# MOMENTUM 

## CHEMISTRY

(24 Feb 2021) Shift-2

1. Compare the rate of aromatic nucleophilic substitution reaction of the following compounds

(I)

(II)

(III)

(IV)
(1) IV $>$ II $>$ III $>$ I
(2) III $>$ II $>$ I $>$ IV
(3) I $>$ II $>$ III $>$ IV
(4) IV $>$ III $>$ II $>$ I
2. What is $S$ in Buna- $S$ ?
(1) Sulphure
(2) Styrene
(3) Rubber
(4) Strength
3. Which of the following set of the reagent is used to convert nitrobenzene 1,3-Dibromobenzene ?
(1) $\mathrm{Br}_{2} / \mathrm{Fe} \longrightarrow \mathrm{Sn} / \mathrm{HCl} \longrightarrow \mathrm{NaNO}_{2} / \mathrm{HCl} \longrightarrow \mathrm{CuBr} / \mathrm{HBr}$
(2)
(3)
(4)
4. The reagent used to convert the following is ?

(1) $\mathrm{NH}_{2}-\mathrm{NH}_{2} / \mathrm{C}_{2} \mathrm{H}_{5} \mathrm{O}^{-} \mathrm{Na}^{\oplus}$
(2) Red $\mathrm{P} / \mathrm{Cl}_{2}$
(3) $\mathrm{Ni} / \mathrm{H}_{2}$
(4) $\mathrm{NaBH}_{4}$
5. Match the following

## Column - I

(a) Valium
(b) Morphine
(c) Norethindrone
(d) Vitamin B-12

## Column - II

(p) Pernicious anaemia
(q) Analgesic
(r) Tranquilizer
(s) Antifertility
6. Statement-I : BOD is the parameter that can be helpful for survival of aquatic life.

Statement-II : Optimum value of BOD is 6.5 ppm .
(1) Statement I is true, Statement II is false
(2) Statement I is false, Statement II is true
(3) Stetement I, II both are true
(4) Statement I, II both are false
7. How many of the following amines can be prepared by Gabriel phthalimide synthesis ?
(1)

(2)

(3) $\mathrm{CH}_{3}-\mathrm{NH}_{2}$
(4) $\mathrm{CH}_{3}-\mathrm{CH}_{2}-\mathrm{NH}_{2}$
8. Which of the following compound cannot be prepared by the reaction of alkyne with $\mathrm{HgSO}_{4} / \mathrm{dil}_{2} \mathrm{H}_{2} \mathrm{SO}_{4}$ ?
(1) $\mathrm{CH}_{3} \mathrm{CHO}$
(2) $\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CHO}$
(3) $\mathrm{CH}_{3} \mathrm{COCH}_{2} \mathrm{CH}_{3}$
(4)

9. Diazonium salt of which of the following will give coloured dye on reaction with $\beta-\mathrm{Napthol}$ in NaOH
(1)

(2)

(3)

(4)

10. The correct bond angle \& shape of $\mathrm{I}_{3}^{-}$is
(1) Linear \& $180^{\circ}$
(2) Trigonal pyramidal \& $120^{\circ}$
(3) V-shape \& $120^{\circ}$
(4) T-shape \& $109^{\circ} 28^{\prime}$
11. Correct statements
(a) K.E. $\propto \frac{z^{2}}{n^{2}}$
(b) (nv) $\propto z^{2}$
(c) Frequency $\propto \frac{z^{3}}{n^{3}}$
(d) Electrostatic force $\propto \frac{z^{3}}{n^{4}}$
(1) a \& d are correct
(2) a \& b are correct
(3) b \& c are correct
(4) b \& d are correct
12. Which of the following is incorrect?
(1) $\mathrm{Cr}_{2} \mathrm{O}_{3}$ is amphoteric
(2) $\mathrm{RuO}_{4}$ is oxidising agent
(3) $\mathrm{VOSO}_{4}$ is reducing agent
(4) Ruby appears due to presence of $\mathrm{Co}^{3+}$
13. Which of the following order of melting point is correct
(1) $\mathrm{LiF}>\mathrm{LiCl}, \mathrm{NaCl}>\mathrm{MgO}$
(2) $\mathrm{LiF}<\mathrm{LiCl}, \mathrm{NaCl}>\mathrm{MgO}$
(3) $\mathrm{LiF}>\mathrm{LiCl}, \mathrm{NaCl}<\mathrm{MgO}$
(4) $\mathrm{LiF}<\mathrm{LiCl}, \mathrm{NaCl}>\mathrm{MgO}$
14. Spin only magnetic moment of the following complexes
$\left[\mathrm{FeCl}_{4}\right]^{2-},\left[\mathrm{CO}(\mathrm{ox})_{3}\right]^{3-}, \mathrm{MnO}_{4}^{2-}$
(1) 4.9, 0, 1.76 BM
(2) $5.9,1.73 \mathrm{BM}$
(3) 1.73, 2.83, 0 BM
(4) 2.83, 6.9, 0 BM
15. $\alpha$ - sulphur, $\beta$ - sulphur, $\mathrm{S}_{2} \rightarrow$ find how many are paramagnetic
16. Which of the following can be used for clotting of blood efficiently ?
(1) $\mathrm{NaHCO}_{3}$
(2) $\mathrm{FeCl}_{3}$
(3) $\mathrm{FeSO}_{4}$
(4) $\mathrm{Mg}\left(\mathrm{HCO}_{3}\right)_{2}$
17. $3 \mathrm{C}_{2} \mathrm{H}_{2} \rightleftharpoons \mathrm{C}_{6} \mathrm{H}_{6}(\ell)$
given that

$$
\begin{aligned}
& \mathrm{G}_{\mathrm{m}}^{\circ}\left(\mathrm{C}_{2} \mathrm{H}_{2}\right)=2.4 \times 10^{5} \mathrm{~J} \\
& \mathrm{G}_{\mathrm{m}}^{\circ}\left(\mathrm{C}_{6} \mathrm{H}_{6}\right)=-1.4 \times 10^{5} \mathrm{~J}
\end{aligned}
$$

Find $\log _{10} \mathrm{k}$ at $25^{\circ} \mathrm{C}$
18. 1.86 gm of aniline is converted into acetanilide with $90 \%$ efficiency. Mass of acetanilide formed is $[X] \times 10^{-2}$ gm
19. Freezing point of $\mathrm{C}_{6} \mathrm{H}_{6}(\ell)$ is $5.5^{\circ} \mathrm{C}$. If 10 g of $\mathrm{C}_{4} \mathrm{H}_{10}$ is mixed with 200 g of $\mathrm{C}_{6} \mathrm{H}_{6}(\ell)$. Calculate freezing point of solution $\mathrm{k}_{\mathrm{f}}=5.12^{\circ} \mathrm{C} / \mathrm{m}$.
20. De-broglie's wavelength of a•proton and an $\alpha$-particle is same. Caculate ratio of their velocities
21. If $\left[\mathrm{H}^{+}\right]$changed from 1 M to $10^{-4} \mathrm{M}$

Find change in electrode potential $\mathrm{E}_{\mathrm{MnO}_{4}^{-} / \mathrm{Mn}^{+2}}^{\circ},\left(\frac{\mathrm{RT}}{\mathrm{F}}=0.059\right)$
[Assume $\left.\left[\mathrm{MnO}_{4}^{-}\right]=\left[\mathrm{Mn}^{+2}\right]=1 \mathrm{M}\right]$
22. V ml of a hydrocarbon $\mathrm{C}_{x} \mathrm{H}_{y}$ requires 6 V ml of oxygen for complete combustion \& forms 4 V ml of $\mathrm{CO}_{2}$. Determine y
23. Sucrose $\xrightarrow{\text { lorder }}$ Glucose + Fructose
$\mathrm{t}_{1 / 2}=3.33$ hour
$f=$ fraction remaining of sucrose at 9 hour.
Find out value of $100 \times \log \left(\frac{1}{f}\right)$

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\left[\log _{10} 2=0.3\right]
$$

