MATHS

BOOKS - SAI MATHS (TELUGU ENGLISH)

EAMCET - 2018 (TS) SHIFT - 2

Mathematics

1. The set of all value of x and the set of all values of a for which the real valued function $f(x) = \sqrt{\log_a(x - [x])}$ is defined are respectively.

A. $R - Z \& (0, 1)$

B. $Z \& R - \{0, 1\}$

C. $Z \& (1, \infty)$

D. $R \& R$

Answer: A

View Text Solution

2. A function $f: R - \{0\} \to R$ is defined as

$$f(x) = \begin{cases} x^2 + 3x - 7, & x > 0 \\ h(x), & x < 0 \end{cases}$$

If f is an odd function then $h(x) =$

A. $x^2 + 3x + 7$

B. $x^2 + 3x - 7$

C. $-x^2 + 3x + 7$

D. $-x^2 - 3x + 7$

Answer: D

View Text Solution

3. $x^n + y^n$ is divisible by

A. $x - y$ for all $n \in N$

B. $x + y$ for all $n \in N$

C. $x + y$ for all $n = 2m - 1, m \in N$

D. $x + y$ for all $n = 2m, m \in N$

Answer: C

View Text Solution

4. Let A be the set of all 3×3 determinants with entries 0 or 1 only and B the subset of A consisting of all determinants with value 1. If C is the subset of A consisting of all determinants with value - 1, then

A. $n(C) = 0$

B. $n(B) = n(C)$

C. $A = B \cup C$

D. $n(B) - 2n(A)$

Answer: B

View Text Solution

5. $\begin{vmatrix} 1bc+ad & b^2c^2+a^2d^2 \\ 1ca+bd & c^2a^2+b^2d^2 \\ 1ab+cd & a^2b^2+c^2d^2 \end{vmatrix} =$

A. $(a-b)(b-c)(c-d)(a-d)(a-c)(d-b)$

B. $(a-b)(a-c)(b-c)(b-d)(a-d)(c-d)$

C. $(a-b)(a-c)(a-d)(b-c)(b-d)(d-c)$

D. $(a-b)(b-c)(c-d)(b-d)$

Answer: B

View Text Solution

6. The set of real values of α for which the system of linear equations:

$(x)+(\sin\alpha)y+(\cos\alpha)z=0$

$(x)+(\cos\alpha)y+(\sin\alpha)z=0$

$(-x)+(\sin\alpha)y-(\cos\alpha)z=0$

has a non- trivia solution is

A. $\frac{n\pi}{2}+(-1)^n\frac{\pi}{4}+\frac{\pi}{8}$ (n is an integer)

B. $\frac{n\pi}{2}+(-1)^n\frac{\pi}{8}$ (n is an integer)

C. $\frac{n\pi}{2}+(-1)^n\frac{\pi}{8}-\frac{\pi}{8}$ (n is an integer)

D. $\frac{n\pi}{2}+(-1)^n\frac{\pi}{8}-\frac{\pi}{8}$ (n is an integer)

Answer: C

View Text Solution

7. If $\frac{1-10i\cos\theta}{1-10\sqrt{3}i\sin\theta}$ is purely real, then one of the values of θ is

A. $\frac{\pi}{6}$

B. $\frac{\pi}{4}$

C. $\frac{\pi}{3}$

D. $\frac{\pi}{2}$

Answer: A

View Text Solution

8. If z and w are comple numbers such that $\bar{z} - \bar{i}\bar{w} = 0$ and $\text{Arg}(zw) = \frac{3\pi}{4}$, Then Arg z =

A. $\frac{\pi}{16}$

B. $\frac{\pi}{8}$

C. $\frac{\pi}{4}$

D. $\frac{3\pi}{4}$

Answer: B

View Text Solution

9. The number of complex roots of the equation $x^{11} - x^7 + x^4 - 1 = 0$ whose arguments lie in the first quadrants is

A. 2

B. 3

C. 7

D. 9

Answer: B

View Text Solution

10. If α is a root of $z^2 - z + 1 = 0$ then

$$\left(\alpha^{2014} + \frac{1}{\alpha^{2014}}\right) + \left(\alpha^{2015}\frac{1}{\alpha^{2015}}\right)^2 + \left(\alpha^{2016} + \frac{1}{\alpha^{2016}}\right)^3 + \left(\alpha^{2017} + \frac{1}{\alpha^{201}}\right.$$

A. 8

B. 5

C. 3

D. -5

Answer: A

View Text Solution

11. Let $E_1 \equiv ax^2 + bx + ce$, $E_2 \equiv bx^2 + cx + a$, $E_3 \equiv cx^2 + bx + a$ and $\frac{a^2}{bc} + \frac{b}{c}$. If these quadratic expressions have a common zero, then the quadratic expression having zeroes that are common to E_2 and E_3 and different from the zeroes of E_1 is

A. $x^2 - \frac{a(b+c)}{bc}x + bc$

B. $ax^2 + bx + c$

C. $x^2 - b(c+a)x + ac$

D. $x^3 - \frac{a(b+c)}{bc}x + \frac{a^2}{bc}$

Answer: D

View Text Solution

12. If for real x, $\frac{11x^2+12x+6}{x^2+4x+2}=y$ is such that $y<a$ or $y>b$ then a , b are

A. $3, 5$

B. $-5, 3$

C. $-4, 5$

D. $-6, 4$

Answer: B

View Text Solution

13. Give that the roots of $x^3 3px^2+r=0$ are in harmonic progression. Then

A. $2q^3=r(3pq-r)$

B. $q^3=r(3pq-r)$

C. $q^3=-r(3pq-r)$

D. $3pq = r(r + 3pq)$

Answer: A

View Text Solution

14. If α, β, γ are the roots of $x^3 + px^2 + qx + r = 0$, then $\alpha^2 + \beta^2 + \gamma^2 =$

A. $p^3 - 3pq + r$

B. $p^2 - 2pq + r$

C. $3pq - 3r - p^3$

D. $3pq + 3r + p^3$

Answer: C

View Text Solution

15. The number of proper divisors of the number of obtained by dividing 13! With 100 is

A. 216

B. 430

C. 214

D. 790

Answer: B

View Text Solution

16. In an admission test, there are 15 multiple choice questions. Each question is followed by 4 alternatives to choose. Out of these there may be one or more than correct answers. If a student attempts all the 15 questions and marks the answers randomly, then number of different ways he can answer the question the question paper is

A. $4 \times {}^{15}C_4$

B. 15^{15}

C. 4^{15}

D. $4!.\ 15!$

Answer: B

View Text Solution

17. The absolute value of numerically greatest term in the expansion of $(2x - 3y)^{12}$ when $x = 3, y = 2$ is

A. ${}^{12}C_5 6^{12}$

B. ${}^{12}C_6 6^{12}$

C. ${}^{12}C_4 6^{12}$

D. ${}^{12}C_9 6^{12}$

Answer: B

View Text Solution

18. The sum of infinite terms of series

$\frac{3}{10}+\frac{3.7}{10.15}+\frac{3.7.9}{10.15.20}+\ldots$ to ∞ is

A. $\sqrt[4]{125}-1$

B. $\frac{5\sqrt{5}}{3\sqrt{3}}-\frac{8}{5}$

C. $\sqrt[3]{4}-\frac{4}{3}$

D. $\sqrt{\frac{5}{3}}-\frac{6}{5}$

Answer: B

View Text Solution

19. If $\frac{3x+2}{(x+1)(2x^2+3)}=\frac{A}{x+1}+\frac{Bx+C}{2x^2+3}$ then $A-B+C=$

A. 1

B. 2

C. 3

D. 5

Answer: B

View Text Solution

20.

$\sin 10^\circ \sin 50^\circ \sin 60^\circ \sin 70^\circ = m$ and $\tan 20^\circ \tan 40^\circ \tan 60^\circ \tan 80^\circ = n$

then $\frac{n}{m} =$

A. $\frac{3\sqrt{3}}{16}$

B. $16\sqrt{3}$

C. $\frac{16}{\sqrt{3}}$

D. $8\sqrt{3}$

Answer: B

View Text Solution

21. Assertion (A) : If $\alpha = 12^\circ, \beta = 15^\circ, \gamma = 18^\circ$ then $\tan 2\alpha \tan 2\beta + \tan \beta \tan 2\gamma + \tan 2\gamma \tan 2\alpha = 1$

Reason (R): in ΔABC, $\tan. \frac{A}{2} \tan. \frac{B}{2} \tan. \frac{C}{2} + \tan. \frac{C}{2} \tan. \frac{A}{2} =$

Which of the following is true?

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

B. Both (A) and (R) are true, but (R) is not the correct explanation of (A)

C. (A) is true, but (R) is false

D. (A) is false, but (R) is true

Answer: A

View Text Solution

22. $\cot \theta - \tan \theta - 2 \tan 2\theta - 4 \tan 4\theta$

A. $4\cot 8\theta - \tan 6\theta$

B. $\cot 8\theta + \tan 3\theta$

C. $\cot 8\theta + \cot 6\theta$

D. $8\cot 8\theta$

Answer: D

View Text Solution

23. If the general solution of $\sin x + 3\sin x + \sin 5x = 0$ is $x = y$ then the set of all values of cos y is

A. $\left\{-1, -\frac{\sqrt{3}}{2}, \frac{\sqrt{3}}{2}, 1\right\}$

B. $\left\{-1, \frac{1}{2}, 1\right\}$

C. $\left\{-\frac{\sqrt{3}}{2}, 0, 1, \frac{\sqrt{3}}{2}\right\}$

D. $\left\{-1, -\frac{1}{2}, \frac{1}{2}, 1\right\}$

Answer: D

View Text Solution

24. If $\cos^{-1} 2x + \cos^{-1} 3x = \frac{\pi}{3}$ then $x =$

A. $\frac{\sqrt{3}}{2\sqrt{7}}$

B. $\frac{\sqrt{3}}{\sqrt{7}}$

C. $\frac{\sqrt{2}}{\sqrt{5}}$

D. $\frac{\sqrt{3}}{2\sqrt{5}}$

Answer: A

View Text Solution

25. If $\cosh\beta = \sec\alpha\cos\theta, \sin h\beta = \cos ec\alpha\sin\theta$ then $\sinh^2\beta =$

A. $\sin\alpha\cos\alpha$

B. $\cos^2\alpha$

C. $\sin^2\alpha$

D. $\sin\alpha + \cos\alpha$

Answer: C

View Text Solution

26. In ΔABC, $\sin A$ and $\sin B$ satisfy $c^2x^2 - c(a+b)x + ab = 0$, then

A. the triangle is acute angled

B. the triangle is obtuse angled

C. $\sin C = \frac{\sqrt{3}}{2}$

D. $\sin A + \cos A = \frac{a+b}{c}$

Answer: D

View Text Solution

27. Let ABC be an isoceles triangled with BC as its base. Then $rr_1 =$

A. a^2

B. $\frac{a^2}{2}$

C. $R^2 \sin^2 A$

D. $R^2 \sin^2 2B$

Answer: A

View Text Solution

28. In a ΔABC, $a^4 + b^4 + c^4 = 2b^2c^2 + 2a^2b^2$ then $B =$

A. $\frac{\pi}{4}$ or $\frac{3\pi}{4}$

B. $\frac{\pi}{2}$

C. $\frac{\pi}{3}$ or $\frac{2\pi}{3}$

D. $\frac{\pi}{6}$ or $\frac{5\pi}{6}$

Answer: A

View Text Solution

29. If $\bar{a} = 2\bar{i} + 3\bar{j} + \bar{k}$, $\bar{b} = \bar{i} - 3\bar{j} - 5\bar{k}$ and $\bar{c} = 3\bar{i} - 4\bar{k}$ then match the items of list I with those of List II.

List I

(a) Unit vector in the direction opposite to that of $\bar{a} - \bar{b}$is

(b) If$\overline{AB} = \bar{a}, \overline{BC} = \bar{b}$then$\overline{CA}$

(c) If$\bar{a}, \bar{b}, \bar{c}$, are the position vectors of the vertice a triangle then, its centro

(d)If$\bar{d}$is a vector of magnitude$2\sqrt{14}$ and parallel to the vector$\bar{a}$, then$\bar{b} - \bar{a}$

A. $\begin{matrix} a & b & c & d \\ iv & iii & ii & i \end{matrix}$

B. $\begin{matrix} a & b & c & d \\ iv & ii & ii & i \end{matrix}$

C. $\begin{matrix} a & b & c & d \\ iv & iii & i & ii \end{matrix}$

D. $\begin{matrix} a & b & c & d \\ i & ii & iii & v \end{matrix}$

Answer: A

View Text Solution

30. If $2\bar{i}-\bar{j}+3\bar{k},\ -12\bar{i}-\bar{j}-3\bar{k},\ -\bar{i}+2\bar{j}-\bar{k}$ and $\lambda(i)-4\bar{k}$ are the position vectors of four coplanar points then $\lambda=$

A. -2

B. 6

C. 3

D. -6

Answer: B

View Text Solution

31. A point lying on the plane that passes through the points $\bar{i}+\bar{j}+\bar{k}, \bar{i}-2\bar{j}+3\bar{k}$ and $\bar{i}+2\bar{j}-3\bar{k}$ is

A. $-\bar{i}+2\bar{j}-3\bar{k}$

B. $-\bar{i}+\bar{j}-\bar{k}$

C. $\bar{i}+\bar{j}-\bar{k}$

D. $4\bar{i} + 2\bar{j} + 3\bar{k}$

Answer: C

View Text Solution

32. A non zero vector $\bar{a}$ is parallel to the line of intersection of the plane determine by the vectors $\bar{i}, \bar{i} + \bar{j}$ and the plane determined by vectors $\bar{i} - \bar{j}, \bar{i} + \bar{k}$. The angle between $\bar{a}$ and $\left(\bar{i} - 2\bar{j} + 2\bar{k}\right)$ is

A. $\frac{\pi}{6}$

B. $\frac{\pi}{4}$

C. $\frac{\pi}{3}$

D. $\frac{2\pi}{5}$

Answer: B

View Text Solution

33. The equation of the plane passing through the points with position vectors $A(-2\bar{i}+6\bar{j}-6\bar{k}), B(-3\bar{i}+10\bar{j}-9\bar{k})$ and $C(-5\bar{i}-6\bar{k})$ is

A. $\bar{r}.(2I-j-2k)=2$

B. $\bar{r}.(i-2j-k)=1$

C. $\bar{r}.(2i+j-2k)=3$

D. $\bar{r}.(i+2j-2k)=3$

Answer: A

View Text Solution

34. If $\bar{a}, \bar{b}$ and $\bar{c}$, are three vectors with magnitude 1,1 and 2 respectively and $\bar{a}, (\bar{a}\times\bar{c})+\bar{b}=0$, then the angle between $\bar{a}$ and $\bar{c}$ is

A. $\frac{2\pi}{5}$

B. $\frac{\pi}{3}$

C. $\frac{\pi}{4}$

D. $\frac{\pi}{6}$

Answer: D

View Text Solution

35. The coefficient of variation of the first n natural numbers is

A. $\frac{100}{\sqrt{3}}(n-1)$

B. $\frac{100}{\sqrt{3}}\sqrt{\frac{n+1}{n-1}}$

C. $\frac{\sqrt{3}}{100}\sqrt{\frac{n+1}{n-1}}$

D. $\frac{100}{\sqrt{3}}\sqrt{\frac{n-1}{n+1}}$

Answer: D

View Text Solution

36. Two distributions A and B have the same mean. If their coefficients of variations are 6 and 2 respectively and σ_A, σ_B are their standard deviations, then

A. $\sigma_A = 3\sigma_B$

B. $3\sigma_A = \sigma_B$

C. $\sigma_A = 2\sigma_B$

D. $2\sigma_A = \sigma_B$

Answer: A

View Text Solution

37. From a certain population, the probability of choosing a colour blind man is $\frac{1}{20}$ and that of a colour blind woman is $\frac{1}{10}$. If a randomly chosen person is found to be colour blind, then the probability that the person is a man is

A. $\frac{2}{9}$

B. $\frac{2}{3}$

C. $\frac{1}{3}$

D. $\frac{1}{9}$

Answer: C

View Text Solution

38. From a lot containing n good and m bad articles, if 2 articles, are picked at random in succession without replacement, then the probability that the second article picked is bad is

A. $\frac{m}{m+n}$

B. $\frac{m-1}{m+n}$

C. $\frac{(n-1)(m-1)}{(m+n)^2}$

D. $\frac{mn}{(m+n)^2}$

Answer: A

View Text Solution

39. In a class room 5% of the boys and 2% of the girls are taller than 1.6 metres. The class consists of 60% girl students. The probability that a randomly selected student is taller than 1.6 metres is

A. $\frac{121}{125}$

B. $\frac{5}{8}$

C. $\frac{3}{8}$

D. $\frac{4}{125}$

Answer: D

View Text Solution

40. The probability of securing a success in a trial is three times that of a failure. The probability of getting at least 4 successes in 5 trails is

A. $\frac{649}{1024}$

B. $\frac{81}{128}$

C. $\frac{27}{64}$

D. $\frac{243}{1024}$

Answer: B

View Text Solution

41. If the line joining the points A$(b\cos\alpha, b\sin\alpha$ and $B(a\cos\beta, a\sin\beta)$ is extended to the point N (x, y) such that $AN : NB = b : a$ then

A. $x\frac{\cos(\alpha-\beta)}{2} + y\frac{\sin(\alpha+\beta)}{2} = 0$

B. $x\frac{\cos(\alpha-\beta)}{2} + y\frac{\sin(\alpha-\beta)}{2} = 0$

C. $x\frac{\cos(\alpha+\beta)}{2} + y\frac{\sin(\alpha+\beta)}{2} = 0$

D. $x\frac{\cos(\alpha+\beta)}{2}+y\frac{\sin(\alpha+\beta)}{2}=0$

Answer: C

View Text Solution

42. A straight line $x-2y-4=0$ is shifted parallel to it by 3 units away from the origin and the rotated by an angle of 30° in the anti-clockwise direction. If the slope of the new line formed is m, then the integral part of 'm' is

A. -1

B. 0

C. 1

D. 2

Answer: C

View Text Solution

43. If α and β are then angles made by the normals drawn from the origin to the lines $x + y + \sqrt{2} = 0$ and $x - \sqrt{3}y - 2 = 0$ with the positive direction of the X - axis respectively measured in anti - clockwise direction, then $\alpha + \beta =$

A. $\frac{13\pi}{12}$

B. $\frac{29\pi}{12}$

C. $\frac{11\pi}{12}$

D. $\frac{35\pi}{12}$

Answer: D

View Text Solution

44. The straight lines $x + 3y - 4 = 0, x + y - 4 = 0$ and $3x + y - 4 = 0$

A. form an isosceles triangle

B. are concurrent

C. form an equilateral triangle

D. form a right angled isoceles triangle

Answer: A

View Text Solution

45. The combined equation of the straight lines passing lines $12x^2 - 20xy + 7y^2 = 0$ and the line $2x - 3y + 4 = 0$ is (α, β). Then $\alpha = 2\beta =$

A. $2x^2 + 3xy - 2y^2 - 7x + y + 1 = 0$

B. $xy - x - y + 1 = 0$

C. $xy + 2y^2 - x - 5y - 3 = 0$

D. $2x^2 - xy + y + 1 = 0$

Answer: B

View Text Solution

46. The centroid of the triangle formed by the pair of straight lines $12x^2 - 20xy + 7y^2 = 0$ and the line $2x - 3y + 4 = 0$ is (α, β). Then $\alpha + 2\beta =$

A. $-\frac{4}{3}$

B. 2

C. 8

D. $-\frac{8}{3}$

Answer: C

View Text Solution

47. The equation of the bisector of the angles between the lines joining the origin to the points of intersection of the curve $x^2 + xy + y^2 + x + 3y + 1 = 0$ and the straight line $x + y + 2 = 0$ is

A. $2x^2 - 4xy + y^2 = 0$

B. $x^2 - 4x + y^2 = 0$

C. $2x^2 + 4xy + y^2 = 0$

D. $x^2 + 4xy - y^2 = 0$

Answer:

View Text Solution

48. Consider the following statement I. The intercept made by the circle $x^2 + y^2 - 2x - 4y + 1 = 0$ on Y - axis is $2\sqrt{3}$

II. The intercept made by the circle $x^2 + y^2 - 4x - 2y + 6 = 0$ on X - axis is $2\sqrt{2}$

III. The straight line $y = 2x + 1$ cuts the circle $x^2 + y^2 = 9$ at two distinct points

Then which one of the following options is correct?

A.

I	II	III
True	True	True

B.

I	II	III
True	True	False

C.

I	II	III
True	False	True

D.

I	II	III
False	False	True

Answer: C

View Text Solution

49. If the circles $x^2 + y^2 + 2kx - 4y + 1 = 0$ and $x^2 + y^2 - 8x - 12y + 43 = 0$ touch each other then $k =$

A. 2

B. 1

C. -1

D. -2

Answer: C

View Text Solution

50. For all real values of k, the point which lies on the polar of $(k, k+1)$ with respect to the circle $x^2 + y^2 + 4x - 8y - 5 = 0$ is

A. $(3, -1)$

B. $(3, 1)$

C. $(2, -2)$

D. $(2, 3)$

Answer: A

View Text Solution

51. The number of common tangents to the circles $x^2 + y^2 + 4x = 0$ and $x^2 + y^2 - 2x = 0$ is

A. 4

B. 3

C. 2

D. 1

Answer: B

View Text Solution

52. If $\frac{2}{\sqrt{5}}$ is the length of the common chord of the circles $x^2 + y^2 + 2x + 1 = 0$ and $x^2 + y^2 + x3y + 2 = 0, \alpha \neq 0$ then $\alpha =$

A. 4

B. 3

C. 2

D. 1

Answer: A

View Text Solution

53. Match the items of List - I with those of List - II

List - I

(a) Equation of the tangent drawn at $\left(2, \sqrt{8}\right)$ on the curve $y^2 = 4x$ is

(b) Equation of the normal to the curve $y^2 = 16x$, that makes an angle of 45

(c) The chord joining the points (x_1, y_1) and (x_2, y_2) on the curve $y^2 = 12x$

(d) A value of k for which $x - 3 = 0$ is the directrix of the curve $y^2 - kx +$

A. $\begin{matrix} a & b & c & d \\ v & iv & iii & ii \end{matrix}$

B. $\begin{matrix} a & b & c & d \\ vi & v & ii & i \end{matrix}$

C. $\begin{matrix} a & b & c & d \\ iv & vi & i & ii \end{matrix}$

D. $\begin{matrix} a & b & c & d \\ iv & vi & ii & iii \end{matrix}$

Answer: C

View Text Solution

54. An equilateral triangle is inscribed in the parabola $y^2 = 16ax$ with one of its vertices at the origin. Then the centroid of that triangle is

A. $(8a, 0)$

B. $(16a, 0)$

C. $(32a, 0)$

D. $(48a, 0)$

Answer: C

View Text Solution

55. If the straight line $8x + 3\sqrt{2}y = 36$ touches the ellipse $\frac{x^2}{9} + \frac{y^2}{4} = 2$ at (a, b) then $a + \sqrt{2}b =$

A. $\frac{36}{5\sqrt{2}}$

B. $\frac{8}{3}$

C. $\frac{12 + 2\sqrt{2}}{3}$

D. $\frac{16}{3}$

Answer: D

View Text Solution

56. For an ellipse with eccentricity $\frac{1}{2}$, the centre is at the origin. If one of its directrices is $x = 4$, then the equation of the ellipse is

A. $3x^2 + 4y^2 = 12$

B. $3x^2 + 4y^2 = 49$

C. $3x^2 + 4y^2 = 1$

D. $4x^2 + 3y^2 = 12$

Answer: A

View Text Solution

57. If the product of the slopes of the tangents drawn from an external point P to the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ is a constant k^2, then the locus of P is

A. $y^2 + b^2 = k^2(x^2 - a^2)$

B. $y^2 - b^2 = k^2(x^2 - a^2)$

C. $x^2 + b^2 = k^2(y^2 - a^2)$

D. $x^2 - b^2 = k^2(y^2 - a^2)$

Answer: A

View Text Solution

58. Let A, B, C be three points on $\overrightarrow{OX}$, $\overrightarrow{OY}$, $\overrightarrow{OZ}$ respectively at the distances $3, 6, 9$ from origin, Let Q be the point $(2, 5, 8)$ and P be the point equidistant from O, A , B, C. Then the coordinates of the point R which divides PQ in the ration 3 : 2 is

View Text Solution

59. If the direction cosines of two lines are such that $l + m + n = 0$, l^2 + m^2 -n^2` then the angle between them is

A. $\frac{\pi}{6}$

B. $\frac{\pi}{4}$

C. $\frac{\pi}{3}$

D. $\frac{\pi}{2}$

Answer: C

View Text Solution

60. If the line joining the point A $(1, 0, 0)$ and $B(0, 0, 1)$ is a normal to the plane π which passes through the point A, then the angle between the planes π and $x + y + z = 6$ is

A. $\frac{\pi}{6}$

B. $\frac{\pi}{4}$

C. $\frac{\pi}{3}$

D. $\frac{\pi}{2}$

Answer: D

View Text Solution

61. The number of points at which the function $f(x) = \frac{\sqrt{11 + |x| - 6\sqrt{2 + |x|}}}{6 - 2\sqrt{2 + |x|}}$ is discontinuous in $(-\infty, \infty)$ is

A. 1

B. 0

C. 2

D. 3

Answer:

View Text Solution

View Text Solution

62. If $f(x) = \begin{cases} \frac{\sqrt{1+px}-\sqrt{1-px}}{x}, & -1 \leq x < 0 \\ \frac{2x+1}{x-2} & 0 \leq x \leq 1 \end{cases}$ is continues on $[-1, 1]$ then $p =$

A. $-\frac{1}{2}$

B. $-\frac{1}{4}$

C. $\frac{1}{2}$

D. 2

Answer: A

View Text Solution

63. If $y = \tan^{-1}(\sin\sqrt{x}) + \cos ec^{-1}(e^{2x+1})$ then $\frac{dy}{dx} =$

A. $\frac{1}{\sqrt{x}(1+\sin^2\sqrt{x})}$

B. $\frac{\cos\sqrt{x}}{2\sqrt{x}(1+\sin^2\sqrt{x})} - \frac{2}{e^{4x+2}-1}$

C. $\frac{\cos\sqrt{x}}{\left(1+\sin^2\sqrt{x}\right)}+\frac{2}{\sqrt{e^{4x+2}+1}}$

D. $\frac{1}{2\sqrt{x}}\frac{\cos\sqrt{x}}{\left(1+\sin^2\sqrt{x}\right)}-\frac{2}{\sqrt{e^{2x+1}-1}}$

Answer: B

View Text Solution

64. If $f: R \to R$ is such that $f(3)=16, f'(3)=4$, then $\lim_{x\to 3}\frac{xf(3)-3f(x)}{x-3}=$

A. 4

B. 6

C. 8

D. 12

Answer: A

View Text Solution

65. If $y = e^x(\log x)$, then $xy_2 + (x-1)y =$

A. $(2x-1)y_1$

B. $(x-1)y_1$

C. $(4-xy)y_1$

D. $(3x-1)y_1$

Answer: A

View Text Solution

66. Let $f(x) = e^x \cos x + 1$. Which of the following statements is always true?

A. Between any two consecutive roots $f(x) = 0$ of there is always a roots of $e^x \sin x + 1 = 0$

B. Between any two consecutive roots of $f(x) = 0$ there is always a roots of $e^x \sin x - 1 = 0$

C. Between any two consecutive roots $f(x) = 0$ of there is always a root of $e^x \cos x = 0$

D. Between any two consecutive roots $f(x) = 0$ of there is always a root of $e^x \sin x = 0$

Answer: A

View Text Solution

67. The radius of a circular plate is increasing at the rate of 0.01 cm/ sec. When the radius is 12 cm, the rate at which the area increases is (in square cm/sec)

A. 60π

B. 24π

C. 1.2π

D. 0.24π

Answer: D

View Text Solution

68. Let $f(x) = x^2 e^{-2x}$, $x > 0$. The maximum value of $f(x)$ is

A. 0

B. $\frac{1}{e^2}$

C. $\frac{1}{4e^2}$

D. $\frac{1}{2e}$

Answer: B

View Text Solution

69. Let f(x) be differentiable on $[1, 6]$ and $f(1) = -2$. If f(x) has only one root in $(1, 6)$ then there exists $c \in (1, 6)$ such that

A. $f'(c) = \frac{1}{10}$

B. $f'(c) < \frac{2}{5}$

C. $f'(c) < \frac{1}{5}$

D. $f'(c) > \frac{2}{5}$

Answer: D

View Text Solution

70. If $\int \phi(x)dx = \psi(x)$ then $\int (\phi oh)(x)h(x)h'(x)dx =$

A. $(\phi oh)(x)\phi'(x) - \int (\phi oh)(x)h'(x)dx + c$

B. $(\psi oh)(x)h(x) - \int (\psi' oh)(x)h'(x)dx + c$

C. $(\psi oh)(x)\phi(x) - \int (\psi oh)(x)\phi'(x)dx + c$

D. $(\psi o\phi)(x)h(x) - \int (\psi o\phi)(x)h'(x)dx + c$

Answer: B

View Text Solution

71. If $f\left(\frac{t+1}{2t+1}\right) = t+1$, then $\int f(x)dx =$

A. $\frac{x^2}{2} + c$

B. $\log(2x-1) + \frac{1}{2}\log(x+1) + c$

C. $\frac{1}{2}\log(2x-1) + c$

D. $\frac{x}{2} + \frac{1}{4}\log(2x-1) + c$

Answer: D

View Text Solution

72. $\int \frac{x^B - 9x^2 + 18}{x^4 - 3x^2 + 3} dx =$

A. $\frac{x^4}{4} + x^3 + 6x^2 + c$

B. $\frac{x^5}{5} + \frac{x^4}{4} + 6x + c$

C. $\frac{x^5}{5} + \frac{x^3}{2} + 6x + c$

D. $\frac{x^5}{5} - \frac{x^3}{2} + 6x^2 + c$

Answer: C

View Text Solution

73. $\int (\cot x \cot(x+\alpha) + 1)dx =$

A. $\cot \alpha \log\left(\left|\frac{\sin x}{\sin(x+\alpha)}\right|\right) + c$

B. $\log|\sin x \sin(x+\alpha)| + x + c$

C. $\log|\sin x \cos(x+\alpha)| + x + c$

D. $\tan \alpha \log\left(\left|\frac{\cos x}{\sin(x+\alpha)}\right|\right) + c$

Answer: D

View Text Solution

74. If $\lim_{n \to \infty} \sum_{r=1}^{n} \frac{4r^3}{r^4 + n^4} = p$, then $e^p =$

A. 4

B. 3

C. 2

D. 1

Answer: C

View Text Solution

75. $\int_{e^0}^{\frac{\pi}{2}} \sqrt{\frac{1-\sin 2x}{1+\sin 2x}} dx =$

A. 1

B. $2\log 2$

C. $2\log\sqrt{3}$

D. 2

Answer:

View Text Solution

76. The area bounded by the curve $y = x^3 - 3x^2 + 2x$ and the X - axis si

(in square units)

A. $\frac{1}{2}$

B. $\frac{5}{2}$

C. 1

D. 4

Answer: A

View Text Solution

77. The general solution of the differential equation $\cos(x + y)dy = dx$

is

A. $y = \sec(x + y) + c$

B. $y - \frac{\tan(y)}{2} = x + c$

C. $y = \tan\left(\frac{x+y}{2}\right) + c$

D. $y = \frac{1}{2}\tan(x+y) + c$

Answer: C

View Text Solution

78. The general solution of the differential equation $(x^3 - 3xy^2)dx = (y^3 - 3x^2y)dy$ is

A. $c^2(x^2+y^2) = (y^2 - x^2)$

B. $c^2(x^2+y^2) = (y^2 - x^2)^2$

C. $c^2(x^2+y^2)^2 = (y^2 - x^2)$

D. $c^2(x^2-y^2)^2 = (y^2 - x^2)$

Answer: C

View Text Solution

79. The differential equation corresponding to all the circles lying in the first quadrant and touching the coordinates axes is

A. $(x-y)^2\left[1+\left(\frac{dy}{dx}\right)^2\right]=\left(x+y\frac{dy}{dx}\right)^2$

B. $(x-y)^2\left[1+\frac{dy}{dx}\right]^2=\left(x+y\frac{dy}{dx}\right)^2$

C. $(x-y)^2\left[1+\left(\frac{dy}{dx}\right)^2\right]=x+y\left(\frac{dy}{dx}\right)^2$

D. $(x-y)^2\left[1+\frac{dy}{dx}\right]=\left(x+y\frac{dy}{dx}\right)^2$

Answer: A

View Text Solution

Physics

1. Match the entries in column A with those in column B.

Column - A

(a) Unified interaction reducing the number of fundamental forces from fou

(b) Force between two molecules separated by a distance near about the su

(c) Nuclear binding force

(d) Bodies of astronomical proportions

A. $\begin{matrix} a & b & c & d \\ iii & iv & i & ii \end{matrix}$

B. $\begin{matrix} a & b & c & d \\ iii & i & ii & iv \end{matrix}$

C. $\begin{matrix} a & b & c & d \\ iii & i & iv & ii \end{matrix}$

D. $\begin{matrix} a & b & c & d \\ ii & i & iii & iv \end{matrix}$

Answer: A

View Text Solution

2. Assertion (A) : Electromagnetic force is enormously strong as compared to gravitational force. Yet, gravity domination in the large - scale phenomena (e.g. formation of galaxies).

Reason (R) : Existence of positive and negative charges make matter mostly electrically neutral.

Which of the following is true?

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

B. Both (A) and (R) are true, but (R) is not the correct explanation of (A)

C. (A) is true, but (R) is false

D. (A) is false, but (R) is true

Answer: A

View Text Solution

3. An object moves in a straight line with deceleration whose magnitude varies with velocity s $3v^{\frac{2}{3}}$. If at an initial point, the velocity is 8/m sec, then the distance travelled by the object before it stops is

A. 2m

B. 4m

C. 6m

D. 8m

Answer: B

View Text Solution

4. A particle starts from origin at time $t = 0$ and moves in positive X - direction. Its velocity $\bar{v} = 10t\hat{i}$ cm/ sec. The distance covered by the particle in 8 sec. will be

A. 320 cm

B. 80 cm

C. 120 cm

D. 640 cm

Answer: A

View Text Solution

5. Consider an object kept at the centre, in the XY plane, on which five coplanar force act as shown in the figure. The resultant force on the object is

A. 6.5 N, 330°

B. 6.5 N, 300°

C. 6.5 N, 30°

D. 5.7 N, 331°

Answer: A

View Text Solution

6. Consider an object making uniform motion around a circle of radius 5m with tangential velocity 2 ms^{-1}. The time it takes to complete 2 revolutions and the magnitude of acceleration respectively are

A. $0.2\pi \& 0.8ms^{-2}$

B. $0.5\pi \& 1.0ms^{-2}$

C. $10\pi s \& 0.8ms^{-2}$

D. $5\pi s 5ms^{-2}$

Answer: C

View Text Solution

7. A small block starts sliding down an inclined plane forming an angle 45° with horizontal. The coefficient of friction μ, x varies with distance covered by the block before it stops is

A. $\sqrt{\frac{3}{c}}$

B. $\sqrt{3c}$

C. $\sqrt{c}$

D. $\sqrt{\frac{1}{c}}$

Answer: A

View Text Solution

8. A moveable steel plate is placed between fixed steel and brass plates and the stack of plates is subjected to a weight of 100 N as shown in the figure. The coefficient of kinetic friction for steel one steel is 0.57 and for steel on brass is 0.44. Assuming that the entire weight comes onto the stack and that the weight of the plates is negligible in comparison to the applied weight, the force required to move the middle plate in N is

A. 13

B. 101

C. 440

D. 570

Answer: B

View Text Solution

9. A car of mass 1200 kg (together with driver) is moving with a constant acceleration of $2m/s^2$. How much power does the speed reaches $20m/s^2$.? (assume that the coefficient of friction between the car and the road is 0.5)

A. 48000 W

B. 120000 W

C. 168000 W

D. 288000 W

Answer: C

View Text Solution

10. A ball moving with a velocity v, collides head on with a stationary second ball of same mass. After collision the velocity of the first ball is

reduced to 0.15 v. The kinetic energy of the system is decreased nearly by

A. 0.2

B. 0.25

C. 0.3

D. 0.4

Answer: B

View Text Solution

11. A uniform disk of mass 100 kg and radius 2 m is rotating at 1 rad/s about a perpendicular axis passing through its centre A boy of mass 60 kg. standing at the centre of the disk. The final angular velocity of the (rad/s) is

A. 0.77

B. 0.5

C. 1

D. 2

Answer: A

View Text Solution

12. A force is $\vec{F} = A\hat{j}$ applied to a point whose radius vector $\vec{r}1 = a\vec{i}$ while a force $\vec{F}_2 = B\hat{i}$ is applied to the point whose radius vector $\vec{r}_2 = b\hat{j}$. Both the radius vectors are determined relative to the origin of the coordinates axes 'O' . The moment of the force relative to 'O' is

A. $(aA - bB)\hat{k}$

B. $(aA - bB)\hat{j}$

C. $(ab - AB)\hat{k}$

D. $(aB - bA)\hat{j}$

Answer: A

View Text Solution

13. The density of a solid sphere of radius R is $\rho(r) = 20\frac{r^2}{R^2}$ where r is the distance from is center. If the gravitational field due to this sphere at a distance 4 R from its center is E and G is the gravitational constant, the ratio $\frac{E}{GR}$ is

A. $\frac{\pi}{5}$

B. 3π

C. $3\frac{\pi}{2}$

D. π

Answer: D

View Text Solution

14. In a ten silt on a metal bar of diameter 0.015 m and length 0.2 m, the relation limit is found to be $F = 97.2 \times 10^6(\Delta L)$, where F is the load in N and ΔL is the elongation in m. The young's modulus of the material in Gpa is

A. 75.5

B. 85.6

C. 98.7

D. 110

Answer: D

View Text Solution

15. An ideal gas has molar heat capacity C_v at constant volume. The gas undergoes a process where in the temperature changes as $T = T_0\left(1 + \alpha V^2\right)$, where T and V are temperature and volume respectively, T_0 and a are positive constants. The molar heat capacity C of the gas is given as $C = C_v + Rf(v)$, where $f(v)$ is a function of volume. The expression for $f(v)$ is

A. $\dfrac{\alpha V^2}{1 + \alpha V^2}$

B. $\dfrac{1 + \alpha V^2}{2\alpha V^2}$

C. $\left(\alpha V^2\left(2+\alpha V^2\right)\right.$

D. $\frac{1}{2\alpha V^2(1+\alpha V^2)}$

Answer: B

View Text Solution

16. A container is filled with liquid that cools from $100^\circ C$ to $70^\circ C$ in 5 min. when kept at room temperature of $30^\circ C$. The time that it must have taken to cool down to $80^\circ C$ from its initial temperature approximately is

A. 1.7 min

B. 2.6 min

C. 8.2 min

D. 4.1 min

Answer:

View Text Solution

17. An ideal gas in a cylinder is compressed adiabatically to one - third of its original volume. A work of 45 J is done on the gs by the process. The charge in internal energy of the gas and the heat flowed into the gas, respectively are

A. 45 J and zero

B. -45 J and zero

C. 45 J and heat flows out of the gas

D. -45 J and heat flows into the gas

Answer: A

View Text Solution

18. In a cubic container of inner side length 10 cm, nitrogen gas of 100 kPa pressure is maintained at 300 K. If the pressure inside the gas is

increased to 300 kPa by adding oxygen gas, the ratio of number of N_2 to O_2 molecules in the container is

A. 1.5 g, 4.5 g

B. $2.8g, 3.2g$

C. 3.0 g, 3.0 g

D. 2.4 , 3.6 g

Answer: A

View Text Solution

19. A source of sound whose frequency is 1000 Hz is moving with a speed 33 m/s. The waves reflected by a fixed obstacle are registered by a receiver that moves together with the source. (the speed of the sound waves is 330 m/s), the frequency registered by the receiver is

A. 0.9 kHz

B. 1.1 kHz

C. 1.2 kHz

D. 2.2 kHz

Answer: C

View Text Solution

20. figure shows a ray of light entering and passing through a dense glass slab and emerging from the other side. If the angle $i = 60^\circ$, slab thickness b = 0.04 m and the refractive index of glass $= \sqrt{3}$, the parallel shift 'd' between the emerging and entering rays in mm is

A. $\sqrt{\frac{3}{4}}$

B. $\sqrt{\frac{4}{5}}$

C. $\frac{40}{\sqrt{3}}$

D. $5\sqrt{3}$

Answer: C

View Text Solution

21. Let S_1 be the amount of Rayleigh scattered light of wavelength λ_1 and S_2 that of light of wavelength λ_2 from a particle of size 'a'. Which of the following statements is true?

A. $\frac{S_1}{S_2} = \left(\frac{\lambda_2}{\lambda_1}\right)^4$ if $\lambda_1, \lambda_2 > > a$

B. $\frac{S_1}{S_2} = \left(\frac{\lambda_1}{\lambda_2}\right)^4$ if $\lambda_1, \lambda_2 > > a$

C. $\frac{S_1}{S_2} = \left(\frac{\lambda_2}{\lambda_1}\right)^4$ if $\lambda_1, \lambda_2 < < a$

D. $\frac{S_1}{S_2} = \left(\frac{\lambda_1}{\lambda_2}\right)^4$ if $\lambda_1, \lambda_2 < < a$

Answer: A

View Text Solution

22. In a Young's double slit experiment, a monochromatic light of wavelength 600 nm is used. If the two slits are covered by transparent

sheets of thickness 0.132 mm and 0.1 mm of refractive index 1.5, the number of fringes that will shift due to introduction of the sheets are

A. 20

B. 40

C. 60

D. 80

Answer: D

View Text Solution

23. The volume charge density in a spherical ball of radius R varies with distance r from the centre s $\rho(r) = \rho_0\left[1 - \left(\frac{r}{R}\right)^3\right]$ where ρ_0 is a constant. The radius at which the field be maximum is

A. $\frac{R}{2^{1/3}}$

B. R

C. $\frac{R}{2}$

D. $\frac{R^{1/3}}{2}$

Answer: A

View Text Solution

24. The potential $\phi(x, y)$ of an electrostatic field $\vec{E} = a\left(y\hat{i} + x\hat{j}\right)$ si [a is constant and $\hat{i}$ and $\hat{j}$ are unit vectors along X and Y axes]

A. $-2axy + c$ (c is a constant)

B. $axy + c$ (c is a constant)

C. $a^2xy + c$ (c is a constant)

D. $a(xy)^2 + c$ (c is a constant)

Answer: A

View Text Solution

25. A moving coil galvanometer has a rectangular wire coil of enclosed are 0.001 m^2 and 500 turns. The coil operates in a radial magnetic field of 0.2 T and carries a current of $6\pi \times 10^{-8}10^{-8}A$. If the torsional spring constant is 6×10^{-7} N.m/r the angular deflection of the coil in radians is

A. $\frac{\pi}{100}$

B. $\frac{\pi}{200}$

C. $\frac{\pi}{300}$

D. $\frac{\pi}{400}$

Answer: A

View Text Solution

26. A charge q enters a region having electric field $\vec{E}$and magnetic field $\vec{B}$ with velocity $\vec{v}$. If it continues to move with the same velocity then which of the following statements is not true

A. $\vec{E}.\vec{B} = 0$

B. $\vec{E}.\vec{v}=0$

C. If $\vec{v}.\vec{B}=0$ then $\vec{v}=\frac{\vec{E}\times\vec{B}}{\vec{B}.\vec{B}}$

D. $\vec{v}\times\vec{E}=\vec{B}$

Answer: D

View Text Solution

27. A conducting rod of length L lies in X - Y plane and makes an angle 30° with the X - axis . One end of the rod lies at origin initially. A magnetic field also exists in the region pointing along positive Z - direction. The magnitude of the magnetic field varies with Y as $B_0\left(\frac{y}{L}\right)^3$ where B_0 is a constant. At some instant the rod starts moving with a velocity v_0 along X - axis. The emf induced in the rod is

A. $\frac{B_0V_0L}{64}$

B. $\frac{B_0V_0L}{16}$

C. B_0V_0L

D. $64B_0V_0L$

Answer: A

View Text Solution

28. An oscillating circuit of a capacitor with capacitance $C = 10\mu F$, a coil with inductance $L = 6.0\mu H$ and active resistance $R = 10\Omega$. The mean power that should be fed to the circuit to maintain undamped harmonic oscillations with an external driving power with 50 Hz and a V_m of 280 V is

A. 3.8 W

B. 48 W

C. 3 m W

D. 48 m W

Answer: A

View Text Solution

29. If the magnetic field of a plane electromagnetic wave is given by $5 \times 10^{-6} \sin\left(0.6 \times 10^{2} x + 0.5 \times 10^{10} t\right)$, then the speed of the wave is

A. 0.83×10^{7} m/s

B. 0.83×10^{8} m/s

C. 5.24×10^{8} m/s

D. 5.24×10^{9} m/s

Answer: B

View Text Solution

30. An isolated lead ball is charged upon continuous irradiation by EM radiation of wavelength $(\lambda) = 221$ nm. The maximum potential attained by the lead ball, if its work function is $4.14eV$, is

(Take $h = 6.63 \times 10^{-34} J.\ s, c = 3 \times 10^{6} m/s, e = 1.6 \times 10^{-19}$)

A. 1.49 V

B. 2.67 V

C. 3.14 V

D. 0.51 V

Answer: A

View Text Solution

31. An energy of 13.6 eV is equal to

A. 0.518×10^{-25} Kcal

B. 6.04×10^{-25} kWh

C. $2.17 \times 10^{-10} j$

D. 2.17×10^{-15} kN. M

Answer: B

View Text Solution

32. The frequency of light emitted when the electron makes transition from the level of principal quantum number $n = 2$ to the level with $n = 1$ is

(Take the ionization energy of hydrogen to be $13.6eV$ and $h = 4 \times 10^{-15} eV - \sec$)

A. 2.55×10^{15} Hz

B. 1.7×10^{15} Hz

C. 3.4×10^{15} Hz

D. 5.1×10^{15} Hz

Answer: A

View Text Solution

33. In a junction transistor, the collector current changes by 6.8 mA if the emitter current is changed by 7 mA. For such transistor the current

amplification factor is

A. 30

B. 34

C. 40

D. 45

Answer: B

View Text Solution

34. In $p-n$ junction diode, and electric field of magnitude 2×10^5 V/m exists in the depletion region. A particle with charge $-3|e|$ can diffuse from n - side to P - side, if it has minimum kinetic energy $0.6eV$. The width of the depletion region of the P - n junction is

A. 300 nm

B. 600 nm

C. 1000 nm

D. 1200 nm

Answer: C

View Text Solution

35. A person tries to broadcast with the same antenna both the signal at 10^7 Hz and 10^6 Hz. If he receiver at some distance has to receive an equal strength for both the frequencies, the broadcaster has to approximately increase the signal strength at 10^6 Hz to 10^7 Hz by

A. $\frac{1}{10}$ times

B. 10 times

C. 100 times

D. $\frac{1}{100}$ times

Answer: C

View Text Solution

Chemistry

1. Statement (a) : $Na_2O < MgO < ZnO < P_4O_{16} -$ Acidic property

Statement (b) : $F > CI > Br -$ Electron gain enthalpy

Statement (c) : $M^{2-} > M^{-} > M^{+} > M^{2+}$ - ionic size

Statement (d) : The second ionisation enthalpy of Cu is more than second ionisation enthalpy of K.

Which of the following is the correct representation of True (T) / Fale(F) for the given statements

A. $\begin{matrix} a & b & c & d \\ T & T & F & F \end{matrix}$

B. $\begin{matrix} a & b & c & d \\ F & T & F & T \end{matrix}$

C. $\begin{matrix} a & b & c & d \\ F & F & F & T \end{matrix}$

D. $\begin{matrix} a & b & c & d \\ T & F & T & F \end{matrix}$

Answer: A

View Text Solution

2. Group the molecules/ ions according to bond order

A. $\left(O_2^{2-}, Li_2, O_2^{2+}\right)\left(F_2, N_2, He_2^{2+}\right)$

B. $\left(F_2, O_2^{2+}, N_2\right)\left(O_2^{2-}, He_2^{2+}, Li_2\right)$

C. $\left(O_2^{-}, Li_2, F_2He_2^{2+}\right)\left(N_2, O_2^{2+}\right)$

D. $\left(Li_2, F_2, O_2^{2+}\right)\left(N_2, O_2^{2-}, He_2^{2+}\right)$

Answer: C

View Text Solution

3. Match the bond order for the following molecules.

List - I	List - II
$(a) Li_2$	$(i) 3$
$(b) N_2$	$(ii) 1.5$
$(c) Bc_2$	$(iii) 1.0$
$(d) O_2$	$(iv) 0$
	$(v) 2$

The correct answer is

A.

a	b	c	d
ii	iii	i	v

B.
a	b	c	d
iii	i	iv	v

C.
a	b	c	d
iv	i	v	iii

D.
a	b	c	d
iii	ii	v	i

Answer: B

View Text Solution

4. Calculate the molality of 1 litre solution of 93% H_2SO_4 by w/v

[Math Processing Error]

A. 3.17

B. 8.5

C. 12.4

D. 10.42

Answer: D

View Text Solution

5. Amongst the chemical reactions given below, the reactions with increasing entropy are

(a) $H_2O_{(1)} \rightarrow H_2O_{(g)}$

(b) $C_{(g)} + CO_{2(g)} \rightarrow 2CO_{(g)}$

(c) $2H_{2(g)} + O_{2(g)} \rightarrow 2H_2O_{(1)}$

(d) $N_{2(g)} + O_{2(g)} \rightarrow$ Mixture of N_2 and O_2

A. a, b, c, d

B. a, b, c

C. a, b, d

D. b, c, d

Answer: C

View Text Solution

6. The IUPAC name of the following compound is

A. 2 - Hydroxy - 5 - oxoethyl cyclohexane

B. 2 - Ethyl - 4 - oxo cyclohexanol

C. 3 - Ethyl - 4 - hydroxy cyclohexanone

D. 6 - Hydroxy - 3 - oxoethyl cyclohexane

Answer: C

View Text Solution

7. NaCI is heated in an atmosphere of sodium vapour. The resultant yellow colour is due to the formation of

A. Frenket defect

B. Schottky defect

C. F - centers

D. Impurity defects

Answer: C

View Text Solution

8. Henry's law constant for CO_2 in water is 1.67 kbar at $25^\circ C$. The quantity of CO_2 in 1000 mL of soda water when packed under 5 bar CO_2 pressure at $25^\circ C$ is

A. 0.084 mol

B. 0.167 mol

C. 0.252 mol

D. 0.336 mol

Answer: B

View Text Solution

9. For a particular reaction, the rate constant becomes double on increasing temperature from $27^{\circ}C$ to $37^{\circ}C$. Calculate the approximate activation energy (in kcal mol^{-1})

$\left(R = 2\text{cal mol}^{-1}K^{-1}\right)$

A. 1289

B. 12.89

C. 1.28

D. 53.41

Answer: B

View Text Solution

10. Identify the correct statements from the following

(a) In the oxidation of oxalic acid with $KMnO_4$ in acid medium, Mn^{2+} acts as auto catalyst

(b) CdS colloidal solution can be precipitated by the addition of CI^- ions

(c) The gold numbers of three protective colloids (A, B, C) is $0.03, 25$ and 0.25 respectively. Their protective power follows the order $A > C > B$

(d) Physisorption is an irreversible process

A. a,d

B. b, c

C. a, c

D. a, b, c

Answer: C

View Text Solution

11. The oxidising and reducing agents respectively for the cyanide extraction of silver from agentite ore are?

A. O_2, CO

B. HNO_3, CO

C. O_2, Zn dust

D. HNO_3, Zn dust

Answer: C

View Text Solution

12. Consider the complexes

(a) $\left[Pd(NH_3)_2CIBr\right]$

(b) $\left[Pd(NH_3)_2CI_2\right]$

(c) $[Pd(en)CI_2]$

(d) $[pd(en)CIBr]$

(d) $\left[Pd(en)_2\right]CI_2$

(en = ethylenediamine)

The total number of geometrical isomers of (a) is same as the total number of geometrical isomers of

A. b

B. c

C. d

D. e

Answer: A

View Text Solution

13. Identify the monomers used in the manufacture of glyptal (X), dacron (Y) and nylon 2 - nylon 6 (Z).

A. 

B. 

C. 

D. 

Answer: C

View Text Solution

14. Which of the following is presents in RNA only?

A. 

B. 

C. 

D. 

Answer: D

View Text Solution

15. Match the following

A. $\begin{matrix} a & b & c & d \\ iv & ii & ii & i \end{matrix}$

B. $\begin{matrix} a & b & c & d \\ iii & i & ii & iv \end{matrix}$

C. $\begin{matrix} a & b & c & d \\ ii & iii & i & iv \end{matrix}$

D. $\begin{matrix} a & b & c & d \\ i & ii & iv & iii \end{matrix}$

Answer: A

View Text Solution

16. The major product of the following reaction is

A. 

B. 

C. 

D. 

Answer: C

View Text Solution

17. From the following reaction, identify the reactions that give carboxylic acids as products

A. (i, iii)

B. (i, iv)

C. (ii, iii)

D. (ii, iv)

Answer: B

View Text Solution

18. In the following reaction, the major product (P) formed is

A. 

B. 

C. 

D. 

Answer: D

View Text Solution