21. For a chemical reaction

$A + B \rightarrow C$

the following data are found

Initial rate ($mol\ l^{-1}s^{-1}$)	Initial conc of **A** ($mol\ l^{-1}$)	Initial conc of **B** ($mol\ l^{-1}$)
0·02	0·5	0·5
0·08	1·0	0·5
0·16	1·0	1·0

Find the correct rate expression from the code given below :

(A) $k[A]^2[B]$

(B) $k[A][B]^2$

(C) $k[A][B]$

(D) $k[A]^2$

22. Given below are two statements, one lebelled as Assertion (Ass) and the other as Reason (R). Examine them and select your answer from the codes given below :

Assertion (Ass) : Bonding between soft acids and soft bases is predominantly covalent.

Reason (R) : The low oxidation states, larger sizes and easy polarizability of soft acids favour Π-bonding with soft bases.

Codes :

(A) Both (Ass) and (R) are true and (R) is the correct explanation of (Ass)

(B) Both (Ass) and (R) are true but (R) is not the correct explanation of (Ass)

(C) (Ass) is true but (R) is wrong

(D) (Ass) is wrong but (R) is true

23. Match the entries in Column-I with those in Column-II and find the correct match using the codes given below :

Column-I	**Column-II**
(a) Copper acetate	1. Polymeric
(b) Tetrasulphur tetranitride	2. Crown shaped
(c) Sulphur (cyclo)	3. Dimeric
(d) Beryllium chloride	4. Cradle shaped

Codes :

	(a)	(b)	(c)	(d)
(A)	1	2	3	4
(B)	4	3	2	1
(C)	3	2	4	1
(D)	3	4	2	1

24. The species exhibiting the lowest carbonyl stretching frequency $\left(\nu_{c-0}\, cm^{-1}\right)$ is

(A) $[(C_5H_5)Fe(CO)_3]^+$

(B) $[(C_5H_5)V(CO)_3]^{2-}$

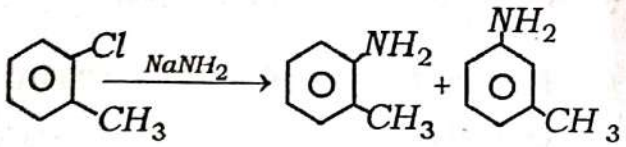
(C) $[(C_5H_5)Cr(CO)_3]^-$

(D) $[(C_5H_5)Mn(CO)_3]^0$

25. Given below are two statements, one labelled as Assertion (Ass) and the other as Reason (R). Pick out the correct conclusion from the codes given below :

Assertion (Ass) :

2-Chlorotoluene on treatment with sodamide gives a mixture of ortho and meta toluidines.



Reason (R) : Chloro arenes on treatment with strong base form aryne as a reactive intermediate. A nucleophilic addition to aryne gives the final product.

Codes :

(A) Both (Ass) and (R) are wrong

(B) (Ass) is correct but (R) is wrong

(C) (Ass) is wrong but (R) is correct

(D) Both (Ass) and (R) are correct

26. Some of the following statements are correct and others are wrong. Read them carefully and pick out the correct answer from the codes given below :

(1) [4+2] cyclo addition reactions are 100p.c. atom efficient reactions.

(2) Meerwein-Pondorf-Verley reduction is a chemoselective reaction for reducing esters $R\,COOR$ to alcholols $R\,CH_2OH$.

(3) Wohl-Ziegler reaction performs allylic bromination

(4) Hofmann bromide reaction is an example of intramoleculer cationotropic 1,2-shift

Codes :	(1)	(2)	(3)	(4)
(A)	True	True	False	False
(B)	True	False	True	False
(C)	False	False	True	False
(D)	True	True	True	False

27. Match each of the items given in List I with those given in List II and find the correct answer from the codes given below :

List-I	List-II
(1) Odd carbon alkanes	(i) Wittig reaction
(2) Oxidation of a 2°-alcohol to Ketone	(ii) Knoevenagel's reaction
(3) Conversion of a Ketone to an alkene	(iii) Oppenomer's oxidation
(4) Synthesis of $\alpha\beta$-unsaturated carboxylic acids	(iv) Corey-Honse synthesis

Codes :	(1)	(2)	(3)	(4)
(A)	(iv)	(iii)	(i)	(ii)
(B)	(iii)	(iv)	(i)	(ii)
(C)	(iv)	(i)	(ii)	(iii)
(D)	(ii)	(iii)	(iv)	(i)

28. **Assertion (Ass) :** The melting point of ice is much higher than that of H_2S.

Reason (R) : The lower negativity of S prevents appreciable hydrogen bonding accounting for melting point of H_2S than that of ice.

Codes :

(A) Both (Ass) and (R) are false

(B) Both (Ass) and (R) are true and (R) is the correct explanation of (Ass)

(C) (Ass) is true but (R) is false

(D) (Ass) is false but (R) is true

29. Match the items in Column-I with those in Column-II and select the correct match using the codes given below :

Column-I	Column-II
(a) $(\partial U/\partial S)_V$	1. V
(b) $(\partial U/\partial V)_S$	2. $-S$
(c) $(\partial G/\partial P)_T$	3. T
(d) $(\partial G/\partial T)_P$	4. $-P$

where U=Internal Energy ; G=free energy ; P=pressure ; V= volume ; T=Temperature and S=entropy

Codes :	(a)	(b)	(c)	(d)
(A)	2	3	4	1
(B)	3	4	1	2
(C)	4	1	2	3
(D)	1	2	3	4

30. If the specific rate constant 'K' is to be equal to the pre-exponential factor 'A' in Arrhenius equation, then

(A) the reaction temperature is very low

(B) the reaction is a catalysed one

(C) the reaction is molecular in nature

(D) the reaction does not need any activation energy