy level.
- By absorbing different quanta of energy, they display different colours.

For e.g.
Fluorine shows yellow, chlorine shows greenish yellow, etc.

Ans of Q.No. 9 (OR)

(i) IUPAC = Potassium hexacyanoferrate (II)

(ii) IUPAC = Hexaammine cobalt (III) chloride

प्रश्न क्र.

Ans of Q. No. 19

Difference between Lanthanoides and Actinoides

Lanthanoids	Actinoids
1. Last electron enters in 4f orbital or subshell of second last shell or anti-plenty made shell.	1. Last electron enters in 5f orbital or subshell of second last shell or antiplenty made shell.
2. Main oxidation state of Lanthanoids is +3. Along with +3, these can also show +2 and +4.	2. Actinoids show +3, +4, +5 and +6 oxidation states.
3. Lanthanoids compounds are less basic than actinoids compounds.	3. Actinoid compounds are more basic than lanthanoid compounds.

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4. Lanthanoids have poor tendency to form complex compounds.	4. Actinoids have more tendency to form complex compounds.
5. These do not form oxo ions.	5. These form oxo ions.

Ans of Q.No. 10 (OR)

Due to high electronegativity of nitrogen in amine, it forms intermolecular hydrogen bonding with H_2O water molecule.

Thus, amines are soluble in water.

M P B S E

प्रश्न क्र.

Ans of Q.No. 18

Kohlrausch's law

⇒ According to the 'Kohlrausch's law,

"Molar conductance of any electrolyte at infinite dilution is equal to the sum of individual cationic conductance and anionic conductance at infinite dilution."

For e.g.

$$\lambda_m^\infty = \lambda_{m+}^\infty + \lambda_{m-}^\infty$$

$$\lambda_{m(A_xB_y)}^\infty = x\lambda_{m(A^{y+})}^\infty + y\lambda_{m(B^{x-})}^\infty$$

such that:

$\lambda_{m(A_xB_y)}^\infty$ = molar conductance of electrolyte at infinite dilution.

$\lambda_{m(A^{y+})}^\infty$ = molar conductance of cation at infinite dilution.

$\lambda_{m(B^{x-})}^\infty$ = Molar conductance of anion at infinite dilution.

प्रश्न क्र.

M P B S E

For e.g.

$$\lambda^{\infty}_{m(NaCl)} = \lambda^{\infty}_{m(Na^+)} + \lambda^{\infty}_{m(Cl^-)}$$

$$\lambda^{\infty}_{m(MgCl_2)} = \lambda^{\infty}_{m(Mg^{2+})} + 2\lambda^{\infty}_{m(Cl^-)}$$

$$\lambda^{\infty}_{m(MgSO_4)} = \lambda^{\infty}_{m(Mg^{2+})} + \lambda^{\infty}_{m(SO_4^{2-})}$$

- Applications of Kohlrausch's law:

1. In calculation of molar conductance of weak electrolyte at infinite dilution

- Molar conductance of weak electrolyte at infinite dilution can not be obtained by graph-extrapolation method.

Thus, by knowing the molar conductance of strong electrolytes, molar conductance of weak electrolytes at infinite dilution can be obtained using Kohlrausch law.

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2. In calculation of degree of dissociation of weak electrolyte

• By knowing the molar conductance of weak electrolyte at 'c' concentration and molar conductance at '0' concentration ~~conductance~~, degree of dissociation of weak electrolyte can be obtained using the formula:

$$\alpha = \frac{\lambda_m^c}{\lambda_m^0}$$

λ_m^c: molar conductance at 'c' concentration.

λ_m^0: molar conductance at 0 concentration or infinite dilution.

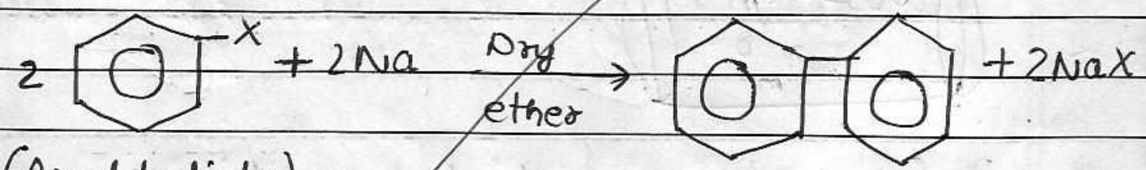
α: Degree of dissociation of weak electrolyte.

Ans of Q.No. 17 (OR)

(i) <u>Fittig reaction:</u>

When arylhalides react ~~in~~ with Sodium in the presence of dry ether, then diphenyl is formed. This reaction is called Fittig reaction.

<u>Reaction:</u>



(Aryl halide)

(Diphenyl)

(ii) <u>Hunsdiecker reaction</u>

when silver salt of fatty acids react with Bromine in the presence of Carbon tetrachloride (CCl_4), then bromoalkanes ~~are~~ formed or aryl bromide are formed. This reaction is called Hunsdiecker reaction.

प्रश्न क्र.

Reaction:

$CH_3COO[Ag + Br]-Br$

Silver salt of fatty acid — CCl_4 — Bromine

$CH_3Br + CO_2 + AgBr$

"bromomethane"

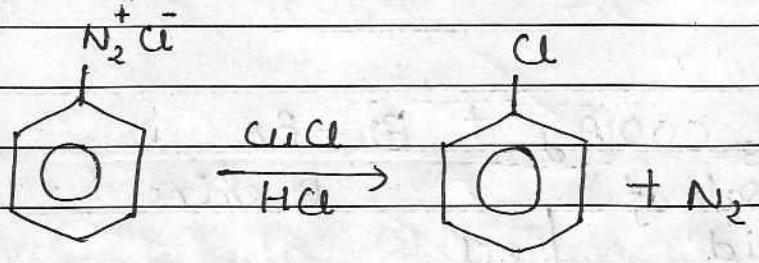
(iii) Sandmeyer's reaction

When benzene diazonium chloride reacts with cuprous chloride or bromide and its corresponding hydrogen chloride or Hydrogen bromide, then Chlorobenzene or bromobenzene are formed.

This reaction is called Sandmeyer reaction.

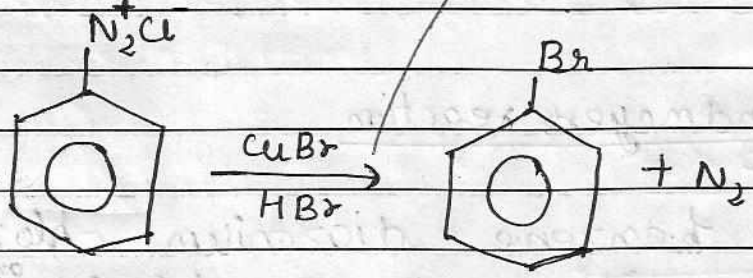
P.T.O.

Reaction:

1. 

Benzene diazonium chloride

chlorobenzene

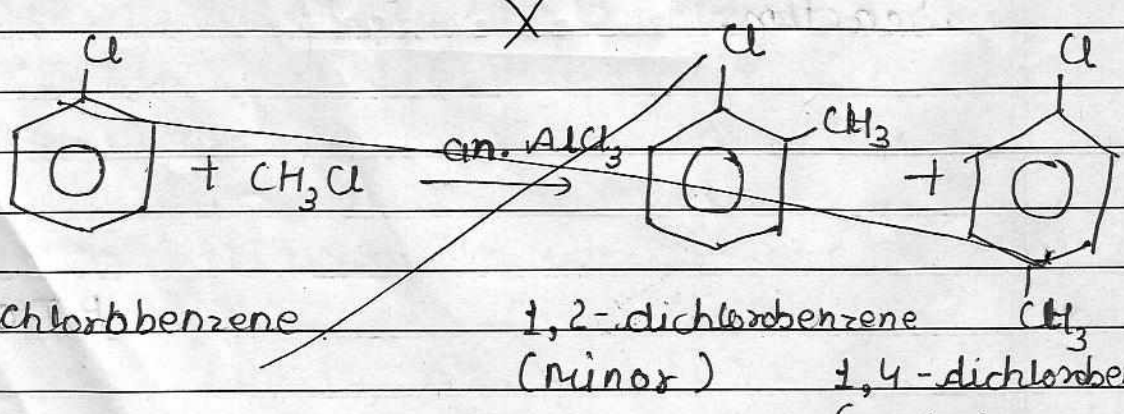
2. 

Benzene diazonium chloride

Bromobenzene

4. Freidel crafts reaction

~~2~~. Alkylation



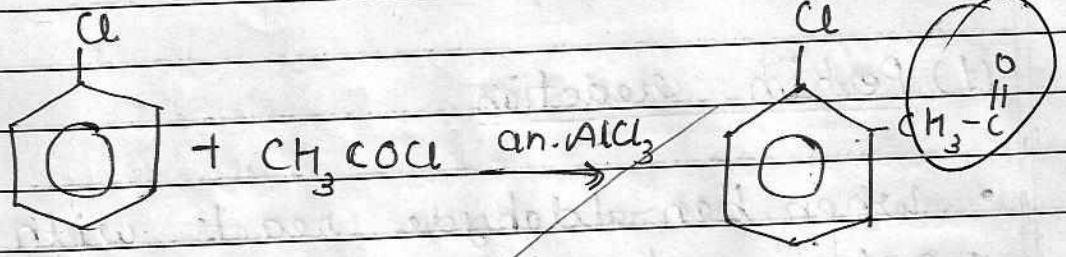
Chlorobenzene

1,2-dichlorobenzene (Minor)

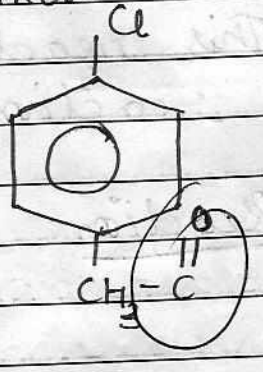
1,4-dichlorobenzene (Major)

प्रश्न क्र. 4. Freidel-Craft reaction

(b) Acylation

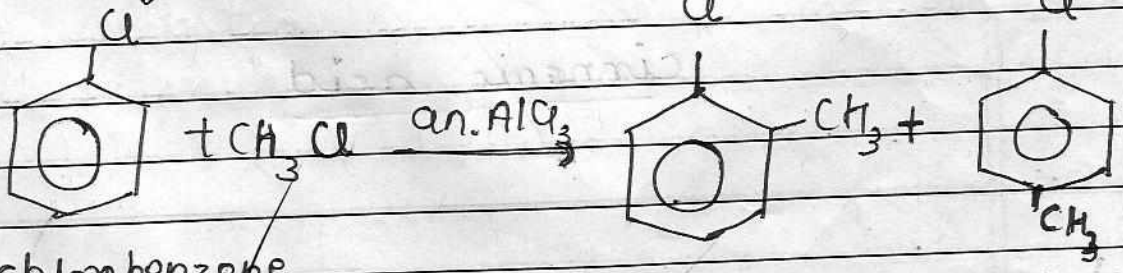


(2-chloroacetophenone)
(Minor)



(4-chloroacetophenone)
~~(Minor)~~
(Major)

(b) Alkylation:



chlorobenzene

1-chloro, 2-methyl benzene
(Minor)

(1-chloro, 4-methyl benzene
(Major)

प्रश्न क्र.

Ans of Q.No. 16 (OR)

(1) Perkin reaction

- When benzaldehyde reacts with acetic anhydride in the presence of sodium ethanoate, then "cinnamic acid is formed".
This reaction is called Perkin reaction.

Reaction:

$$C_6H_5CHO + (CH_3CO)_2O \xrightarrow{CH_3COONa} C_6H_5-CH=CHCOOH$$

Benzaldehyde — Acetic anhydride — "cinnamic acid"

प्रश्न क्र.

(29) **Cannizaro reaction**

Aldehydes which do not have alpha hydrogen undergo self oxidation and self reduction in the presence of concentrated NaOH. This reaction is called Cannizaro reaction.

Reaction:

- $HCHO + HCHO + \text{con.NaOH}$

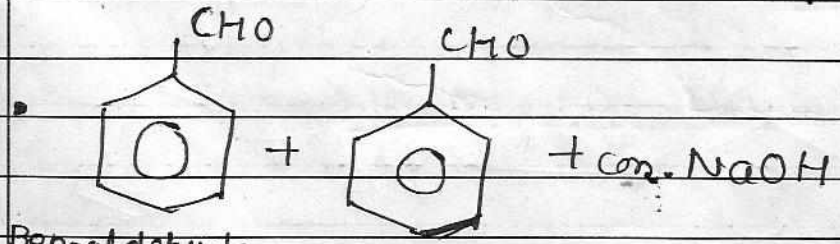
Formaldehyde

$\downarrow$

$HCH_2OH + HCOONa$

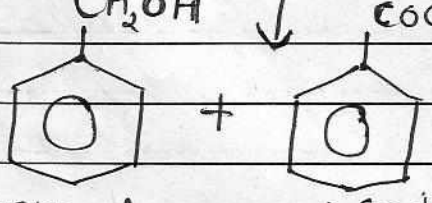
or CH_3OH (Sodium formate)

(methanol)

- 

Benzaldehyde

$\downarrow$



Benzyl alcohol

Sodium benzoate

(iii) Rosenmund reaction

When ethanoyl (alkanoyl) chloride reacts with hydrogen in the presence of $BaSO_4$ and Palladium (Pd), then aldehydes are formed.
This reaction is called "Rosenmund reaction."

Reaction :

$$R-CO-Cl + H-H$$
Alkanoyl chloride

$$\downarrow Pd/BaSO_4$$

$$R-CHO + HCl$$
Aldehyde

M
P
B
S
E

प्रश्न क्र.

Ans of Q.No. 15 (OR)

Reactions	Phenol	Alcohol
1. Coupling reaction with Benzene diazonium chloride	1. p-hydroxy azo benzene dye is formed.	1. Do not respond to the reaction.
2. Iodoform test	2. Do not give this test.	2. Responds to this test to form Iodoform.
3. Oxidation Reaction	3. Oxidises in the presence of air to form "phenoquinone" and colour turns pink.	3. Oxidises to form aldehyde and further forms carboxylic acids on further oxidation.

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Ans of Q No. 14 (OR)

• Pseudo first order reaction

• The reactions which seem to be of second order but actually are of first order are called Pseudo first order reactions.

• Sometimes, reaction conditions are altered by taking one reactant in excess. For e.g. when In hydrolysis of Sucrose, when the water is taken in excess, then only Sucrose contributes to the order of reaction and order of reaction will be first order.

Example:

1. Hydrolysis of Sucrose

$$C_{12}H_{22}O_{11} + H-OH \xrightarrow{H^+} C_6H_{12}O_6 + C_6H_{12}O_6$$

(Sucrose) (Glucose) [Fructose]

$$\text{Rate} = k\,[C_{12}H_{22}O_{11}]$$

Ans of Q.No. 13

Given :

Mass of NaCl (ω_B) = 5.85 gm

Molar mass of NaCl (M_B) = 23 + 35.5 = 58.5 gm

Mass of water (ω_A) = 250 gm

By the formula of molality,

$$m = \frac{\omega_B}{M_B} \times \frac{1000}{\omega_A}$$

$$m = \frac{5.85}{58.5} \times \frac{1000}{250} = \frac{1}{10} \times \frac{\cancel{1000}^{4}}{\cancel{250}}$$

$$\boxed{m = 0.4 \text{ mol kg}^{-1}}$$

Thus, molality of solution will be 0.4 molal or mol kg^{-1}.

ST-16A4

माध्यमिक शिक्षा म

परीक्षार्थी द्वारा भरा जायें ↓

4 पृष्ठीय

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

परीक्षा का दिनांक 28 02 2022

स्टीकर तीर के निशान ↓ से मिलाकर लगायें

माध्यमिकशिक्षामण्डल,म.प्र.,भोपाल,माध्यमिकशिक्षामण्डल,म.प्र.,भोपाल

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परीक्षार्थी का रोल नम्बर

अंकों में

2	2	2	6	2	5	4	6	6

शब्दों में

Two	Two	Two	Six	Two	Five	Four	Six	Six

PRADESHBHOPAL

माध्यमिकशिक्षामण्डल,म.प्र.,भोपाल

परीक्षार्थी द्वारा भरा जायें →

परीक्षा का नाम एवं परीक्षा केन्द्र क्रमांक की मुद्रा

परीक्षा केन्द्र क्रमांक-261004

पर्यवेक्षक का नाम एवं हस्ताक्षर

हायर सैकेण्डरी परीक्षा सन् 2022

केन्द्राध्यक्ष/सहायक केन्द्राध्यक्ष के हस्ताक्षर

मुख्य उत्तर पुस्तिका के अंतिम पृष्ठ क्रमांक .... तक कुल प्राप्तांक [ ] + [ ] = [ ]

प्रश्न क्र.

Ans of Q. No. 11 (OR)

DNA	RNA
1. It is made of Deoxyribose sugar	1. It is made Of Ribose sugar.
2. Nitrogenous bases present in DNA are Adenine (A), Guanine (G), Cytosine (C) and Thymine (T).	2. Nitrogenous bases present in RNA are Adenine (A), Guanine (G), Cytosine (C) and Uracil (U).

M P S E

पृष्ठ के अंकों का योग

P.T.O.

प्रश्न क्र.

Ans of Q. No. 12

Antibaitic examples are:

1. Penicillin
2. tetracyline