

Date : 02-07-2017

Time: 2 Hours

Maximum Marks : 140

Please read the instructions carefully. You are allotted 5 minutes specifically for this purpose.

GENERAL :

1. The sealed booklet is your Question Paper. Do not break the seal till you are instructed to do so.
2. The question paper CODE is printed on the right hand top corner of this sheet.
3. Use the Optical Response Sheet (ORS) provided separately for answering the question.
4. Blank spaces are provided within this booklet for rough work.
5. Write your Name and Roll Number in the space provided on the below cover.
6. After the open booklet, verify that the booklet contains all the 40 questions along with the options are legible.

QUESTION PAPER FORMAT AND MARKING SCHEME :

7. This questions paper consists of **TWO** sections.
8. Each section as detailed in the following table :

Section	Question Type	Number of Questions	Category-wise Marks for Each Question				Maximum Marks of the Section
			Full Marks	Partial Marks	Zero Marks	Negative Marks	
1	Single Correct Option	20	+3 If only the bubble corresponding to the correct option is darkened	-	0 If none of the bubbles is darkened	-1 In all other cases	60
2	One or More Correct Option(s)	20	+4 If only the bubble(s) corresponding to all the correct option(s) is(are) darkened	-	0 If none of the bubbles is darkened	-2 In all other cases	80

OPTICAL RESPONSE SHEET :

9. Darken the appropriate bubbles on the original by applying sufficient pressure.
10. The original is machine-gradable and will be collected by the invigilator at the end of the examination.
11. Don not tamper with or mutilate the ORS.
12. Write your name, roll number and the name of the examination centre and sign with pen in the space provided for this purpose on the original.
Do not write any of these details anywhere else. Darken the appropriate bubble under each digit of your roll number.

DARKENING THE BUBBLES ON THE ORS :

13. Use a **BLACK BALL POINT** to darken the bubbles in the upper sheet.
14. Darken the bubble **COMPLETELY**.
15. Darken the bubble **ONLY** if you are sure of the answer.
16. The correct way of darkening a bubble is as shown here : ●
17. There is **NO** way to erase or "un-darkened bubble.
18. The marking scheme given at the beginning of each section gives details of how darkened and **not darkened** bubbles are evaluated.

CHEMISTRY

Atomic masses : [H = 1, D = 2, Li = 7, C = 12, N = 14, O = 16, F = 19, Na = 23, Mg = 24, Al = 27, Si = 28, P = 31, S = 32, Cl = 35.5, K = 39, Ca = 40, Cr = 52, Mn = 55, Fe = 56, Cu = 63.5, Zn = 65, As = 75, Br = 80, Ag = 108, I = 127, Ba = 137, Hg = 200, Pb = 207]

SECTION – 1 : (Maximum Marks : 60)

- This section contains **TWENTY** questions
- Each question has **FOUR** options (A), (B), (C) and (D). **ONLY ONE** of these four option is correct
- For each question, darken the bubble corresponding to the correct option in the ORS
- Marking scheme :
 - +3 If only the bubble corresponding to the correct option is darkened
 - 0 If none of the bubble is darkened
 - 1 In all other cases

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1. The number of moles of atoms in 69 g of sodium is :
(A) 1 mol (B) 2 mol (C) 3 mol (D) 4 mol
2. A hypothetical gas A_2H_6 has molar mass 34 g/mol. What is the molar mass of A_2O_3 ?
(A) 64 g/mol (B) 82 g/mol (C) 80 g/mol (D) 76 g/mol

Space for Rough Work

3. The ratio of mass of oxygen to hydrogen in $(\text{NH}_4)_2\text{SO}_4$ is :
(A) 1:16 (B) 16 : 1 (C) 8 : 1 (D) 1:8

4. Neutrons were discovered by bombarding α -particles on a thin sheet of :
(A) Gold (B) Beryllium (C) Silver (D) Copper

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5. An organic compound contains Carbon, Hydrogen, Nitrogen and Oxygen. If from a sample of organic compound, all O-atoms were extracted and converted into O_2 gas, the gas occupied a volume of 22.4 L at STP. The number of O-atoms in one molecule of organic compound is :

(A) 4 (B) 2
(C) 1 (D) Cannot be determined

6. Mass of oxygen in 9.8 g H_2SO_4 sample is :
(A) 16 g (B) 4.5 g (C) 1.6 g (D) 6.4 g

7. Amongst the following e/m of anode rays is observed maximum when gas is filled in discharge tube.

(A) Ne (B) O_2 (C) N_2 (D) He

Space for Rough Work

8. x gram of FeO contains 112 gram iron. Calculate mass of Fe_3O_4 containing same amount of O as present in x gram FeO ?

- (A) 232 gram (B) 116 gram (C) 58 gram (D) 464 gram

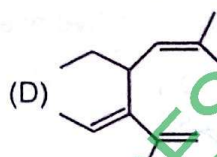
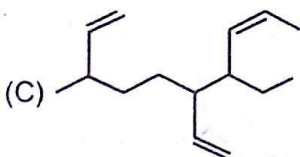
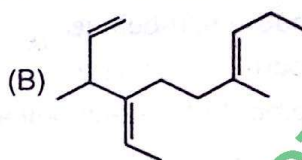
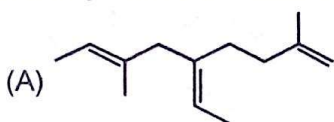
9. Ratio of mass numbers of two nuclei is 27 : 8, then ratio of radius of nuclei is :

- (A) 8 : 27 (B) 3 : 2 (C) 2 : 3 (D) 27 : 8

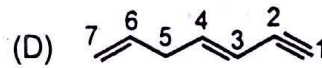
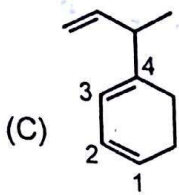
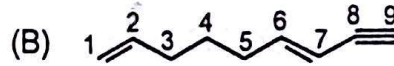
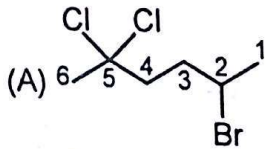
10. α -particles are projected towards Cu ($Z = 29$) (in experiment I), towards Au ($Z = 47$) (in experiment II) and towards Al ($Z = 13$) (in experiment III) with same velocity. If R_1 , R_2 and R_3 are distance of closest approach respectively, then select correct option :

- (A) $R_1 = R_2 = R_3$ (B) $R_1 > R_2 > R_3$
 (C) $R_3 < R_1 < R_2$ (D) $R_3 > R_1 > R_2$

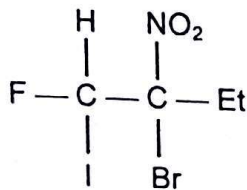
11. Identify correct structure of 4-ethylidene-3,7-dimethyldeca-1,7-diene



12. Given structure(s) with correct IUPAC numbering according to IUPAC rules is :

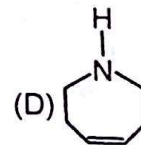
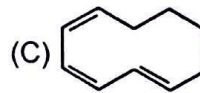
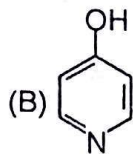
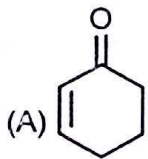


13. The correct IUPAC name of the following compound is :



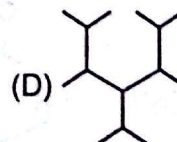
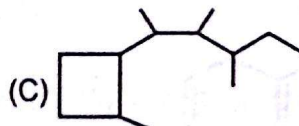
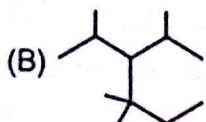
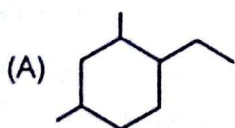
- (A) 1-Bromo-1-ethyl-2-fluoro-2-iodo-1-nitroethane
- (B) 3-Bromo-4-fluoro-4-iodo-3-nitrobutane
- (C) 2-Bromo-1-fluoro-1-iodo-2-nitrobutane
- (D) 1-Fluoro-1-iodo-2-bromo-2-ethyl-2-nitroethane

14. Which of the following is unsaturated hydrocarbon?

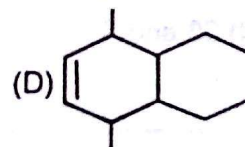
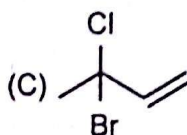
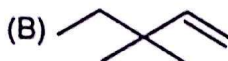
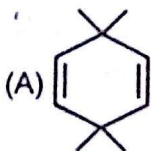


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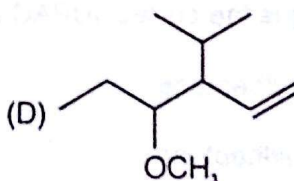
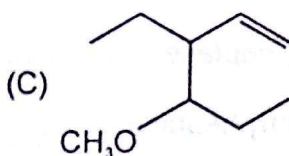
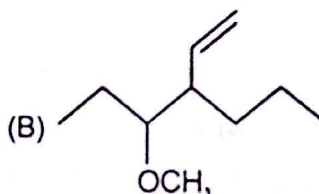
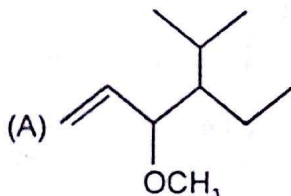
15. Which of the following compound has different word root than others?



16. Which of the following possess allylic H-atom?



17. Structure of 4-Methoxy-3-propylhex-1-ene is :



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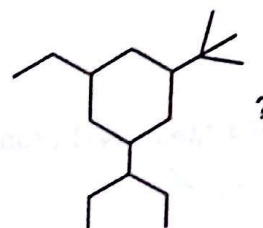
18. Number of σ and π bond in the following compound is :



- (A) 20 and 3
(B) 26 and 3
(C) 26 and 5
(D) 25 and 3

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19. How many 2° hydrogen atoms are present in the hydrocarbon



- (A) 6
(B) 3
(C) 12
(D) 4
20. Which of the following is the correct IUPAC name?
- (A) 3-Ethyl-4,4-dimethylheptane
(B) 4,4-Dimethyl-3-ethylheptane
(C) 5-Ethyl-4,4-dimethylheptane
(D) 4,4-Bis(methyl)-3-ethylheptane

Space for Rough Work

SECTION – 2 : (Maximum Marks : 80)

This section contains **TWENTY** questions

Each question has **FOUR** options (A), (B), (C) and (D). **ONE OR MORE THAN ONE** of these four option(s) is(are) correct

For each question, darken the bubble(s) corresponding to all the correct option(s) in the ORS

Marking scheme :

+4 If the bubbles corresponding to the answers are darkened

0 If none of the bubbles is darkened

-2 In all other cases

Which of the following statement(s) is/are correct ?

(A) The number of molecules in 1 g of H_2 gas is greater than the number of molecules in 2 g of O_2 gas.

(B) The number of atoms in 1 gram of an element is always not equal to the number of atoms in 1 gram-atom of an element. *is it equal?*

(C) The modern atomic mass unit is based on the mass of ^{12}C isotopes of carbon.

(D) RAM is unit less.

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7.5 grams of a gas occupy 5.6 litres of volume at STP. The gas is/are :

(A) NO

(B) N_2O

(C) C_2H_6

(D) CO_2

23. X and Y are the two elements which form XY_2 and X_2Y_3 . If 0.5 mole of X_2Y_3 weighs 80.0 g and 0.1 mole of XY_2 weighs 10.0 g. Then incorrect statement(s) is/are :
- (A) The gram atomic mass of X is 20 u (B) The atomic mass of Y is 40 g
(C) The gram atomic mass of Y is 40 u (D) The atomic mass of X is 20 u
24. Which of the following will contain same number of atoms as 12 g of magnesium:
- (A) 20 g calcium (B) 8 g oxygen gas
(C) 16 g oxygen atom (D) 6 g carbon
25. A gaseous mixture contains O_3 and N_2 in the ratio of 3 : 2 by mass. Then correct statement is/are
- (A) The ratio of their number of molecules is 8 : 7
(B) The ratio of their number of moles is 7 : 8
(C) The ratio of number of atoms is 16 : 21
(D) The ratio of their volume is 7 : 8 (under similar conditions of T & P)
26. Select the correct statement(s) :
- (A) The volume occupied by 0.25 mole H_2O at STP is 5.6 L.
(B) Among Sulphur dioxide, Ammonia, Carbon monoxide and Ozone, only two are compounds with atomicity equal to 3.
(C) The average molecular mass of a mixture of N_2 , CO and Ethene remains unchanged upon removal/addition of some amount of any of these gases.
(D) $d_{Kg/m^3} = d_{g/L} = d_{g/cc} \times 1000$.

Space for Rough Work

In Rutherford's scattering experiment, which of the following statement is/are correct ?

- (A) Most of the α -particles pass through gold foil without deflection
- (B) Most of the α -particles pass through the nucleus
- (C) Few α -particles are deflected back
- (D) α -particles going near the nucleus are slightly deflected.

18 g of glucose ($C_6H_{12}O_6$) are dissolved in 180 g of water in a glass. Then which of the following statement is/are incorrect ?

- (A) Glass contains 0.6 g-atoms of oxygen.
- (B) Glass contains 3.612×10^{23} g-atoms of carbon.
- (C) Glass contains 0.1 g-molecules of glucose.
- (D) Ratio of atoms of carbon to oxygen in glass is 1 : 1.

29. Which of the following statement(s) is/are incorrect ?

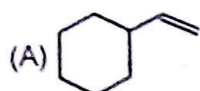
- (A) N^{3-} and Na^+ are isoelectronic species.
- (B) Rutherford's experiment, which established the nuclear model of the atom used a beam of helium atoms, which impinged on a metal foil and got scattered.
- (C) Proton is nearly 1836 times heavier than electron
- (D) The potential energy of a system consisting of two same charges decreases as the separation between charges decreases.

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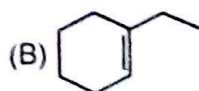
30. Identify the correct statement(s) :

- (A) Cathode rays produce heating effect when they collide with a metal object.
 (B) Anode rays consists of fast moving photons
 (C) For production of cathode rays in a discharge tube, the gas filled should be at a very high pressure
 (D) The magnitude of e/m ratio for Cathode rays is 1.76×10^8 C/g

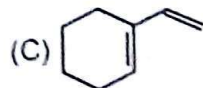
31. Which of the following IUPAC names are correctly match?



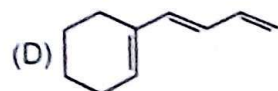
Cyclohexylethene



1-Ethylcyclohex-1-ene

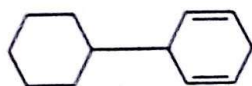


1-Ethenylcyclohex-1-ene



1-Cyclohex-1-enylbuta-1, 3-diene

32. The correct statement about the following compound is/are :



(A) Degree of unsaturation is 4

(B) Number of vinylic hydrogen = 4

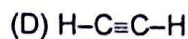
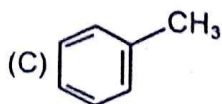
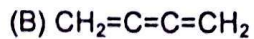
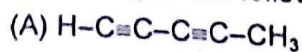
(C) Number of allylic hydrogen = 3

(D) IUPAC name: 3-cyclohexylcyclohexa-1,4-diene

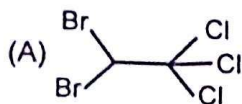
Space for Rough Work

33. Which of the following IUPAC name is/are correct ?
 (A) 1, 4-Diethyl-2-methyl-5-propyl cyclohexane (B) 2-Chloro-4, 4-dimethyl hexane
 (C) Hepta-3,6-dien-1-yne (D) Hepta-1,4-dien-6-yne

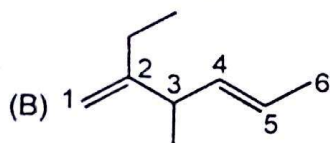
34. How many of the following show general formula C_nH_{2n-6} ?



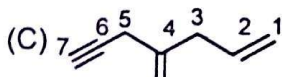
35. Which of the following is/are correct IUPAC name?



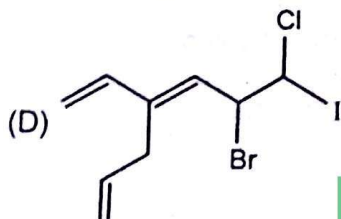
2,2-Dibromo-1,1,1-trichloroethane



2-Ethyl-3-methylhexa-1,4-diene



4-Methylenehept-1-en-6-yne

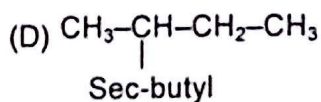
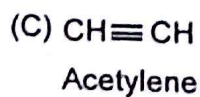
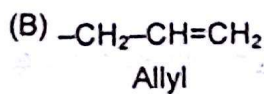
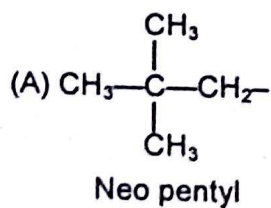


6-Bromo-7-chloro-4-ethenyl-7-iodohepta-1,4-diene

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Space for Rough Work

36. Which of the following common names is/are correct for given species:



37. The correct statement(s) about the following compound is/are :



(A) Number of sp^2 C-atoms is 6

(B) Number of allylic hydrogens is 5

(C) 3° -Amine functional group is present.

(D) It is a homocyclic compound.

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38. Which of the following IUPAC name is/are correct :

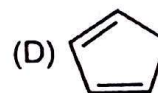
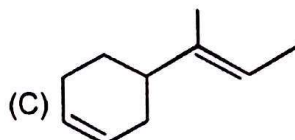
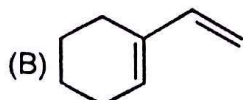
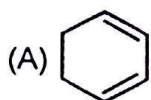
(A) $\text{CH}_3-\underset{\text{CH}_3}{\text{CH}}-\text{CH}_2-\text{CH}_2-\underset{\text{CH}_3}{\text{CH}}-\underset{\text{CH}_3}{\text{CH}}-\text{CH}_2-\text{CH}_3$ as (3,4,7-Trimethyloctane).

(B) $\text{CH}_3-\text{CH}_2-\underset{\text{CH}_3}{\text{CH}}-\text{CH}_2-\underset{\text{C}_2\text{H}_5}{\text{CH}}-\text{CH}_3$ as (2-Ethyl-4-methylhexane).

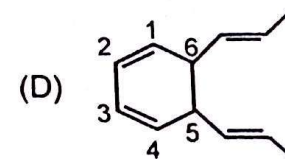
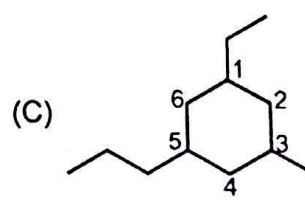
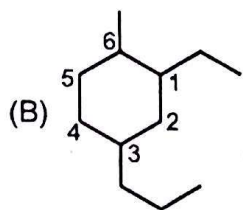
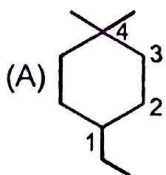
(C) $\text{CH}_3-\underset{\text{CH}_3}{\text{C}}(\text{CH}_3)-\text{CH}_2-\underset{\text{H}}{\text{C}}(\text{CH}_3)-\text{CH}_3$ as (2,2,4-Trimethylpentane)

(D) $\text{CH}_3-\underset{\text{CH}_2}{\underset{\text{CH}_3}{\text{CH}}}-\text{CH}_2-\underset{\text{CH}_2}{\underset{\text{CH}_3}{\text{CH}}}-\text{CH}_3$ as (3,5-Dimethylheptane)

39. Which of the following compound(s) has/have conjugated diene ?



40. In which of the following compound IUPAC numbering is incorrect ?



Space for Rough Work