# NEET (UG) GRAND TEST <br> No. of Questions: 180 <br> 3) $\mathrm{Ce}^{2+}$ 4) $\mathrm{Sm}^{+2}$ 

[Each Question carries 4 marks. For each incorrect response, one mark will be deducted]

## నిన్నటి ‘విద్య’ తరువాయి

121. One mole of an ideal gas at an initial temperature of TK does 6 R joules of work adiabatically. If $\gamma=\frac{5}{3}$, the final temperature of gas will be
1) $(\mathrm{T}+2.4) \mathrm{K} \quad 2)(\mathrm{T}-4) \mathrm{K}$
2) $(T+4) K$
3) (T-2.4)K
122. A carnot engine whose sink is at 300k has an efficiency of $40 \%$. By how much should the temperature of source be increased so as to increase its efficiency by $50 \%$ of original efficiency?
1) 380 K
2) 275 K
3) 100 K
4) 250 K
123. In case of a soap bubble, the ratio of work done to double the radius, double the surface area and double the volume is
1) $1: 2: 3 ~ 2) ~ 2: 4: 8$
2) $3: 1:\left(2^{1 / 3}-1\right)$
3) $3: 4: 5$
124. There is a opening of area ' $a$ ' near the bottom of a vessel containing liquid upto height $h$. The density of the liquid is $\rho$. A disc is held against the opening to keep the liquid from running out. The liquid exerts a force $\mathrm{F}_{1}$ on the disc. Now the disc is moved from the opening a short distance. The emerging liquid strikes the disc with a force $\mathrm{F}_{2}$. Then $\frac{F_{1}}{F_{2}}$ is

1) $1 \begin{array}{llll}1 & \text { 2) } 2 & 3) 1 / 2 & 4) 4\end{array}$
125. Two charges each of charge $+10 \mu \mathrm{c}$ are kept on y -axis at $\mathrm{y}=$ -a and $\mathrm{y}=+\mathrm{a}$ respectively. Another point charge $-20 \mu \mathrm{c}$ is place at the origin and given a small displacement $x(x \ll \mathrm{a})$ along $x$ - axis. The force acting on the point charge is ( x and a are in meters)

$$
\begin{array}{ll}
\text { 1) } \frac{3.6 x}{\mathrm{a}^{2}} \mathrm{~N} & \text { 2) } \frac{2.4 x^{2}}{\mathrm{a}} \mathrm{~N} \\
\text { 3) } \frac{3.6 x}{\mathrm{a}^{3}} \mathrm{~N} & \text { 4) } \frac{4.8 x}{\mathrm{a}^{2}} \mathrm{~N}
\end{array}
$$

126. A region contains a uniform electric field $\overrightarrow{\mathrm{E}}=(10 \hat{\mathrm{i}}+30 \hat{\mathrm{j}}) \mathrm{Vm}^{-1}$ A and B are two points in the field at $(1,2,0) \mathrm{m}$ and $(2,1,3) \mathrm{m}$ are respectively. The work done when a charge of 0.8 c moves from A to B in a parabolic path is
$\begin{array}{llll}1) & 4 \mathrm{~J} & 2) & 40 \mathrm{~J} \\ \text { 3) } 16 \mathrm{~J} & 4) \\ 80 \mathrm{~J}\end{array}$
127. A galvanometer can be converted into a voltmeter to measure upto V volts connecting by a resistance $\mathrm{R}_{1}$ in series with coil, $\frac{\mathrm{V}}{2}$ volts by connecting a
resistance $\mathrm{R}_{2}$ in series with the same coil. The resistance $R$ required to obtain a voltmeter that can be read upto 2 V volts is
1) $R_{1}-2 R_{2} \quad$ 2) $3 R_{1}-R_{2}$
2) $R_{1}-R_{2} \quad$ 4) $3 R_{1}-2 R_{2}$
128. A man is watching two trains one leaving and the other coming in with equal speed of $3 \mathrm{~ms}^{-}$ ${ }^{1}$. If they sound their whistles with equal frequency of 220 Hz , the number of beats heard by the man will be ( $\mathrm{V}_{\text {sound }}=$ $330 \mathrm{~ms}^{-1}$ )
$\begin{array}{llll}\text { 1) } 6 & \text { 2) } 3 & \text { 3) } 4 & \text { 4) } 1\end{array}$
129. The blocks $P, Q$ and $R$ have masses $2 \mathrm{Kg}, 4 \mathrm{Kg}$, and 4 Kg respectively. They are connected as shown by mass less strings. The surface is smooth. The area of cross-section of the string is $0.004 \mathrm{~cm}^{2}$ and youngs modulus is $4 \times 10^{5} \mathrm{Nm}^{-2}$ then the longitudinal strain in string B is

1) $2 \times 10^{-2} \quad$ 2) $3 \times 10^{-2}$
2) $1.5 \times 10^{2}$ 4) $2.5 \times 10^{2}$
130. A Homogeneous solid sphere of radius 0.2 m and mass 5 k rotates about its diameter. Angular velocity of the sphere as a function of time ' t ' is given by the formula $\omega=(3+5 t) \mathrm{rads}^{-1}$. The tangential force applied to the sphere is
1) $1 \mathrm{~N} \quad$ 2) $3 \mathrm{~N} \quad$ 3) $2 \mathrm{~N} \quad 4$ ) 4 N
131. Two resistors of resistances $R_{1}$ $=(100 \pm 3) \Omega$ and $R_{2}=(200 \pm$ 4) $\Omega$ are connected in parallel. The equivalent resistance of the parallel combination is
1) $(66.7 \pm 1.8) \Omega$
2) $(66.7 \pm 4) \Omega$
3) $(66.7 \pm 3) \Omega$ 4) $(66.7 \pm 7) \Omega$
132. A Microscope consists of two convex lenses of focal lengths 25 cm and 6.25 cm placed 15 cm apart. The distance of object from the objective so that the final virtual image is at a distance of 2 cm from the eye is $\begin{array}{ll}\text { 1) } 1.5 \mathrm{~cm} & \text { 2) } 2 \mathrm{~cm}\end{array}$ 3) $2.5 \mathrm{~cm} \quad$ 4) 3 cm
133. If $C, R, L$ and I denote Capacity, Resistance, Inductance and electric current respectively, the quantities having the same dimensions of time are
a) $C R$
b) $\frac{L}{R}$
c) $\sqrt{ } \mathrm{LL}$
d) $\mathrm{LI}^{2}$
1) a,b only 2) a,c only
2) a,d only 4) a,b,c only
134. In the presence of air resistance, a ball thrown vertically upwards with velocity of $12 \mathrm{~ms}^{-1}$ returns ground with velocity of $10 \mathrm{~ms}^{-1}$. The
maximum height reached by the ball is? ( $\mathrm{g}=10 \mathrm{~m} / \mathrm{s}$ )
1) $7.2 \mathrm{~m} \quad$ 2) 5 m
2) 6.1 m
3) 12.2 m
135. The equation of a stationary wave is $\mathrm{y}=4 \sin \left(\frac{\pi x}{10}\right) \cos (100 \pi \mathrm{t})$ where $x$ is in cm and t is in seconds. Phase difference between two points lying at $x=8$ cm and $x=12 \mathrm{~cm}$ is
1) $\pi \mathrm{rad}$
2) $\frac{2 \pi}{5} \mathrm{rad}$
3) Zero
4) $2 \pi r$

## CHEMISTRY

136. Select the correct statement regarding alkali metals
1) $\mathrm{Li}_{2} \mathrm{CO}_{3}$ is water soluble and cannot decompose on heating
2) $\mathrm{LiHCO}_{3}$ is a crystalline water insoluble solid
3) $\mathrm{Na}_{2} \mathrm{CO}_{3}$ is water soluble where as $\mathrm{K}_{2} \mathrm{CO}_{3}$ is water in soluble
4) An aqueous solutions of $\mathrm{Na}_{2} \mathrm{CO}_{3}$ is alkaline in nature
137. Radius difference between the following atoms is least
1) $\mathrm{B} \& \mathrm{~A} l$ 2) $\mathrm{A} l \& G a$ 3) $\mathrm{Ga} \& \mathrm{In}$ 4) B and Ga
138. Hydrolysis followed by polymerisation of the following gives a linear silicon polymer
1) $\mathrm{R}_{3} \mathrm{SiCl} \quad$ 2) $\mathrm{R}_{2} \mathrm{SiCl}_{2}$
2) $\mathrm{RSiCl}_{3}$ 4) $\mathrm{R}_{4} \mathrm{Si}$
139. Ammonium salt with Nessler's reagent in alkaline media gives brown coloured chemical, the composition of the chemical is 1) $\mathrm{HgO} \cdot \mathrm{Hg}\left(\mathrm{NH}_{3}\right) \mathrm{I}$ 2) $\mathrm{HgO} . \mathrm{Hg}\left(\mathrm{NH}_{2}\right) \mathrm{I}$
3) $\mathrm{HgO}_{2} \mathrm{Hg}\left(\mathrm{NH}_{3}\right)_{2} \mathrm{I}$
4) $\mathrm{HgO} . \mathrm{HgI}_{2}$
140. Conc. $\mathrm{H}_{2} \mathrm{SO}_{4}$ when treated with a Iodised salt violet fumes comes out. This is due to 1) $\mathrm{H}_{2} \mathrm{SO}_{4}$ reduces HI to $\mathrm{I}_{2}$ 2) $\mathrm{H}_{2} \mathrm{SO}_{4}$ oxidises HI to $\mathrm{I}_{2}$ 3) $\mathrm{H}_{2} \mathrm{SO}_{4}$ reduces HI to $\mathrm{HIO}_{3}$ 4) $\mathrm{H}_{2} \mathrm{SO}_{4}$ oxidises HI to $\mathrm{HIO}_{4}$
141. Select the correct match 1) $\mathrm{SO}_{3}$ - turns acidified $\mathrm{K}_{2} \mathrm{Cr}_{2} \mathrm{O}_{7}$ to green
2) $\mathrm{H}_{2} \mathrm{~S}$ - formed during roasting of sulphide mineral 3) $\mathrm{SO}_{2}$ - forms an oxyacid called king of chemicals 4) $\mathrm{Cl}_{2}$ - disproportionates in alkaline media
142. Water transported through lead pipes becomes poisonous due to the formation of
1) $\mathrm{Pb}(\mathrm{OH})_{2}$
2) PbO
43. Which of the following lanthanoid is diamagnetic $[\mathrm{z}$ of $\mathrm{Ce}=$ $58, \mathrm{Sm}=62, \mathrm{Eu}=63 \mathrm{Yb}=70$ ] 1) $\mathrm{Eu}^{2+}$
2) $\mathrm{Yb}^{2+}$
144. Paramagnetic and inner orbital complex is
1) $\left[\mathrm{Ni}(\mathrm{CN})_{5}\right]^{3-}$ 2) $\left[\mathrm{Fe}(\mathrm{CN})_{6}\right]^{4-}$ 3) $\left.\left[\mathrm{Fe}\left(\mathrm{H}_{2} \mathrm{O}\right)_{5} \mathrm{NO}\right]^{2+} 4\right)\left[\mathrm{Fe}(\mathrm{CN})_{6}\right]^{3-}$
145. In the iso electronic metal carbonyls , the CO bond strength is expected to increase in the following order 1) $\left[\mathrm{Mn}(\mathrm{CO})_{6}\right]^{+}<\left(\mathrm{Cr}(\mathrm{CO})_{6}\right)<\left[\mathrm{V}(\mathrm{CO})_{6}\right]$ 2) $\left[\mathrm{V}(\mathrm{CO})_{6}\right]^{-}<\left[\mathrm{Mn}(\mathrm{CO})_{6}\right]<\left[\mathrm{Cr}(\mathrm{CO})_{6}\right]^{+}$ 3) $\left[\mathrm{V}(\mathrm{CO})_{6}\right]^{-}<\left[\mathrm{Mn}(\mathrm{CO})_{6}\right]^{+}<\left[\mathrm{Cr}(\mathrm{CO})_{6}\right]$ 4) $\left[\mathrm{Cr}(\mathrm{CO})_{6}\right]<\left[\mathrm{Mn}(\mathrm{CO})_{6}\right]^{+}<\left[\mathrm{V}(\mathrm{CO})_{6}\right]^{-}$
146. True statements among the following is
a) $\mathrm{PH}_{5}, \mathrm{NCl}_{5}, \mathrm{BiCl}_{5}$ does not exist
b) $\mathrm{XeF}_{4}$ is non polar molecule
c) $\mathrm{I}_{3}^{+}$has bent shape
d) CO and $\mathrm{C}_{2}^{2-}$ has the same bond order
1) a, b,c and d
2) a b and d only
3) b,c and d only
4) a, d only
147. Select the incorrect match 1) $\mathrm{SO}_{4}^{2-}, \mathrm{ClO}_{4}^{-}, \mathrm{PO}_{4}^{3-}=$ Same bond angle 2) $\mathrm{Cl}_{2} \mathrm{O}<\mathrm{ClO}_{2}=$ Bond angle 3) $\mathrm{NO}_{2}^{+}>\mathrm{NO}_{2}^{-}=$Bond angle
4) $\mathrm{CO}_{2}>\mathrm{NO}_{2}^{+}=$Bond angle
148. de Broglie wavelength of an electron accelerated by an electric field of 'v' volts is given by

$$
\begin{array}{ll}
\text { 1) } \lambda=\frac{1.23}{\sqrt{\mathrm{~m}} \cdot v} \mathrm{pm} & \text { 2) } \lambda=\frac{1.23 . \mathrm{m}}{\sqrt{\mathrm{~h}} . v} \\
\text { 3) } \lambda=\frac{1.23}{\sqrt{v}} \mathrm{~nm} & \text { 4) } \lambda=\frac{1.23}{v}
\end{array}
$$

149. The electronic arrangement of an element is $2,8,18,1$ the most stable oxidation state exhibited by the element in aqueous solution is:
1) $\mathrm{M}^{+}$
2) $\mathrm{M}^{2+}$
3) $\mathrm{M}^{3+}$
4) $M^{7+}$
150. Three samples of water A, B and C are labelled as $\mathrm{A}=10^{-3} \mathrm{molal}_{\mathrm{MgSO}}^{4}$; $\mathrm{B}=10^{-3}$ molal $\mathrm{CaSO}_{4} ; \mathrm{C}=10^{-3}$ molal $\mathrm{CaCl}_{2}$. The correct order of degree of hardness of these samples is:
1) $\mathrm{A}>$ B $>$ C
2) A $>$ C $>$ B
3) B $>$ C $>A$
4) $A=B=C$
151. At low pressure Van der waal's equation is reduced to $\left(\mathrm{P}+\frac{\mathrm{a}}{\mathrm{V}^{2}}\right) \mathrm{V}=\mathrm{RT}$ under these conditions, the compressability factor ' $Z$ ' is given by:
1) $1-\frac{a}{R T V}$ 2) $1-\frac{R T V}{a}$
2) $1+\frac{\mathrm{a}}{\mathrm{RTV}} \quad$ 4) $1+\frac{\mathrm{RTV}}{\mathrm{a}}$
152. If the temperature of 1 mole of an ideal gas is increased by $1^{\circ} \mathrm{C}$ at constant pressure, the work done by the gas is equal to:
1) $R$
2) $2 R$
3) $\frac{R}{2}$
4) $\frac{R}{4}$
153. A System contained 10 kg of water at $77^{\circ} \mathrm{C}$. It looses 500 J of heat to the surrounding at $27^{\circ} \mathrm{C}$. Then $\Delta \mathrm{S}$ total for the process is: 1) $-2.83 \mathrm{~J} / \mathrm{K} \quad 2)-2.38 \mathrm{~J} / \mathrm{K}$ 3) $2.38 \mathrm{~J} / \mathrm{K} \quad$ 4) Zero
154. $\Delta \mathrm{H}_{\mathrm{f}}^{\ominus}$ of Graphite is taken as zero. Then $\Delta \mathrm{H}_{\mathrm{f}}^{0}$ of fullerenes is:

| 1) Positive | 2) Negative |
| :--- | :--- |
| 3) Zero | 4) Can not say |

155. For the reactions
$2 \mathrm{CO}_{(\mathrm{g})}+2 \mathrm{H}_{2} \mathrm{O}_{(\mathrm{g})} \rightleftharpoons 2 \mathrm{CO}_{2_{(g)}}$
$+2 \mathrm{H}_{2_{(g)}}, \mathrm{K}_{\mathrm{C}}=\mathrm{K}_{1}$
$\mathrm{CH}_{4(\mathrm{~g})}+\mathrm{H}_{2} \mathrm{O}_{(\mathrm{g})} \rightleftharpoons \mathrm{CO}_{(\mathrm{g})}$
$+3 \mathrm{H}_{2(\mathrm{~g})}, \mathrm{K}_{\mathrm{C}}=\mathrm{K}_{2}$
$\mathrm{CH}_{4(\mathrm{~g})}+2 \mathrm{H}_{2} \mathrm{O}_{(\mathrm{g})} \rightleftharpoons \mathrm{CO}_{2(\mathrm{~g})}$
$+4 \mathrm{H}_{2(\mathrm{~g})}, \mathrm{K}_{\mathrm{C}}=\mathrm{K}_{3}$
Then $\mathrm{K}_{1}, \mathrm{~K}_{2}$ and $\mathrm{K}_{3}$ are related as
1) $\begin{array}{ll}\mathrm{K}_{1}=\frac{\mathrm{K}_{3}}{\mathrm{~K}_{2}} & \text { 2) } \mathrm{K}_{3}=\sqrt{\mathrm{K}_{1}, K_{2}}\end{array}$
2) $K_{3}=K_{1} \times K_{2}$ 4) $K_{1}=K_{2} \times K_{3}$
156. Solubility of AgCl is maximum in:
$\left[\mathrm{K}_{\mathrm{sp}}\right.$ of AgCl in water $\left.=10^{-10} \mathrm{M}^{2}\right]$
1) Water
2) 0.1 M NaCl
3) Liq. $\mathrm{NH}_{3}$
4) $0.01 \mathrm{M} \mathrm{AgNO}_{3}$

## KEY

$\begin{array}{llll}\text { 121) } 2 & \text { 122) } 4 & \text { 123) } 3 & 124) 3\end{array}$
125) 3 126) 3 127) 4 128) 3
129) 3 130) 3 131) 1 132) 3
133) $4 \quad 134) 3$ 135) 1 136) 4
137) 2 138) 2 139) $2 \quad 140) 2$
141) $4 \quad$ 142) $1 \quad$ 143) $2 \quad 144) 4$
$\begin{array}{llll}145) \\ 2 & 146) \\ 1 & 147) 4 & 148) \\ 3\end{array}$
149) 2 150) 4 151) $1 \quad 152$ ) 1
153) 3 154) 1 155) 2 156) 3

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