Sri Chaitanya Educational Institutions | Infinity Learn

39 Years of Excellence 1986-2024

2024 JEE 27th Shift-2 Questions

HISTORY CREATED

39 YEARS OF ACADEMIC EXCELLENCE

ASIS'S GREATEST EDUCATION BRAND IN IIT-JEE, NEET & OLYMPIADS

THE PERFECT HAT-TRICK WITH ALL-INDIA RANK 1

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27-Jan-2024 Shift-2

Chemistry

1. Identify from the following species in which d^2sp^3 hybridization is shown by central atom
   a) SF_6
   b) BrF_5
   c) $[Pt\,(Cl_4)]^{-2}$
   d) $[\mathrm{CO(NH_3)_6}]^{+3}$
   Ans: d

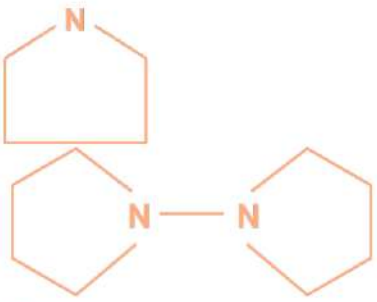
2. Which type of protein can not be denaturized when heated
   a) Primary
   b) Secondary
   c) Tertiary
   d) Quaternary
   Ans: d

3. Phenolic group can be identified by a positive:
   (a) Phthalein dye test,
   (b) Carbylamine test,
   (c)Lucas test
   (d) Tollen's test.
   Ans: a

4. Incorrect pair form
   a) Habber process – Iron
   b) Polythene – $\frac{\mathrm{Ticl_4}}{\mathrm{Al(CH_3)_3}}$
   c) Photography - AgBr
   d) Wacker process - $\mathrm{PtCl_2}$
   Ans: d

5. $\mathrm{Cl-(CH_2)_4-Cl} \xrightarrow{\text{excess } \mathrm{NH_3}} \xrightarrow{\mathrm{NaOH}} \mathrm{A + H_2O + Nacl}$
   a) $\mathrm{Cl^- + NH_3-(CH_2)_4-NH^+Cl^-}$
   b) $\mathrm{NH_2-(CH_2)_4-NH_2}$

c)



d)

Ans: c

6. The quantity which changes with temperature:
   a) Mole fraction
   b) Mass Percentage
   c) Molarity
   d) Molality

   Ans: c

7. Which of the following can not act as an oxidizing agent?
   (a) MnO_4^-
   (b) SO_4^{2-}
   (c) N^{3-}
   (d) BrO_3^-

   Ans: c

8. Phenolic group can be identified by a positive
   a) Lucas test
   b) Carbylamine test
   c) Phthalein test
   d) Tollen's test

   Ans: c

9. Products for the below reaction are:

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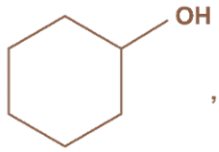
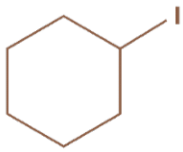
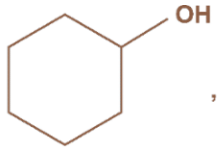
a)  , $(CH_3)_3$ C-I

b)  , $(CH_3)_3$ C-OH

c)  , $(CH_3)_3$ C-OH

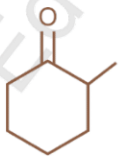
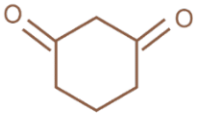
d) , $(CH_3)_3$ C-I

Ans: a

10. $Ph - CH_2 = CH_2 \xrightarrow{BH_3, H_2O_2}$

Ans: -

11. No. of non-polar compounds $H_2O,\ CO_2,\ NH_3,\ BF_3,\ CH_4,\ SO_2,\ HF,\ HCl$
Ans: 3

12. No. of compounds with chiral centres  

$CH_3 - CH_2 - \underset{|}{\overset{NO_2}{CH}} - CH_3,\ CH_3 - \underset{|}{\overset{OH}{CH}} - CH_2 - OH,\ CH_3 - \underset{|}{\overset{I}{CH}} - CH_2 - CH_2I$

Ans: 4

13. Which of the options, all the elements have d^{10} configuration in their ground state
    a) $Cu,\ Zn,\ Cd,\ Ag$
    b) $Cd,\ Au,\ Hg,\ Ni$
    c) $Sc,\ Ti,\ Fe,\ Zn$
    d) $Fe,\ Cr,\ Co,\ Ni$
    Ans: a

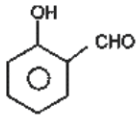
14. Steam volatile & water immiscible compounds can be separated by
    a) Distillation
    b) Fractional distillation

c) Distillation under reduced pressure
d) Steam distillation
Ans: d

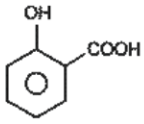
15. For a first order reaction $t_{99.9\%} = x\, t_{50\%}$. Find out the value of x
Ans: 10

16. Which of the following will not give S_N1
a) $CH_2 = CH - CH_2 - Cl$
b) $Ph - CH_2 - Cl$
c) $CH_3 - CH = CH - Cl$
d) $(H_3C)_3C - Cl$
Ans: c

17. Match the following

A) 

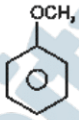
a) $NaOH, CO_2, H^+$

B) 

b) $Na_2Cr_2O_7/H_2O$

C)

c) $NaOH/CH_3 - Cl$

D) 

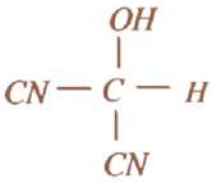
d) $NaOH/CHCl_3$

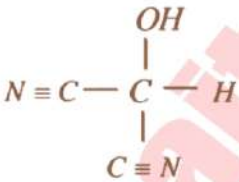
Ans: A – d, B – a, C – b, D - d

18. Which represents the line formula of $(OH)CH\ (CN)_2$

A.

B.

C. 

D. 

Ans: a

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27-Jan-2024 Shift-2

Maths

1. 20^{th} term from the end of $20, 19\frac{1}{4}, 18\frac{1}{2}, 17\frac{3}{4}, \ldots\ldots, -129\frac{1}{4}$

   Ans: (-115)

2. The position vector of vertices A, B, C of Δ are $\hat{i}+2\hat{j}+3\hat{k}, \hat{i}+\hat{j}+3\hat{k}, 2\hat{i}+\hat{j}+3\hat{k}$ respectively. Let l is the length of angle bisector of $\angle BAC$, then the value of l^2 is:

   (a) $4+2\sqrt{2}$

   (b) $4-2\sqrt{2}$

   (C) $2+2\sqrt{2}$

   (d) $2-2\sqrt{2}$

   Ans: (b)

3. If A is a 2×2 matrix and I is an Identity matrix of order 2 $\&|A-\lambda I|=0$ gives values of λ as $-1\&3$. Then, trace of A^2 is equal to

   Ans: (10)

4. If $\frac{dy}{dx}=\frac{x+y-2}{x-y}$, and $y(0)=2$, find $y(2)$.

   (a) 0

   (b) 2

   (c) e

   (d) e^2

   Ans: (a)

5. The area bounded by $0\le y\le \min\{2x, 6x-x^2\}$ and x-axis is A. then 12 A is:

   Ans: (304 sq. Units)

6. $0<a<1, \int_0^{\pi}\frac{dx}{1-2a\cos x+a^2}=$ value of the integral

   (a) $\frac{\pi^2}{\pi+a^2}$

   (b) $\frac{\pi}{1+a^2}$

   (c) $\frac{\pi^2}{\pi-a^2}$

   (d) $\frac{\pi}{1-a^2}$

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Ans: (d)

7. The integral $\int \frac{(x^8-x^2)}{(x^{12}+3x^6+1)\tan^{-1}\left(x^3+\frac{1}{x^3}\right)}dx$ is equal to:

(a) $\frac{1}{3}\ln\left|\left(\tan^{-1}\left(x^3+\frac{1}{x^3}\right)\right)\right|+C$

(b) $\ln\left|\left(\tan^{-1}\left(x^3+\frac{1}{x^3}\right)\right)\right|+C$

(C) $\frac{1}{6}\ln\left|\left(\tan^{-1}\left(x^3+\frac{1}{x^3}\right)\right)\right|+C$

(d) $\frac{1}{9}\ln\left|\left(\tan^{-1}\left(x^3+\frac{1}{x^3}\right)\right)\right|+C$

Ans: (a)

8. If $2\tan^2\theta-5\sec\theta=1$ has exactly 7 solutions in $\left[0,\frac{n\pi}{2}\right]$ for least value of $n\in N$, then $\sum_{k=1}^{n}\frac{k}{2^n}$ is equal to

(a) $\frac{9}{2^9}$

(b) $\frac{91}{2^{13}}$

(C) $\frac{7}{2^7}$

(d) $\frac{11}{2^{12}}$

Ans: (b)

9. Let R be the interior region between the lines $3x-y+1=0$ and $x+2y-5=0$ containing the origin. The set of all values of a for which the points $(a^2,a+1)$ lies in R is

(a) $(-\infty,-1)\cup(3,\infty)$

(b) $(-3,0)\cup\left(\frac{1}{3},1\right)$

(C) $(-\infty,-1)\cup\left(0,\frac{1}{3}\right)$

(d) $(-\infty,-2)\cup\left(0,\frac{1}{3}\right)$

Ans: (b)

10. If $f(x)=6x-x^2, x\in[0,2]$ and $g(x)=\begin{cases}\min f(t), 0\le t\le x\\ 3+x, x\in[1,2]\end{cases}$ then number of points where $g(x)$ is not differentiable is:

(a) 1

(b) 0

(c) 2

(d) 3

Ans: (a)

11. If for two sets $A\&B, n(A) = m$ and $n(B) = n$. Also, (Number of subsets of A − Number of subsets of B) $= 56$. Then find the value of $(2m + n)$

Ans: (15)

12. If the line $x + y = 0$ is tangent to the circle $(x - \lambda)^2 + (y - \beta)^2 = 50$, then $(\lambda + \beta)^2 =$

Ans: (100)

13. If $f(x) = \int_0^x g(t)\ln\left(\frac{1-t}{1+t}\right)dt$ and g is odd continuous function and $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}}\left(f(x) + \frac{x^2\cos x}{(1+e^x)}\right)dx = \frac{\pi^2}{\alpha^2} - \alpha$, then α is

Ans: (-2)

14. If α and β are the roots of the equation $x^2 - x - 1 = 0$ and $S_n = 2024 \cdot \alpha^n + 2024 \cdot \beta^n$. Then S_3 is equal to

(a) 8096
(b) 4048
(C) 1024
(d) 2024

Ans: (a)

15. If the mean of 15 observations is 12 and standard deviation is 3 . If 12 is replaced by 10 in data, then the new mean is μ and variance is σ^2, then what is the value of $15(\mu + \mu^2 + \sigma^2) =$

Ans: (2429)

16. If $\lim_{x\to 0}\frac{3+\alpha\sin x+\beta\cos x+\ln(1-x)}{3\tan^2 x} = \frac{1}{3}$, then $2\alpha - \beta$ is equal to

Ans: (5)

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27-Jan-2024 Shift-2

Physics

1. The threshold frequency of metel with work function 6.63ev is
   Ans: $1.6 \times 10^{15}\ Hz$

2. Does kinetic friction and static friction depend on area of contact and material of surface.
   a) only on surface area
   b) only on material
   c) both material on surface
   d) None of these
   Ans: b

3. Total kinetic energy of $1\ \text{mol}$ of oxygen at 27°C
   Ans: 6250 J

4. Current of $200\ \text{A}$ deflects the coil of a moving coil galvanometer by 60°. Find the current to cause deflection of $\frac{\pi}{10}\text{rad}$
   Ans: 60 A

5. During an adiabatiic process the pressure of gas is proportional to cube of its absolute temperature the ratio of C_p/C_v is
   Ans: $\frac{3}{2} = 1.5$

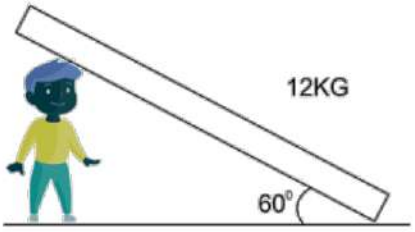
6. A bullet is fired into a wooden plank , its velocity becomes 1/3 when it penetrates by 4 cm how much further it should penetrate for its velocity to become zero
   Ans: 0.5 cm

7. A body is allowed to free fall from height h .Distance between two points A & B in the motion is 80m and time taken to travel from A to B is 2sec . Find the distance of point A from the initial point of projection
   Ans: 45 m

8. A body is projected up with a velocity to $3^{\text{th}}/4$ of the escape velocity from The surface of the earth. The height it reaches from the centre of the earth is

Ans: $\frac{9R}{7}$

9. Find the normal contact force between man and rod



Ans: 30 N

10. In a Wheatstone bridge of resistance X with specific resistance $= \frac{x\pi r2}{L} = Sr$ when the length is doubled What is the new specific resistance
(a) $S_1/2$
(b) $2\ S_1$
(c) $4\ S_1$
(d) S_1
Ans: d

11. Assertion: for equipotential surface work done by the field is 0
Reason: electric lines of force is perpendicular to the surface
Ans: A – T & R - T

12. Longest wavelength for paschen series is given by $\lambda = \frac{\alpha}{7R_H}$. Then value of α is
Ans: $\alpha = 144$

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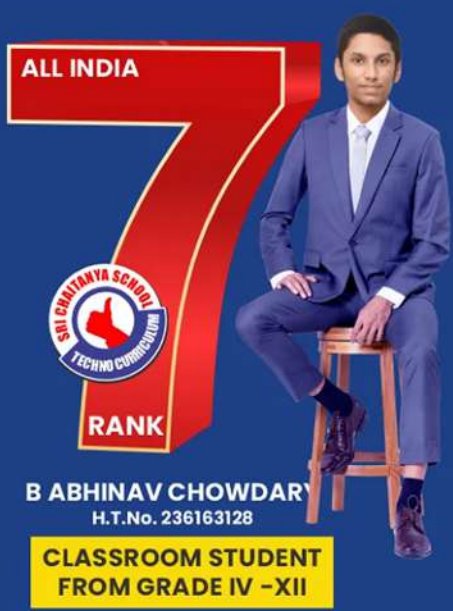

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