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## ADMISSION TEST (JEE)

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\begin{aligned}
& \text { SAMPLE PAPER } \\
& \text { Set-1 }
\end{aligned}
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## COURSE: One Year (XI going to XII)

## ADMISSION TEST PATTERN

PHYSICS : 25 MCQs
CHEMISTRY : 25 MCQs
MATHEMATICS : $\mathbf{2 5}$ MCQs

Total Questions: 75
Test Duration: 120 minutes (2 Hours)

## SECTION A : PHYSICS

1. The wavelength $\lambda$ associated with a moving particle is given by $\lambda=m^{p} v^{q} h^{r}$, where $m$ is mass, $v$ is velocity and $h$ is Planck's constant. The correct set of values of $p, q, r$ is -
(A) $p=1, q=1, r=1$
(B) $p=-1, q=-1, r=-1$
(C) $p=-1, q=-1, r=1$
(D) $p=1, q=-1, r=1$
2. A wire is of mass $(0.3 \pm .003) \mathrm{gm}$. The radius is $(0.5 \pm 0.005) \mathrm{cm}$ and length is $(6 \pm .06) \mathrm{cm}$. The maximum percentage error in density is -
(A) 3\%
(B) $4 \%$
(C) $8 \%$
(D) $16 \%$
3. If force, length and time would have been the fundamental units, what would have been the dimensional formula for mass?
(A) $\mathrm{FL}^{-1} \mathrm{~T}^{2}$
(B) $\mathrm{FLT}^{-2}$
(C) $\mathrm{FLT}^{-1}$
(D) F

## Passage (Q. 4 to Q.6)

A particle is dropped from height 20 m above ground. Due to wind it acquires horizontal acceleration $5 \mathrm{~m} / \mathrm{s}^{2}$.
4. The velocity with which particle hits the ground is
(A) $20 \mathrm{~m} / \mathrm{s}$
(B) $10 \sqrt{5} \mathrm{~m} / \mathrm{s}$
(C) $10 \sqrt{3} \mathrm{~m} / \mathrm{s}$
(D) $20 \sqrt{2} \mathrm{~m} / \mathrm{s}$
5. Drift along horizontal direction as particle hits the ground is -
(A) 10 m
(B) 15 m
(C) $10 \sqrt{2} \mathrm{~m}$
(D) 20 m
6. Assuming initial position of particle to be origin, vertically down ward direction on + ve $y$ direction, \& horizontal direction in the direction of wind blow as + ve x-direction equation of trajectory of particle is -
(A) $y=x^{2}$
(B) $y=2 x+x^{2}$
(C) $y=2 x^{2}$
(D) $y=2 x$
7. A golfer standing on level ground hits a ball with a velocity of $u=52 \mathrm{~m} / \mathrm{s}$ at an angle $\alpha$ above the horizontal. If $\tan \alpha=5 / 12$, then the time for which the ball is at least 15 m above the ground (i.e. between $A$ and $B$ ) will be (take $g=10 \mathrm{~m} / \mathrm{s}^{2}$ ) -

(A) 1 sec
(B) 2 secs
(C) 3 secs
(D) 4 secs
8. Two balls are projected from the same point in direction inclined at $60^{\circ}$ and $30^{\circ}$ to the horizontal. If they attain the same maximum height, what is the ratio of their velocities of projection?
(A) $1: \sqrt{3}$
(B) $\sqrt{3}: 1$
(C) $1: 1$
(D) 1: 2
9. From the top of a tower of height $h$ a body of mass $m$ is projected in the horizontal direction with a velocity $v$, it falls on the ground at a distance $x$ from the tower. If a body of mass $2 m$ is projected from the top of another tower of height 2 h in the horizontal direction so that it falls on the ground at a distance $2 x$ from the tower, the horizontal velocity of the second body is -
(A) $2 v$
(B) $\sqrt{2} \mathrm{~V}$
(C) $\frac{\mathrm{V}}{2}$
(D) $\frac{\mathrm{V}}{\sqrt{2}}$
10. A sphere of mass $m$ is held between two smooth inclined walls. For $\sin 37^{\circ}=3 / 5$, the normal reaction of the wall (2) is equal to -

(A) mg
(B) $m g \sin 74^{\circ}$
(C) $m g \cos 74^{\circ}$
(D) None of these
11. Two blocks are connected by a massless string through an ideal pulley as shown. A force of 22 N is applied on block $B$ when initially the blocks are at rest. Then speed of centre of mass of block A and block B, 2 secs, after the application of force is (masses of $A$ and $B$ are 4 kg and 6 kg respectively and surfaces are smooth) -

(A) $1.4 \mathrm{~m} / \mathrm{s}^{2}$
(B) $1 \mathrm{~m} / \mathrm{s}^{2}$
(C) $2 \mathrm{~m} / \mathrm{s}^{2}$
(D) None of these
12. A rod of length $L$ is sliding such that one of its ends is always in contact with a vertical wall and its other end is always in contact with horizontal surface. Just after the rod is released from rest, the magnitude of acceleration of rod at this instant will be -

(A) $\frac{a+b}{\ell}$
(B) $\frac{\sqrt{\left|\mathrm{a}^{2}-\mathrm{b}^{2}\right|}}{\ell}$
(C) $\frac{\sqrt{a^{2}+b^{2}}}{\ell}$
(D) None of these
13. A body of mass $m$ is hauled up the hill with constant speed $v$ by a force such that the force at each point is directed along the tangent to the path. The length of base of hill is Land its height is $h$. The coefficient of friction between the body and path is $\mu$. Then which of the following statement is incorrect when body moves from bottom to top.


L
(A) work done by gravity is -mgh
(B) work done by friction is $-\mu \mathrm{mgL}$
(C) work done by gravity is path independent
(D) None of the above
14. Power applied to a particle varies with time as $P=\left[3 t^{2}-2 t+1\right]$ watts. Where $t$ is time in seconds. Then the change in kinetic energy of particle between time $t=2 s$ to $t=4 \mathrm{~s}$ is -
(A) 46 J
(B) 52 J
(C) 92 J
(D) 104 J
15. A chain of length $\ell<\pi \mathrm{R} / 2$ is placed on a smooth surface whose some part is horizontal and some part is quarter circular of radius R as shown. Initially the whole part of chain lies in the circular part with one end at top most point of circular surface. If the mass of chain is $m$ then the work required to pull very slowly the whole chain on horizontal part is -

(A) $\frac{m}{\ell} g R^{2}\left[\sin \left(\frac{\ell}{R}\right)\right]$
(B) $\frac{\mathrm{m}}{\ell} \mathrm{gR}^{2}\left[\cos \left(\frac{\ell}{\mathrm{R}}\right)\right]$
(C) $\frac{m}{\ell} \operatorname{gR}^{2}\left[\left(\frac{\ell}{\mathrm{R}}\right)-\sin \left(\frac{\ell}{\mathrm{R}}\right)\right]$
(D) None of these
16. One end of a uniform rod of length $/$ and mass $m$ is hinged at $A$. It is released from rest from horizontal position $A B$ as shown in figure. The force exerted by the rod on the hinge when it becomes vertical is -

(A) $\frac{3}{2} \mathrm{mg}$
(B) $\frac{5}{2} \mathrm{mg}$
(C) 3 mg
(D) 5 mg
17. A solid sphere of mass $M$ and radius $R$ is placed on a smooth horizontal surface. It is given a horizontal impulse $J$ at a height $h$ above the centre of mass and sphere starts rolling then, the value of $h$ and speed of centre of mass are -

(A) $\mathrm{h}=\frac{2}{5} \mathrm{R}$ and $\mathrm{v}=\frac{\mathrm{J}}{\mathrm{M}}$
(B) $h=\frac{2}{5} R$ and $v=\frac{2}{5} \frac{J}{M}$
(C) $h=\frac{7}{5} R$ and $v=\frac{7}{5} \frac{J}{M}$
(D) $h=\frac{7}{5} R$ and $v=\frac{J}{M}$
18. A loop of radius 3 meter and weighs 150 kg . It rolls along a horizontal floor so that its centre of mass has a speed of $15 \mathrm{~cm} / \mathrm{sec}$. How much work has to be done to stop it -
(A) 3.375 J
(B) 7.375 J
(C) 5.375 J
(D) 9.375 J
19. The ' $\sigma$ ' of a material is 0.20 . If a longitudinal strain of $4.0 \times 10^{-3}$ is caused, by what percentage will the volume change-
(A) $0.48 \%$
(B) 0.32 \%
(C) $0.24 \%$
(D) $0.50 \%$
20. A cylinder is of length $\ell$ and diameter $d$. On stretching the cylinder, an increment $\Delta \ell$ in length and decrease $\Delta \mathrm{d}$ in diameter are caused. The Poisson ratio is-
(A) $\sigma=-\frac{\Delta \ell}{\ell} \times \frac{\mathrm{d}}{\Delta \mathrm{d}}$
(B) $\sigma=-\frac{\ell}{\mathrm{d}} \times \frac{\Delta \mathrm{d}}{\Delta \ell}$
(C) $\sigma=-\frac{\Delta \ell}{\ell} \times \frac{\Delta d}{d}$
(D) $\sigma=-\frac{\ell}{\Delta \ell} \times \frac{d}{\Delta d}$
21. In a wire stretched by hanging a weight from its end, the elastic potential energy per unit volume in terms of longitudinal strain $\sigma$ and modulus of elasticity Y is -
(A) $\frac{Y \sigma^{2}}{2}$
(B) $\frac{\mathrm{Y} \sigma}{2}$
(C) $\frac{2 Y \sigma^{2}}{2}$
(D) $\frac{\mathrm{Y}^{2} \sigma}{2}$
22. A cylindrical vessel filled with water is released on an inclined surface of angle $\theta$ as shown in figure. The friction coefficient of surface with vessel is $\mu(<\tan \theta)$. Then the constant angle made by the surface of water with the incline will be -

(A) $\tan ^{-1} \mu$
(B) $\theta-\tan ^{-1} \mu$
(C) $\theta+\tan ^{-1} \mu$
(D) $\cot ^{-1} \mu$
23. A U-tube of base length " $\ell$ " filled with same volume of two liquids of densities $\rho$ and $2 \rho$ is moving with an acceleration "a" on the horizontal plane. If the height difference between the two surfaces (open to atmosphere) becomes zero, then the height h is given by -

(A) $\frac{\mathrm{a}}{2 \mathrm{~g}} \ell$
(B) $\frac{3 \mathrm{a}}{2 \mathrm{~g}} \ell$
(C) $\frac{a}{g} \ell$
(D) $\frac{2 \mathrm{a}}{3 \mathrm{~g}} \ell$
24. A vessel contains oil (density $=0.8 \mathrm{gm} / \mathrm{cm}^{3}$ ) over mercury (density $=13.6 \mathrm{gm} / \mathrm{cm}^{3}$ ). A uniform sphere floats with half its volume immersed in mercury and the other half in oil. The density of the material of sphere in $\mathrm{gm} / \mathrm{cm}^{3}$ is -
(A) 3.3
(B) 6.4
(C) 7.2
(D) 12.8
25. A body is projected up with a velocity equal to $\frac{3}{4}$ th of the escape velocity from the surface of the earth. The height it reaches from the centre of the earth is: (Radius of the earth $=\mathrm{R}$ ):
(A) $\frac{10 R}{9}$
(B) $\frac{16 R}{7}$
(C) $\frac{9 R}{8}$
(D) $\frac{10 R}{3}$

## SECTION-B : CHEMISTRY

26. The species, having bond angles of $120^{\circ}$ is :
(A) $\mathrm{PH}_{3}$
(B) $\mathrm{ClF}_{3}$
(C) $\mathrm{NCl}_{3}$
(D) $\mathrm{BCl}_{3}$
27. Which is the least stable resonating structure of the given molecule?

(A)

(B)

(C)

(D)

28. For the following heterogeneous phase equilibrium
$\mathrm{AgCl}(\mathrm{s})+\mathrm{H}_{2} \mathrm{O}(\mathrm{l}) \rightleftharpoons \mathrm{Ag}^{+}(\mathrm{aq})+\mathrm{Cl}^{-}(\mathrm{aq}) ; \Delta_{\mathrm{r}} \mathrm{H}=\mathrm{xkJ} / \mathrm{mol}$
Which of the following change does not affect the solubility of AgCl in water
(A) Increase in temperature
(B) Addition of $\mathrm{AgCl}(\mathrm{s})$ at equilibrium
(C) Addition of $\mathrm{NaCl}(\mathrm{aq})$ at equilibrium
(D) Addition of $\mathrm{AgNO}_{3}(\mathrm{aq})$ at equilibrium
29. Match the interhalogen compounds of Column I with the geometry in column II and Assign the correct code.

## Column I

(a) $\mathrm{XX}^{\prime}$
(b) $\quad \mathrm{XX}_{3}{ }^{\prime}$
(c) $\mathrm{XX}_{5}^{\prime}$
(d) $\mathrm{XX}_{7}^{\prime}$

## Column II

(i) T-shape
(ii) Pentagonal bipyramidal
(iii) Linear
(iv) Square-pyramidal
(v) Tetrahedral

Code :
(a)
(b)
(c)
(d)
(a)
(b)
(c)
(d)
(1)
(iii)
(v)
(iv)
(i)
(ii)
(2)
(iii)
(i)
(iv)
(ii)
(3)
(v)
(iv) (iii)
(ii)
(4)
(iv) (iii)
(ii)
(i)
30. The inductive effects of the groups : $-\mathrm{CH}_{3},-\mathrm{CO}_{2}^{-},-\mathrm{Br},-\mathrm{NH}_{3}^{+}$are respectively
(A) $+\mathrm{I}-\mathrm{I}+\mathrm{I}-\mathrm{I}$
(B) $+\mathrm{I} \quad+\mathrm{I} \quad-\mathrm{I}-\mathrm{I}$
(C) $+\mathrm{I}-\mathrm{I} \quad-\mathrm{I}-\mathrm{I}$
(D) $-\mathrm{I}+\mathrm{I} \quad-\mathrm{I}+\mathrm{I}$
31. The value of $\mathrm{K}_{\mathrm{p}}$ is 50 bar at 400 K and 1700 bar at 500 K for reaction $\mathrm{N}_{2} \mathrm{O}_{4}(\mathrm{~g}) \rightleftharpoons 2 \mathrm{NO}_{2}(\mathrm{~g})$ then incorrect statement is- (Given : $\mathrm{R}=2 \mathrm{Cal} / \mathrm{mol}-\mathrm{K}, \ln 34=3.5$ )
(A) Enthalpy of reaction $(\Delta \mathrm{H})$ is $14 \mathrm{KCal} / \mathrm{mol}$
(B) At 400 K if $\mathrm{N}_{2} \mathrm{O}_{4}$ and $\mathrm{NO}_{2}$ are mixed at 2 bar and 20 bar respectively then more $\mathrm{N}_{2} \mathrm{O}_{4}$ will be formed
(C) On increasing pressure reaction will move in backward direction
(D) At $500 \mathrm{~K}, \mathrm{~K}_{\mathrm{C}}>\mathrm{K}_{\mathrm{P}}$
32. Which of the following pairs of compounds is isoelectronic and isostructural?
(A) $\mathrm{BeCl}_{2}, \mathrm{XeF}_{2}$
(B) $\mathrm{TeI}_{2}, \mathrm{XeF}_{2}$
(C) $\mathrm{IBr}_{2}^{-}, \mathrm{XeF}_{2}$
(D) $\mathrm{IF}_{3}, \mathrm{XeF}_{2}$
33. Non valid resonating structure of $\mathrm{N}, \mathrm{N}$-dimethyl aniline is -
(A)

(B)

(C)

(D)

34. Variation of vapour pressure of different liquids with temperature is depicted below :


Then select the correct option-
(A) Liquid A and B boils at approximately 273 K and 293 K respectively
(B) Liquid A is more volatile than C
(C) At 298 K temperature, vapour pressure of liquid C will be maximum
(D) At high altitude, if atmospheric pressure decreases to 400 mm then both $\mathrm{A}(l)$ and $\mathrm{B}(l)$ boils at 293 K.
35. Which one of the following pairs of species have the same bond order?
(A) CO, NO
(B) $\mathrm{O}_{2}, \mathrm{NO}^{+}$
(C) $\mathrm{CN}^{-}, \mathrm{CO}$
(D) $\mathrm{N}_{2}, \mathrm{O}_{2}$
36. Which of the following is a +I group?
(A)

(B)

(C)

(D)

37. For 1 mole of different real gases, curves of $\mathrm{Z} v / \mathrm{s} \mathrm{P}$ is plotted at constant temperature. With the help of curves given below, select the correct order of liquefiability of gases -

(A) $\mathrm{H}_{2}<\mathrm{O}_{2}<\mathrm{CH}_{4}<\mathrm{CO}_{2}$
(B) $\mathrm{CO}_{2}<\mathrm{CH}_{4}<\mathrm{O}_{2}<\mathrm{H}_{2}$
(C) $\mathrm{O}_{2}<\mathrm{CH}_{4}<\mathrm{CO}_{2}<\mathrm{H}_{2}$
(D) $\mathrm{H}_{2}<\mathrm{CH}_{4}<\mathrm{O}_{2}<\mathrm{CO}_{2}$
38. Four diatomic species are listed below in different sequence. Which of these represents the correct order of their increasing bond order?
(A) $\mathrm{C}_{2}{ }^{2-}<\mathrm{He}_{2}^{+}<\mathrm{NO}<\mathrm{O}_{2}^{-}$
(B) $\mathrm{He}_{2}{ }^{+}<\mathrm{O}_{2}^{-}<\mathrm{NO}<\mathrm{C}_{2}{ }^{2-}$
(C) $\mathrm{O}_{2}^{-}<\mathrm{NO}<\mathrm{C}_{2}{ }^{2-}<\mathrm{He}_{2}{ }^{+}$
(D) $\mathrm{NO}<\mathrm{C}_{2}{ }^{2-}<\mathrm{O}_{2}{ }^{-}<\mathrm{He}_{2}{ }^{+}$
39. Number of $\mathrm{sp}^{2}$ hybrid atoms in the following compound is / are?

(A) 12
(B) 14
(C) 15
(D) 11
40. De Broglie wavelength of a moving electron in excited state of H atom is thrice of an electron revolving in 4th orbit of $\mathrm{Li}^{+2}$ ion, if that electron return to ground state, then maximum number of possible spectral lines that can be observed are - [If sample has only 1 H -atom]
(A) 1
(B) 2
(C) 3
(D) 4
41. Which of the following fluoro-compounds is most likely to behave as a Lewis base ?
(A) $\mathrm{SiF}_{4}$
(B) $\mathrm{BF}_{3}$
(C) $\mathrm{PF}_{3}$
(D) $\mathrm{CF}_{4}$
42. Which of the following is least stable carbocation?
(A)

(B)

(C)

(D)

43. Ratio of largest wavelength of Balmer series with smallest wavelength of Brackett series in hydrogen spectrum is-
(A) $9: 100$
(B) $20: 9$
(C) $9: 20$
(D) $100: 9$
44. Which one of the following orders is correct for the bond dissociation enthalpy of halogen molecules?
(A) $\mathrm{F}_{2}>\mathrm{Cl}_{2}>\mathrm{Br}_{2}>\mathrm{I}_{2}$
(B) $\mathrm{I}_{2}>\mathrm{Br}_{2}>\mathrm{Cl}_{2}>\mathrm{F}_{2}$
(C) $\mathrm{Cl}_{2}>\mathrm{Br}_{2}>\mathrm{F}_{2}>\mathrm{I}_{2}$
(D) $\mathrm{Br}_{2}>\mathrm{I}_{2}>\mathrm{F}_{2}>\mathrm{Cl}_{2}$
45. Give the correct order of acidic strength of mentioned groups.

(A) a $>$ b $>c>d$
(B) b $>$ c $>$ a $>$ d
(C) $\mathrm{c}>\mathrm{b}>\mathrm{a}>\mathrm{d}$
(D) b $>$ a $>$ c $>$ d
46. Number of electrons in Cu atom having $(\mathrm{n}+l+\mathrm{m})=4$ is -
(A) 1
(B) 3
(C) 5
(D) 7
47. Consider the molecules $\mathrm{CH}_{4}, \mathrm{NH}_{3}$ and $\mathrm{H}_{2} \mathrm{O}$. Which of the given statement is false ?
(A) The $\mathrm{H}-\mathrm{C}-\mathrm{H}$ bond angle is $\mathrm{CH}_{4}$ is larger than the $\mathrm{H}-\mathrm{N}-\mathrm{H}$ bond angle is $\mathrm{NH}_{3}$
(B) The $\mathrm{H}-\mathrm{C}-\mathrm{H}$ bond angle is $\mathrm{CH}_{4}$, the $\mathrm{H}-\mathrm{N}-\mathrm{H}$ bond angle in $\mathrm{NH}_{3}$ and the $\mathrm{H}-\mathrm{O}-\mathrm{H}$ bond angle in $\mathrm{H}_{2} \mathrm{O}$ are all greater than $90^{\circ}$.
(C) The $\mathrm{H}-\mathrm{O}-\mathrm{H}$ bond angle in $\mathrm{H}_{2} \mathrm{O}$ is larger than the $\mathrm{H}-\mathrm{C}-\mathrm{H}$ bond angle in $\mathrm{CH}_{4}$
(D) The $\mathrm{H}-\mathrm{O}-\mathrm{H}$ bond angle in $\mathrm{H}_{2} \mathrm{O}$ is smaller than the $\mathrm{H}-\mathrm{N}-\mathrm{H}$ bond angle in $\mathrm{NH}_{3}$
48. Which base is weakest?
(A) $\mathrm{H}_{2} \mathrm{~N}-\mathrm{CH}_{2}-\mathrm{CH}_{3}$
(B) $\mathrm{HN}=\mathrm{CH}-\mathrm{CH}_{3}$
(C) $\mathrm{H}_{3} \mathrm{C}-\mathrm{CH}_{2}-\mathrm{NH}-\mathrm{CH}_{2}-\mathrm{CH}_{3}$
(D) $\mathrm{H}_{3} \mathrm{C}-\mathrm{C} \equiv \mathrm{N}$ :
49. $\quad$ For $\mathrm{H}_{2}(\mathrm{~g})$ and $\mathrm{He}(\mathrm{g})$, at moderate temperature, Vander Waal equation can be represented as -
(A) $\left(\mathrm{P}+\frac{\mathrm{a}}{\mathrm{V}_{\mathrm{m}}{ }^{2}}\right)\left(\mathrm{V}_{\mathrm{m}}\right)=\mathrm{RT}$
(B) $\mathrm{PV}_{\mathrm{m}}-\mathrm{Pb}=\mathrm{RT}$
(C) $\mathrm{PV}_{\mathrm{m}}=\mathrm{RT}$
(D) $\mathrm{PV}_{\mathrm{m}}=\mathrm{RT}-\mathrm{Pb}$
50. Which of the following are peroxoacids of sulphur?
(A) $\mathrm{H}_{2} \mathrm{SO}_{5}$ and $\mathrm{H}_{2} \mathrm{~S}_{2} \mathrm{O}_{8}$
(B) $\mathrm{H}_{2} \mathrm{SO}_{5}$ and $\mathrm{H}_{2} \mathrm{~S}_{2} \mathrm{O}_{7}$
(C) $\mathrm{H}_{2} \mathrm{~S}_{2} \mathrm{O}_{7}$ and $\mathrm{H}_{2} \mathrm{~S}_{2} \mathrm{O}_{8}$
(D) $\mathrm{H}_{2} \mathrm{~S}_{2} \mathrm{O}_{6}$ and $\mathrm{H}_{2} \mathrm{~S}_{2} \mathrm{O}_{7}$

## SECTION-C : MATHEMATICS

51. If all the six letters words (with or without meaning) formed using the letters of the word 'FLOWER' and arranged as in dictionary, then the rank of the word 'FLOWER' is
(A) 153
(B) 154
(C) 155
(D) 156
52. The locus of the middle point of the chord of the circle $x^{2}+y^{2}-12 x+4 y+4=0$, that subtends an angle $\frac{2 \pi}{3}$ at the centre is
(A) $x^{2}+y^{2}-12 x+4 y+30=0$
(B) $x^{2}+y^{2}-12 x+4 y+31=0$
(C) $x^{2}+y^{2}+12 x+4 y+31=0$
(D) $x^{2}+y^{2}+12 x+4 y+30=0$
53. If point $(0$, a) lies inside the triangle formed by the lines $y+3 x+2=0,3 y-2 x-5=0$ and $4 y+x-14=0$, then the number of possible integral values of $a$ is
(A) 4
(B) 3
(C) 2
(D) 1
54. If the area of a triangle is 96 , and the radii of the escribed circles are 8,12 and 24 , then the perimeter of the triangle is equal to
(A) 24
(B) 48
(C) 36
(D) 18
55. Sum of all integral values in the range of the rational expression $\mathrm{y}=\frac{\mathrm{x}^{2}-\mathrm{x}-1}{\mathrm{x}^{2}+\mathrm{x}+1}, \forall \mathrm{x} \in \mathrm{R}$ is equal to
(A) -2
(B) -1
(C) 0
(D) 2
56. The value of $\sum_{n=1}^{\infty} \frac{(3 n+4)}{n(4 n+4) \cdot 4^{n}}$ is equal to
(A) $\frac{1}{5}$
(B) $\frac{1}{4}$
(C) $\frac{1}{25}$
(D) $\frac{1}{16}$
57. If $\log x-\log y=3$ and $(x-y)=666$, then $(x+y)$ is equal to (base of logarithm is 10)
(A) $\frac{2002}{3}$
(B) $\frac{1998}{3}$
(C) $\frac{2000}{3}$
(D) $\frac{1000}{999}$
58. If $\alpha, \beta$ are the roots of the equation $8 x^{2}-3 x+27=0$, then the value of $\left(\frac{\alpha^{2}}{\beta}\right)^{\frac{1}{3}}+\left(\frac{\beta^{2}}{\alpha}\right)^{\frac{1}{3}}$ is
(A) $\frac{1}{3}$
(B) $\frac{1}{4}$
(C) $\frac{1}{5}$
(D) $\frac{1}{6}$
59. The number of integral values of $\lambda$ for which $x^{2}+y^{2}+2 \lambda x+2(1-\lambda) y+9=0$ is the equation of a circle whose radius equal to 4 , is
(A) 1
(B) 2
(C) 3
(D) 4
60. In a $\triangle A B C$, if $\left|\begin{array}{lll}1 & \text { a } & \text { b } \\ 1 & \text { c } & \text { a } \\ 1 & \text { b } & \text { c }\end{array}\right|=0$, then value of $\tan ^{2}\left(\frac{A}{2}\right)+\tan ^{2}\left(\frac{B}{2}\right)+\tan ^{2}\left(\frac{C}{2}\right)$ is equal to
[Note: All symbols used have usual meaning in $\triangle \mathrm{ABC}$.]
(A) -1
(B) 0
(C) 1
(D) $\frac{1}{3}$
61. Sum of all integral values of a for which one root of equation $(a-5) x^{2}-2 a x+a-4=0$ is smaller than 1 and the other greater than 2 , must be equal to
(A) 255
(B) 260
(C) 261
(D) 263
62. If $x+y+z=9$ where $x, y, z>0$, then the maximum value of $x y z$ is
(A) 3
(B) 9
(C) 27
(D) 81
63. The number of ways the letters of the word. 'COMBINATION' be permuted so that no two vowels come together is
(A) $\frac{7!\cdot 6!}{(2!)^{3}}$
(B) $\frac{7!\cdot 6!}{(2!)^{4}}$
(C) $\frac{7!\cdot 6!\cdot 5!}{(2!)^{3}}$
(D) $\frac{7!\cdot 6!\cdot 5!}{(2!)^{4}}$
64. The equation of the circle described on the common chord of the circle $x^{2}+y^{2}+2 x=0$ and $x^{2}+y^{2}+2 y=0$ as diameter is
(1) $x^{2}+y^{2}+x-y=0$
(2) $x^{2}+y^{2}-x+y=0$
(3) $x^{2}+y^{2}-x-y=0$
(4) $x^{2}+y^{2}+x+y=0$
65. The number of solution(s) of the equation $\left(2 \sin \frac{x}{2}-1\right)(\cos x+2)=0$ in $[0, \pi]$ is
(A) 4
(B) 3
(C) 2
(D) 1
66. If $\mathrm{a}_{1}, \mathrm{a}_{2}, \mathrm{a}_{3} \ldots \ldots . . .$. are in A.P. and $a_{1}+a_{4}+a_{7}+a_{10}+a_{13}+a_{16}=375$, then value of $\sum_{i=1}^{16} a_{i}$ is equal to
(A) 800
(B) 1000
(C) 1100
(D) 1200
67. Rajdhani express bound from Kota to Bombay stops at 10 intermediate stations. 5 passengers enter the train during the journey holding 5 different tickets of the AC class or sleeper class. How many different set of tickets they may have had.
(A) ${ }^{55} \mathrm{C}_{5}$
(B) ${ }^{110} \mathrm{C}_{5}$
(C) ${ }^{45} \mathrm{C}_{5}$
(D) ${ }^{90} \mathrm{C}_{5}$
68. If the three equations $x^{2}+p x+12=0, x^{2}+q x+15=0$ and $x^{2}+(p+q) x+36=0$ have a common positive root and $\alpha, \beta, \gamma$ be respectively their other roots, then $\alpha+\beta+\gamma$ is equal to
(A) 20
(B) 21
(C) 24
(D) 25
69. If $\cot \left(\frac{\pi}{3} \cos 2 \pi x\right)=\sqrt{3}$, then the general solution of the equation is
(A) $\mathrm{x}=\mathrm{n} \pm \frac{1}{2},(\mathrm{n} \in \mathrm{I})$
(B) $\mathrm{x}=\mathrm{n} \pm \frac{1}{3},(\mathrm{n} \in \mathrm{I})$
(C) $\mathrm{x}=\mathrm{n} \pm \frac{1}{6},(\mathrm{n} \in \mathrm{I})$
(D) $\mathrm{x}=\mathrm{n} \pm \frac{1}{4},(\mathrm{n} \in \mathrm{I})$
70. There are 20 persons including two brothers. In how many ways can they be seated on a round table if two brothers are never sit together is
(A) 17 (17!)
(B) 18 (18!)
(C) 17 (18!)
(D) 18 (17!)
71. Combined equation of line joining the origin to the points of intersection of $2 x^{2}+3 x y-4 x+1=0$ and $3 x+y=1$ is given by
(A) $x^{2}+y^{2}-5 x y=0$
(B) $x^{2}-y^{2}+5 x y=0$
(C) $x^{2}-y^{2}-5 x y=0$
(D) $x^{2}+y^{2}+5 x y=0$
72. If sides of a triangle are $3,4 \& 6$ units, then triangle is
(A) acute angled
(B) right angled
(C) obtuse angled
(D) none
73. The digits of the number 122311 are arranged in all possible ways. The number of all different numbers greater than 300000 are
(A) 10
(B) 12
(C) 32
(D) 120
74. The radical centre of three circles described on the three sides $4 x-7 y+10=0, x+y-5=0$ and $7 x+4 y-15=0$ of a triangle as diameters is
(A) $(2,1)$
(B) $(1,2)$
(C) $(2,3)$
(D) $(-6,-2)$
75. If maximum and minimum values of $1+\sin \left(\frac{\pi}{4}+\theta\right)+2 \cos \left(\frac{\pi}{4}-\theta\right)$ where $\theta \in R$, are $M$ and $m$ respectively then $(M+m)$ is equal to
(A) -2
(B) 0
(C) 2
(D) 4

## ADMISSION TEST (JEE) | SAMPLE PAPER Set-1 <br> COURSE : XII One Year (XI going to XII)

## ANSWER KEY

1. (C)
2. (B)
3. (D)
4. (D)
5. (C)
6. (B)
7. (A)
8. (C)
9. (C)
10. (C)
11. (A)
12. (A)
13. (D)
14. (D)
15. (B)
16. (B)
17. (B)
18. (B)
19. (B)
20. (D)
21. (A)
22. (A)
23. (C)
24. (A)
25. (D)
26. (B)
27. (A)
28. (D)
29. (C)
30. (B)
31. (B)
32. (B)
33. (A)
34. (B)
35. (B)
36. (A)
37. (C)
38. (B)
39. (C)
40. (B)
41. (B)
42. (B)
43. (A)
44. (B)
45. (C)
46. (A)
47. (B)
48. (C)
49. (C)
50. (C)
51. (A)
52. (D)
53. (C)
54. (B)
55. (C)
56. (C)
57. (C)
58. (D)
59. (A)
60. (C)
61. (B)
62. (B)
63. (C)
64. (B)
65. (A)
66. (A)
67. (B)
68. (C)
69. (B)
70. (B)
71. (C)
72. (B)
73. (C)
74. (C)
75. (C)
