2021-12-18

1.The displacement time graph for two particles A & B are straight lines making angles of 30° & 60° with time axis. If velocity of A is v_A & B is v_B then value of $\frac{v_A}{v_B}$ is

$\frac{1}{2}$

$\frac{1}{\sqrt{3}}$

$\sqrt{3}$

$\frac{1}{3}$

2.A ball whose KE is E is thrown at an angle 45° with horizontal. The KE of ball at highest point is

E

$\frac{E}{2}$

$\frac{E}{\sqrt{2}}$

0

3.A mass is hanging on a spring balance which is kept in a lift. Lift ascends with acceleration then reading of balance

Increases

Decreases

No change

Change depends on velocity

4.The potential energy of a satellite of mass m and revolving at a height R equal to radius of earth is

-mgR

$-\frac{mgR}{2}$

$-\frac{mgR}{3}$

$-\frac{mgR}{4}$

5.If the temperature of sun were increases from T to 2T and its radius R to 2R then ratio of radiant energy received on earth to that it was previously will be

32

16

4

64

6.40g of ice at 0°C is mixed with 40g of water at 90°C then the temperature of mixture will be

0°C

5°C

10°C

15°C

7.A cylindrical tube open at both ends has fundamental frequency ‘f’ in air tube is dipped vertically in water so that one fourth of length of tube immersed in water, the fundamental frequency of air column will be

$\frac{f}{2}$

$\frac{2f}{3}$

$\frac{3f}{4}$

$\frac{f}{4}$

8.A source of sound is moving with uniform speed along the circumference of circle. The frequency of sound heard by listener at centre of circle is

Increases

Decreases

Remain same

Increases and decreases alternately

9.Two slits having width 1:25 then ratio of intensity at the maxima and minima in the interference pattern will be

121:49

49:121

4:9

9:4

10.An electron and a proton are placed in a uniform electric field. The ratio of their acceleration will be

1:1

0

$\frac{m_p}{m_e}$

$\frac{m_e}{m_p}$

11.When two charged metal ball are connected by a connecting wire the charge doesnot flow from one ball to another ball if

Charge are equal in both

Capacitance is equal

Potential is equal

Radius is equal

12.A wire of resistance 10Ω is stretched by one tenth of original length. The resistance will be

10Ω

12.1Ω

9Ω

11Ω

13.The cold junction of a thermocouple is maintained at 10°C. The emf become zero when hot junction is at 530°C. The neutral temperature is

260°C

265°C

270°C

520°C

14.A magnetic needle lying parallel to magnetic field requires W units of work to turn through 60°. The torque needed to maintain the needle in this position will be

$\sqrt{3}W$

W

$\frac{\sqrt{3}}{2}W$

2W

15.A glass prism is dipped in water then dispersive power of it

Increases

Decreases

Does not change

May increase or decrease

16.Work function for photo electric effect

Different for different metal

Same for all metal

Depends on intensity of radiation

Depends on frequency of radiation

17.The current gain of transistor is 60 & load resistance is 5000 Ω. The input resistance is 500 Ω then voltage gain will be

60

50

600

6000

18.If A and B are two matrices and $(A+B).(A–B) = A^2–B^2$ then

AB = BA

$A^2 + B^2 = A^2–B^2$

A'B' = AB

$(AB)^2 = A^2B^2$

19.If (4 + 3i) (x + iy) = (3 – 4i) then the value of $x^2 + y^2$ is

25

1

5

-1

20.If $\lim_{x\to 0} \frac{sin4x}{tanax}$ = 5 then the value of a is

$\frac{5}{4}$

$\frac{4}{5}$

1

-5

21.If a, b, c are in A.P. then $3^a, 3^b, \ 3^c$ are in

A.P.

H.P.

G.P.

A.G.P.

22. $\int_{-11}^{11} sin^7 x cos^5 x dx$ equals

0

1

2

$\frac{1}{2}$

23.The vertex of the parabola $y^2 + 2y + x = 0$ lies in …. quardant.

First

Second

Third

Fourth

24.If a, b ⊠ R and b > a > 0 then

a – b > 0

$\frac{1}{a} - \frac{1}{b} < 0$

ab < 0

$\frac{1}{a} - \frac{1}{b} > 0$

25.If $(1+x)^n = C_0 + C_1 x + C_2 x^2 + ... + C_n x^n$ then the value of $C_0 + 2C_1 + 2^2.C_2 + ... + 2^n C_n$ is

2^n

3^n

4^n

5^n

26.If the line lx + my + n = 0 is a normal to the circle $x^2 + y^2 = a^2$ then

l = 0

m=0

n=0

l+m=0

27.The length of the latus rectum of the ellipse $9x^2 + 25y^2 = 225$ is

$\frac{2}{9}$

$\frac{3}{5}$

$\frac{3}{8}$

$\frac{18}{5}$

28.A vector perpendicular to both $\vec{a}$ and $\vec{b}$ is

$\vec{a} + \vec{b}$

$\vec{a} . \vec{b}$

$\vec{a} \times \vec{b}$

$\vec{a} - \vec{b}$

29.In ΔABC, the value of $\frac{cosC+cosA}{c+a} + \frac{cosB}{b}$ is

$\frac{1}{a}$

$\frac{1}{b}$

$\frac{1}{c}$

$\frac{c+a}{b}$

30.The minimum value of the function |2x – 4| is at point x =

0

2

-2

4

31.The general solution of $3cosec^2 x – 4 = 0$ is

$n\pi + (-1)^n \frac{\pi}{3}$

$n\pi + \frac{\pi}{3}$

$n\pi \pm \frac{\pi}{3}$

$2n\pi \pm \frac{\pi}{3}$

32.If $sin^{-1}x + sin^{-1}y = \frac{2\pi}{3}$ then the value of $cos^{-1}x + cos^{-1}y$ is

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

$\frac{\pi}{3}$

$\frac{\pi}{2}$

$\frac{\pi}{6}$

33.The circumcenter of a right angled Δ with vertices A(0, 0), B(3, 0) and C(0, 4) is

(3, 4)

(0, 0)

$(\frac{3}{2}, 2)$

(3, 2)

34.If α, β, γ are the angles made by the line with the coordinate axes then the value of $sin^2\alpha$ + $sin^2\beta$ + $sin^2\gamma$ is

2

3

1

0

35.The equation of $x = \frac{e^t+e^{-t}}{2}$, $y = \frac{e^t-e^{-t}}{2}$, t R is

$x^2 + y^2 = 1$

$y^2 = 4x$

$x^2 - y^2 = 1$

$2x^2 + y^2 = 4$

36.The value of k for which the equation $2x^2-(5+k)x+8 = 0$ has roots numerically equal but opposite in sign is

5

-5

4

-4

37.H.C.F. of n!, (n + 1)! and (n + 2)! is

n!

(n+2)!

(n+1)!

(n-1)!

38.The number of Carbon atoms present in 112 ml of CO gas at STP is

3.01×10^{21}

6.023×10^{21}

3.01×10^{22}

6.023×10^{22}

39.The volume of water required to dilute 200 ml of 0.12 N NaOH to exactly decinormal NaOH is

30 ml

35 ml

40 ml

45 ml

40.The number of electrons present in 1 gram of Helium is

$0.25N_A$

$0.5N_A$

$0.75N_A$

N_A

41.Which of these pair represents conjugate acid and base?

$CH_4, {CH_3}^+$

H_3O^+, OH^-

CH_3OH, CH_3O^-

H_2, H^+

42.Volume of 4.4gm of CO_2 at STP is

2.24 L

22.4 L

4.48 L

44.8 L

43.The salt which is least likely to be found in mineral is

chloride

sulphide

nitrate

sulphate

44.In Nessler's reagent, the ion present is

Hg^{+}

Hg^{++}

HgI^{2-}

$HgI_4{}^{2-}$

45.Which of the following turns lead acetate paper black?

SO_2

H_2S

SO_3

H_2SO_4

46.On heating a mixture of NH_4Cl and KNO_2, we get

NH_4NO_3

N_2

$K[NH_4(NO_3)_2]$

NO

47.Electrometallurgy is employed for the extraction of

Cu

Fe

Na

Ag

48.Cyclohexane is

aliphatic compound

alicyclic compound

aromatic compound

heterocyclic compound

49.Phonemic transcription of 'king' is

$/king/$

$/ki/$

$/kig/$

$/kin/$

50.How many syllables are there in ‘admission’?

1

2

3

4

51.The antonym of ‘laugh’ is

grin

cry

smile

chuckle

52.Which word has a suffix?

Decry

Enrich

Chlorinate

Unsafe

53.The correct passive of ‘I know you’ is

you are known

you are known by me

you are known to me

known you are

54.Which sentence has a present participle?

I can’t stand you.

I can’t stand being with you.

I am writing nothing.

I am good at writing.

55.Which sentence has a phrasal verb?

I switched on the light.

I looked at the flower.

He cried.

He was crying yesterday.

56.Which one is plural?

data

datum

news

new

57.The pattern of: she looks beautiful to me'

$S + V_t + O + O$

$S + V_i + S_c + O$

$S + V_i + S_c + Adverbial$

$S + V_t + S_c + Adverbial$

58.Climb ….. the stairs into basement.

down

up

into

across

59.Which one is noun?

widen

with

admission

admit

60……. earlier, ……. better.

a, a

the, the

the, a

a, the

61.A ball is dropped. After 1 second another ball is dropped from same point. The distance between them after 3 second of 1^{st} ball is

25 m

20 m

50 m

10 m

62.A ball is projected as such an angle that the horizontal range is 3 times the maximum height. The angle of projection of ball is

$sin^{-1}(\frac{3}{4})$

$sin^{-1}(\frac{4}{3})$

$cos^{-1}(\frac{4}{3})$

$tan^{-1}(\frac{4}{3})$

63.Two pieces of metal are suspended from arms of balance and are found to be in equilibrium when kept immersed in water. The mass of one piece is 32g and its density is 8g/cc then density of other is 5 g/cc then mass will be

28g

35g

21g

33.6g

64.A Carnot heat engine work with ideal monoatomic gas has adiabatic compression ratio 2. The efficiency is

49%

42%

37%

26%

65.A layer of ice is formed on the surface of pond in atmosphere of –10°C. The time in which a layer of 1 cm is formed is 7 hrs then time in which this layer grow from 1 cm to 2 cm is

7 hrs

14 hrs

21 hrs

35 hrs

66.A tuning fork of 256 Hz is in resonance with 0.4 m length of wire when an iron of mass 2 kg is attached to its end. The length of wire to resonance if the load is immersed in water is (density of metal is 8g/cc)

0.37 m

0.43 m

0.31 m

0.2 m

67.A parallel plate capacitor with air between two plates has capacitance $9\mu F$. If the space between capacitor is filled by dielectric of dielectric constant 3 with thickness $\frac{d}{3}$ and another dielectric of dielectric constant 6 with space $\frac{2d}{3}$ then capacitance is

$1.8\mu F$

$45\mu F$

$40.5\mu F$

$20.3\mu F$

68.A voltmeter of resistance 100 Ω can measure a Pd of 25 V. The resistance required in series to read a voltage of 250 V is

100 Ω

200 Ω

600 Ω

900 Ω

69.A circular coil of 50 turns and area $1.25 \times 10^{-3} m^2$ is pivoted a vertical diameter in a uniform magnetic field carries current 2A. When plane of coil is N – S direction then torque act is 0.04 Nm & plane is EW direction then torque is 0.03 Nm. The magnetic flux is

0.2 T

0.3 T

0.4 T

0.5 T

70.The magnetic flux in a closed circuit of 10 Ω varies with time by $\phi = (6t^2 - 5t + 1)$ then current when t = 0.25 sec is

0.2 A

0.6 A

1.2 A

0.8 A

71.A person of normal range 25 cm to infinity use spectacle of +4D then range of vision while wearing spectacle is

12.5 cm to 20 cm

12.5 cm to 25 cm

12.5 cm to ∞

25 cm to 25 cm

72.In Young's expt the distance between two slits is $\frac{d}{3}$ and distance between slit & screen is 3D. The no of fringes in $\frac{1}{3}$m on screen formed by monochromatic light of wavelength 3λ is

$\frac{d}{9D\lambda}$

$\frac{d}{27D\lambda}$

$\frac{d}{81D\lambda}$

$\frac{d}{D\lambda}$

73.The longest wavelength emitted by hydrogen atom when a photon of wavelength 975 Å fall on it is

18787 Å

11220 Å

975 Å

640 Å

74.A mixture consist two radioactive material A_1 & A_2 with half lives 20s & 10s respectively. Initially A_1 has 40g and A_2 has 160g. The amount of two in mixture will be equal after

60 s

80 s

20 s

40 s

75.If $\int \frac{1}{x+x^5}$ dx = f(x) + c then $\int \frac{x^4}{x+x^5}$dx equals

$(x + x^5) + f(x) + c$

$f(x)–log_e x + c$

$f(x) + log_e x + c$

$log_e x–f(x) + c$

76.If $y = c_1 e^{nx} + c_2 e^{-nx}$ then $\frac{d^2y}{dx^2}$ equals

ny

-ny

$n^2 y$

$-n^2 y$

77.If $sin^{-1}x + sin^{-1}y + sin^{-1}z = \pi$ then the value of $x\sqrt{1–y^2} + y\sqrt{1–x^2}$ is

x

2xyz

y

z

78.The angles of a triangle are in A.P. and the sides are in GP. Then a^2, b^2, c^2 are

in A.P.

in G.P.

in H.P.

in A.G.P.

79.If $z = (k + 3) + i\sqrt{5–k^2}$ then the locus of z is

Ellipse

Parabola

Circle

Straight line

80.If the roots of the equation $x^2 + px + q = 0$ and $x^2 + qx + p = 0$ differ by the same constant then value of p + q is

2

4

-2

-4

81.If $x = a + \frac{a}{r} + \frac{a}{r^2} + ...$ to ∞, $y = b - \frac{b}{r} + \frac{b^2}{r^2} - ....$to ∞, $z = c + \frac{c}{r^2} + \frac{c}{r^4} + ...$ to ∞ then

$\frac{xy}{z} = \frac{c}{ab}$

$\frac{xy}{z} = \frac{ab}{c}$

$\frac{xy}{z} = \frac{ac}{b}$

$\frac{xy}{z} = \frac{bc}{a}$

82.The domains and range of the function $y = \frac{1}{3 - cos2x}$ is

R, [-1, 1]

R, [0, 1]

R, $[-\frac{1}{2}, \frac{1}{4}]$

R, $[\frac{1}{4}, \frac{1}{2}]$

83.If $\vec{a}, \vec{b}, \vec{c}$ are any three unit vectors with $\vec{a} + \vec{b} + \vec{c} = 0$ then the angle between the vectors $\vec{a}$ and $\vec{b}$ is

30°

60°

120°

135°

84.If $y = x - \frac{x^2}{2} + \frac{x^3}{3} - \frac{x^4}{4} + ...$ to ∞ , then the value of $\frac{y}{1!} + \frac{y^2}{2!} + \frac{y^3}{3!} + ...$ to ∞ is

$\log_e x + 1$

$\log_e y - 1$

x

$e^y + 1$

85.If the equation $x^2 + y^2 + 2gx + 2fy + 1 = 0$ represents a pair of lines then

$g^2 + f^2 = 1$

$g^2 - f^2 = 3$

$f^2 - g^2 = 2$

$f^2 + g^2 = 4$

86.If a circle touches y-axis and cuts off an intercept of length 2l from x-axis then the locus of the centre is

$x^2 + y^2 = l^2$

$x^2 – y^2 = l^2$

$y^2 – x^2 = l^2$

$x^2 + y^2 + l^2 = 0$

87.The distance between the parallel planes 2x – 2y + z + 1 = 0 and 4x – 4y + 2z + 3 = 0 is

$\frac{2}{3} units$

$\frac{1}{3} units$

$\frac{1}{6} units$

$\frac{1}{2} units$

88.The area bounded by the curves y = x and $y = x^3$ lying in the third quadrant is

1 sq. units

$\frac{1}{4}$ sq. units

$\frac{1}{6}$ sq. units

$\frac{1}{2}$ sq. units

89.If the volume of a cube is increasing at a constant rate then the rate of increase of surface area varies

directly as the volume

directly as the length

inversely as the length

inversely as the volume

90.An alkene “X” on ozonolysis gave acetone and acetaldehyde. The product formed by reacting X with HBr in presence of peroxide is

2-bromo-2-methyl butane

2-bromo-3-methyl butane

2-bromo-2-methyl propane

2-bromo pentane

91.2 gram of silver were deposited by passing 1A current through $AgNO_3$ solution for 35 minutes. The efficiency of the current is

78%

81%

85%

91%

92.3.55 grams of hydrated metal carbonate M2CO3. xH2O was dissolved in 100cc of solution. 10 cc of the solution required 8cc of 0.625 N alkali for neutralization. The value of x is (At. wt. of M = 23).

2

5

7

10

93.The k_{sp} of CaF_2 is 3.95×10^{11}. The concentration of F^- ion in saturated solution of CaF_2 is

2.14×10^{-4} mols/litre

6.28×10^{-6} mols/litre

4.24×10^{-4} mols/litre

1.25×10^{-5} mols/litre

94.A product formed by roasting of iron pyrite can act as

oxidant

reductant

bleachant

all of these

95.The pH of of a solution formed by adding 0.1 M KOH to 100 ml of 0.1 M HCl solution till acid is $\frac{3}{4}$ in neutralized.

1.84

0.84

2.18

1.18

96.The gas obtained by treating iodoform with silver powder is passed through hot tube then one of the following gas is obtained

toluene

benzene

acetylene

naphthalene

97.Read the following passage and answer the questions: In 1920 after some thirty-nine years of problems with disease, high costs, politics the panama canal was officially opened, finally linking the Atlantic and the Pacific Oceans by allowing ships to pass through. The fifty-mile canal zone instead of traveling some seven thousands miles around cape horn. It takes a ship approximately eight hours to complete the trip through the canal and costs an average of fifteen thousand dollars, one tenth of what it would cost an average ship to round the horn. More than fifteen thousand ships pass through its locks every year. The French initiated the project but sold their rights to the United States, which actually began the construction of the project. The latter will control it until the end of 2010 when Panama takes over its duties.