DPP - Daily Practice Problems

Name : _____ Date : _____

Start Time : _____ End Time : _____

CHEMISTRY 21

SYLLABUS : General Organic Chemistry-1 (Classification & Nomenclature)

Max. Marks : 120 **Time : 60 min.**

GENERAL INSTRUCTIONS

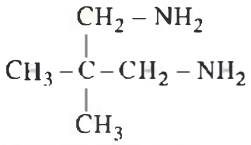
- The Daily Practice Problem Sheet contains 30 MCQ's. For each question only one option is correct. Darken the correct circle/ bubble in the Response Grid provided on each page.
- You have to evaluate your Response Grids yourself with the help of solution booklet.
- Each correct answer will get you 4 marks and 1 mark shall be deduced for each incorrect answer. No mark will be given/ deducted if no bubble is filled. Keep a timer in front of you and stop immediately at the end of 60 min.
- The sheet follows a particular syllabus. Do not attempt the sheet before you have completed your preparation for that syllabus. Refer syllabus sheet in the starting of the book for the syllabus of all the DPP sheets.
- After completing the sheet check your answers with the solution booklet and complete the Result Grid. Finally spend time to analyse your performance and revise the areas which emerge out as weak in your evaluation.

DIRECTIONS (Q.1-Q.21) : There are 21 multiple choice questions. Each question has 4 choices (a), (b), (c) and (d), out of which ONLY ONE choice is correct.

Q.1 How many 1° carbon atoms will be present in a simplest hydrocarbon having two 3° & one 2° carbon atoms?

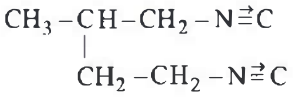
(a) 3 (b) 4 (c) 5 (d) 6

Q.2 Write the IUPAC name of the compound



(a) 2,3-dimethylpropanediamine-1,3
(b) 2-methylamino-2-methylbutanamine
(c) 2,2-dimethylpropandiamine-1,3
(d) None

Q.3 Write the IUPAC name of compound



(a) 2-methylbutanedi isonitrile-1,4
(b) 3-methylbutanedi isonitrile-1,4
(c) 3-methylbutanediisocyanide-1,4
(d) 3-ethylbutanediisonitrile-1,4

Q.4 Write IUPAC name of the following compound -

(a) 4-Hydroxycyclohex -2-en-1-one
(b) 5-Hydroxycyclohex -1-en-2-one
(c) 1-Hydroxycyclohex -2-en-4-one
(d) 4-Hydroxyhex -2-en-1-one

RESPONSE GRID	1. ⓐⓑⓒⓓ	2. ⓐⓑⓒⓓ	3. ⓐⓑⓒⓓ	4. ⓐⓑⓒⓓ

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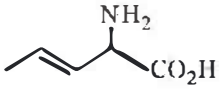
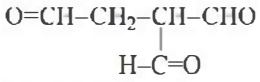
Q.5 Write IUPAC name of the following compound -



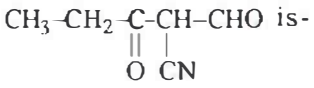
(a) 1-aminobut-2-en-1-oic acid
(b) 2-aminopent-3-en-1-oic acid
(c) 4-aminopent-2-en-5-oic acid
(d) 2-aminopent-4-en-1-oic acid

Q.6 The correct IUPAC name of the following compound is -



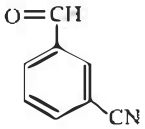
(a) 1,1-diformylpropanal
(b) 3- formylbutanedial
(c) 2-formylbutanedial
(d) 1,1,3-ethanetricarbaldehyde

Q.7 The correct IUPAC name of compound -



(a) 2-cyano-3-oxopentanal
(b) 2 - formyl-3-oxopentanenitrile
(c) 2-cyano-1, 3-pentanedione
(d) 1, 3-dioxo -2-cyanopentane

Q.8 Write IUPAC name of the following compound -



(a) 3-Formyl benzenecarbonitrile
(b) 3-Aldocyanobenzene
(c) 1-Cyanobenzaldehyde
(d) 1-Nitrile benzene-oxo

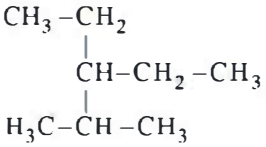
Q.9 The trivial name of the compound $CH_2 = CH - CN$ is-

(a) Vinyl cyanide (b) Cyano ethylene
(c) Acrylonitrile (d) 2 - propene nitrile

Q.10 The structure of isopropyl carbinol is : -

(a) $(CH_3)_2CHOH$ (b) $CH_3-CHOH-CH_2-CH_3$
(c) $(CH_3)_2CHCH_2OH$ (d) $(CH_3)_3OH$

Q.11 The IUPAC name of the following compound is



(a) 3 - isopropylpentane
(b) 2- methyl -3-ethylpentane
(c) 3 - ethyl -2-methylpentane
(d) 3 -ethyl -4-methylpentane

Q.12 The IUPAC name of the compound $CH_3CH = CHCH = CHC \equiv CCH_3$ is-

(a) 4, 6-octadien-2-yne
(b) 2, 4-octadien -6-yne
(c) 2-octyn - 4, 6-diene
(d) oct-6-yn-2, 4-diene

Q.13 The I.U.P.A.C. name of compound $(CH_3)_3C.CH_2CONH_2$ is

(a) 1, 1,1 - trimethylpropanamide
(b) 3, 3, 3-trimethylpropanamide
(c) 3, 3-dimethylbutanamide
(d) 3-t-butylpropanamide

Q.14 IUPAC name of the 4-carbon 3° amine is -

(a) Dimethylmethanamine
(b) N, N-dimethylethaneamine
(c) N-ethyl-N-methylmethaneamine
(d) Butanamine

Q.15 IUPAC name of compound $CH_3CH_2OCOCH_2CH_2CH_3$ is -

(a) Propyl propanoate (b) Ethyl butanoate
(c) Propyl butanoate (d) Ethyl propanoate

Q.16 Trivial name of 2, 3- dihydroxybutanedioic acid is -

(a) Malic acid (b) Tartaric acid
(c) Citric acid (d) Lactic acid

Q.17 IUPAC name of carbonyl chloride is -

(a) Phosgene
(b) Chloromethanoyl chloride
(c) Dichloroketone
(d) Dichloromethanone

RESPONSE GRID					
	6. ⓐⓑⓒⓓ	7. ⓐⓑⓒⓓ	8. ⓐⓑⓒⓓ	9. ⓐⓑⓒⓓ	10. ⓐⓑⓒⓓ
	11. ⓐⓑⓒⓓ	12. ⓐⓑⓒⓓ	13. ⓐⓑⓒⓓ	14. ⓐⓑⓒⓓ	15. ⓐⓑⓒⓓ
	16. ⓐⓑⓒⓓ	17. ⓐⓑⓒⓓ			

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Q.18 The structure of 2-nitro-1-propanamine is-

(a) $CH_2(NO_2)-CH_2-CH_2(NH_2)$

(b) $O=N-O-CH(CH_3)-CH_2-NH_2$

(c) $CH_3-CH(NO_2)-CH_2(NH_2)$

(d) $CH_3-CH(O-N=O)-CH_2(CH_3)$

Q.19 The IUPAC name of -

$CH_3-CH(CH_3)-C(=O)-CH(CH_3)-OH$

(a) 4 - methyl -2-hydroxy-3- pentanone

(b) 2-hydroxy -4- methyl-3- pentanone

(c) both are correct

(d) None

Q.20 The IUPAC name for -

$CH_2=C(Br)-CH(Cl)-C(=O)H$

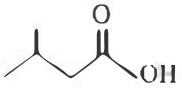
(a) 2-chloro-3- bromo-3-butenal

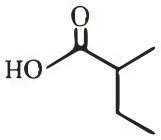
(b) 2-chloro-3-bromo-3-butene carbaldehyde

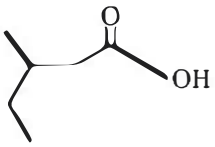
(c) 3-bromo-2-chloro-3-butenal

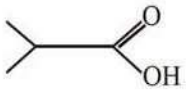
(d) 3-bromo-2-chloro-3-butenone

Q.21 Write the structural formula of the compound 3- methylbutanoic acid -

(a) 

(b) 

(c) 

(d) 

DIRECTIONS (Q.22-Q.24) : In the following questions, more than one of the answers given are correct. Select the correct answers and mark it according to the following codes:

Codes :

(a) 1, 2 and 3 are correct **(b)** 1 and 2 are correct

(c) 2 and 4 are correct **(d)** 1 and 3 are correct

Q.22 The formula C_nH_{2n-2} shows -

(1) Alkyne (2) Allene (3) Alkane (4) Alkene

Q.23 In which of the following tert. carbon is present?

(1) Iso-octane (2) 3-methylpentane

(3) Isopentane (4) Isopropyl amine

Q.24 An aromatic molecule will

(1) Have $(4n+2)$ π electrons

(2) planar

(3) be cyclic

(4) have $4n$ π electrons

DIRECTIONS (Q.25-Q.27) : Read the passage given below and answer the questions that follows :

Although most of the IUPAC rules of open chain compounds are applied to alicyclic compounds, certain points deserve special attention.

(i) In cycloalkenes, the numbering should be done in a direction that gives the lower number for the substituent attached on the double bond.

(ii) In case the alicyclic compound has functional group in the ring as well as in the side chain, the compound is considered as a derivative of that part in which principal functional group lies.

RESPONSE GRID					
	18. ⓐⓑⓒⓓ	**19.** ⓐⓑⓒⓓ	**20.** ⓐⓑⓒⓓ	**21.** ⓐⓑⓒⓓ	**22.** ⓐⓑⓒⓓ
	23. ⓐⓑⓒⓓ	**24.** ⓐⓑⓒⓓ			

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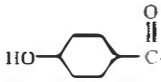
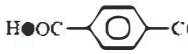
On the basis of the following seniority table for some of the principal groups, answer the questions given below.

Seniority table for principal groups

Group	Prefix name	Suffix name
–COOH	Carboxy–	–oic acid
–COOR	Alkyl-oxycarbonyl	–alkyl---oates
–COX	Haloformyl–	–oyl halide
$-CONH_2$	Carbamoyl–	amide
–CHO	Formyl–	–al
–OH	Hydroxy–	–ol
–X (halogen)	Halo–	–
R—	Alkyl–	–

25.  Its correct IUPAC name should be

(a) 4-acetamidocyclohexanol
(b) 4-(N-methylamido)cyclohexanol
(c) 4-hydroxy-N-methylcyclohexanecarboxamide
(d) 4-hydroxycyclohexaneacetamide

26.  The correct IUPAC name for the structure is :

(a) 4-carbamoylbenzoic acid
(b) 4-amidobenzoic acid
(c) 4-carboxybenzamide
(d) 4-acetamidobenzoic acid

27.  The correct IUPAC name for the structure is :

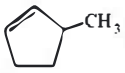
(a) 1, 2-dichlorocyclohexene
(b) 1, 6-dichlorocyclohexene
(c) 2, 3-dichlorocyclohexene
(d) any of the three

DIRECTIONS (Q.28-Q.30) : Each of these questions contains two statements: Statement-1 (Assertion) and Statement-2 (Reason). Each of these questions has four alternative choices, only one of which is the correct answer. You have to select the correct choice.

(a) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for Statement-1.
(b) Statement-1 is True, Statement-2 is True; Statement-2 is NOT a correct explanation for Statement-1.
(c) Statement - 1 is False, Statement-2 is True.
(d) Statement - 1 is True, Statement-2 is False.

Q.28 Statement-1:  is 3-methylbutanoic acid.

Statement-2 : In polyfunctional group, the substituent should be given lower number than the principal functional group.

Q.29 Statement-1 :  is 3-methylcyclopentene.

Statement-2 : In numbering, doubly bonded carbon atoms gets preference to the alkyl group in cycloalkenes.

Q.30 Statement-1 : Saturated hydrocarbons are chemically less reactive.

Statement-2 : All isomeric paraffins have same parent name.

RESPONSE GRID	25.ⓐⓑⓒⓓ 26.ⓐⓑⓒⓓ 27.ⓐⓑⓒⓓ 28.ⓐⓑⓒⓓ 29.ⓐⓑⓒⓓ 30.ⓐⓑⓒⓓ

DAILY PRACTICE PROBLEM SHEET 21 - CHEMISTRY			
Total Questions	30	Total Marks	120
Attempted		Correct	
Incorrect		Net Score	
Cut-off Score	44	Qualifying Score	68
Success Gap = Net Score – Qualifying Score			
Net Score = (Correct × 4) – (Incorrect × 1)			

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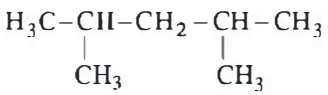
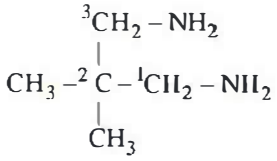
DAILY PRACTICE PROBLEMS

CHEMISTRY SOLUTIONS

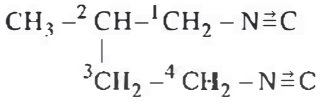
(21)

(1) **(b)** 

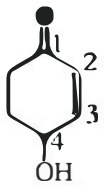
2, 4 - Dimethylpentane is the hydrocarbon having two 3° carbon & one 2° carbon atom. It has four 1° carbon atoms.

(2) **(c)** 

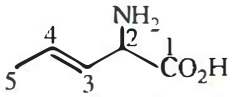
2,2-dimethylpropanediamine-1,3

(3) **(a)** 

2-methylbutanediisonitrile -1,4

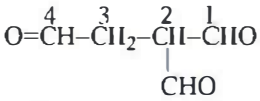
(4) **(a)** 

4-Hydroxycyclohex -2-ene-1-one

(5) **(b)** 

2-Aminopent-3-en-1-oic acid

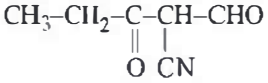
(6) **(c)** The IUPAC name of the given compound is 2-formyl-butanedial,



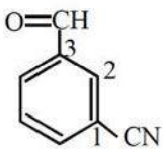
2-Formylbutanedial

The principal functional group is– CHO.

(7) **(b)** The correct I.U.P.A.C. name of



is 2-formyl-3-oxopentanenitrile. Here the main functional group is -CN, which has nitrile suffix and CHO and CO are the side functional groups which are used as prefixes.

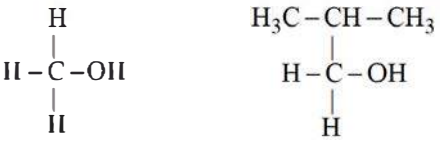
(8) **(a)** 

3-Formyl benzene carbonitrile

(9) **(c)** 3C + (=) → Acryl group

suffix of – CN group is onitrile.

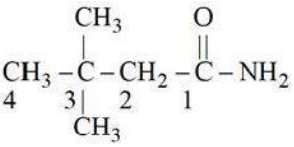
(10) **(c)** In derived name system



Carbinol Isopropyl carbinol

(11) **(c)** Select the longest chain having more substituents.

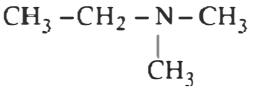
(12) **(d)** Between double bond & triple bond, double bond is preferred. The IUPAC name of the compound is oct-6-yn-2, 4-diene.

(13) **(c)** 

3, 3-dimethylbutanamide

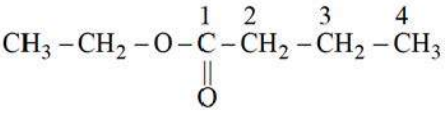
The principal functional group is

(14) **(b)** IUPAC name of the four-carbon 3° amine is N, N-dimethylethaneamine.



(N, N - dimethylethanamine)

(15) **(b)** The IUPAC name of $CH_3CH_2OCOCH_2CH_2CH_3$ is ethyl butanoate.



Ethyl butanoate

(16) **(b)** Trivial name of 2,3-dihydroxybutandioic acid is tartaric acid.

Tartaric acid

The principal functional group is– COOH group.

(17) **(b)** IUPAC name of carbonyl chloride is chloromethanoyl chloride.

(18) **(c)**

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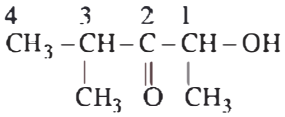
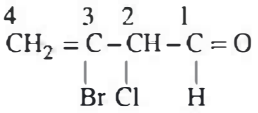
(19) **(d)** The principal group is $-\overset{\overset{O}{\|}}{C}-$ & the alphabate H of hydroxy group comes first than M of methyl group. So numbering is done in the following way.



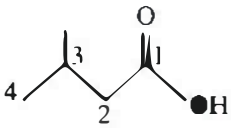
It should be 1-hydroxy-1, 3-dimethylbutan-2-one.

(20) **(c)**



3-bromo-2-chloro-3-butenal

(21) **(a)**

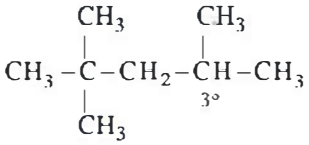


3-methylbutanoic acid

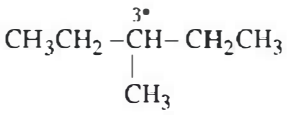
(22) **(b)** For acetylene (an alkyne) & allene, C_nH_{2n-2} formula is applicable completely.

$HC\equiv CH$ (C_2H_2) $\qquad$ $CH_2=C=CH_2$ (C_3H_4)

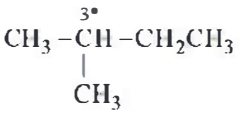
(23) **(a)**



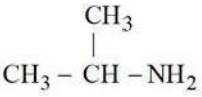
Iso-octane (one 3° C)



3-Methylpentane (one 3° C)



Isopentane (one 3° C)



Isopropyl amine (no 3°C)

(24) **(a)** An aromatic species will have :

$(4n+2)$ π electrons	(by Huckel's Rule)
planar structure	(due to resonance)
cyclic structure	(due to presence of sp^2-hybrid carbon atoms).

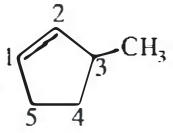
25. **(c)**

26. **(a)**

27. **(b)**

28. **(d)**

29. **(a)** In naming cycloalkenes, number the ring to give the doubly bonded carbons 1 and 2 and choose the direction of numbering so that the substituents get the lowest numbers. The position of the double bond is not indicated because it is known to be present between C-1 and C-2.

So,  is 3-methylcyclopentene

30. **(b)** Less reactivity of saturated hydrocarbons is due to peresence of single bonds between carbon atoms.

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