2022-01-01

1.A simple pendulum swings with an amplitude A and period T. Assuming at t = 0, bob is at extreme position. Then the time taken by bob to displace through half its amplitude from mean position is

$\frac{T}{6}$

$\frac{T}{2}$

$\frac{T}{4}$

$\frac{T}{3}$

2.The limiting force of friction between two bodies in contact is in dependent of

nature of surfaces in contact

area of surface in contact

normal reaction between surfaces

material of bodies

3.Metallic bar is heated from 0° to 100°C. The coefficient of linear expansion is 10^{-5}/K, then % increase in length will be

0.01%

0.1%

1%

10%

4.An ideal gas at pressure P is comprened suddenly then the density of gas becomes n times the initial value. The final pressure of gas will be

$n^{\gamma}P$

$n^{-\gamma}P$

$n^{\gamma-1}P$

$n^{1-\gamma}P$

5.Boiling water is changed into steam. Under this condition the specific heat of water is

zero

one

infinite

less than 1

6.Sound wave do not show phenomenon of

interference

diffraction

refraction

polarization

7.When a monochromatic light travels from vacuum to a medium of refractive index μ, then

frequency decreases and wavelength increases

frequency increases and wavelength decreases

wavelength increases

wavelength decreases

8.A wave is travelling in medium. The minimum distance between two particles always having same velocity is

$\frac{\lambda}{2}$

$\frac{\lambda}{4}$

λ

2λ

9.Electric flux through a cube of side l is ϕ. The flux through cube of side 2l and charge enclosed is made half is

$\frac{\phi}{2}$

2ϕ

4ϕ

ϕ

10.An ammeter and a voltmeter are joined in series to a cell. Their readings are A and V respectively. If a resistance is now joined in parallel with voltmeter

both A and V will increase

both A and V will decrease

A will decrease, V will increase

A will increase, V will decrease

11.A cable that can support a load W is is cut into two equal parts. The maximum load that can be supported by each part is

$\frac{W}{4}$

$\frac{W}{2}$

W

2W

12.Which is not electromagnetic radiations?

γ -rays

light

cosmic rays

infrared rays

13.When the temperature of semiconductor increases, the resistance

increases

decreases

remains same

can not be predictor

14.The slope of frequency of incident light and stopping potential for given surface will be

h

$\frac{h}{e}$

eh

e

15.If a diamond is dipped in water then its sparkle is

more than in air

less than in air

unchanged

none of the above

16.Energy levels A, B, C of a certain atom correspond to increasing values of energy, ie $E_A < E_B < E_C$. If λ_1, λ_2, and λ_3 corresponds to transition from C to B, B to A and C to A respectively then

$\lambda_3 = \lambda_1 + \lambda_2$

$\frac{1}{\lambda_3} = \frac{1}{\lambda_1} + \frac{1}{\lambda_2}$

$\lambda_1 + \lambda_2 + \lambda_3 = 0$

$\lambda_3^{\,2} = \lambda_1^{\,2} + \lambda_2^{\,2}$

17.A mass M is broken into two parts in which ‘m’ is one part then maximum gravitational force of attraction between two parts will be if m is

$\frac{M}{4}$

$\frac{M}{2}$

$\frac{M}{6}$

$\frac{M}{8}$

18.The outermost configuration of most electronegative element is

ns^2np^5

ns^2np^6

ns^2np^4

ns^2np^3

19.Isoelectronic species pair of CO is

N_2

O_2^{++}

Si

all

20.Number of orbital in M shell is

6

9

12

18

21.Oxidation no. of Fe is +1 in

$[Fe(CO)_5]$

Fe_3O_4

$[Fe(H_2O)_5NO]$

$[Fe(CN)_6]^{3-}$

22.The no. of water molecule in 1ml water is

2.12×10^{20}

3.06×10^{15}

3.34×10^{22}

4×10^{6}

23.When sulphur dioxide is bubbled through water, the solution will contain

sulphurous acid

sulphuric acid

hyposulphuric acid

persulphuric acid

24.The hydrocarbon formed by electrolysis of potassium fumarate is

ethane

ethyne

ethene

methane

25.Which of these alkyne doesn't give Tollen's test?

propyne

1-butyne

2-butyne

ethyne

26.On addition of HBr to propene in the absence of peroxides the first step involves the addition of

H^+

Br^-

H

Br

27.If metal contains its own oxide as impurity, it is refined by

poling

zone refining

distillation

Mond’s process

28.Which of the following is the ore of zinc?

Galena

Franklinite

Siderite

Malachite

29.The function $f(x) = \frac{sin^4x+cos^4x}{x+tanx}$ is

even function

odd function

polynomial function

none of these

30.If n(U) = 125, n(A) = 80, n(B) = 65 then greatest value of n(A∩B) is

125

110

100

80

31.The function $y = e^x$ and $y = e^{-x}$ has

1 solution

2 solution

No solution

Infinite Solution

32.If $sin^2A + sin^2B = sin^2C$, the Δ is

acute angled

right angled

obtuse angled

none of these

33.If one root of equation $x^2 - ax + 1 = 0$ is α, then other root is

$\frac{1}{\alpha}$

$-\frac{1}{\alpha}$

$1 + \alpha$

$1 - \alpha$

34.The projection of vector $\vec{a}$ on $\vec{b}$ is given by

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

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

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

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

35.The area of Δ made by $xcos\alpha + ysin\alpha = p$ with coordinate axes is

$\frac{2p^2}{|sin2\alpha|}$

$\frac{p^2}{|sin2\alpha|}$

$\frac{p^2}{2}$

$\frac{p^2}{2|sin2\alpha|}$

36.In 3D geometry, $x^2 + 5x + 6 = 0$ represents

pair of planes parallel to x-axis

pair of planes parallel to yz-plane

pair of planes parallel to zx-plane

pair of planes parallel to xy-plane

37.The length of latus rectum of parabola whose vertex is at (0, –3a) and focus is at (0, –a) is

6a

4a

12a

8a

38.$\lim_{x \to \infty} \frac{x^{20}}{e^x}$ is equal to

20e

$\frac{1}{e}$

0

$\frac{20}{e}$

39.$\int_{-1}^{1} x|x|dx$

$\frac{1}{3}$

-$\frac{1}{3}$

$\frac{2}{3}$

0

40.$\int d(sin^{-1}x) =$

$\frac{1}{\sqrt{1-x^2}}$ + c

-$\frac{1}{\sqrt{1-x^2}}$ + c

$sin^{-1}x + c$

$cos^{-1}x + c$

41.$\frac{dy}{dx}$ at x = 0 for y = |x| is

0

1

undefined

none of these

42.Area of region bounded by, $y = \sqrt{4-x^2}$ and x axis is

4π

2π

3π

π

43.If $sin^{-1}x + sin^{-1}y = \frac{\pi}{3}$ then $cos^{-1}x + cos^{-1}y =$

-$\frac{\pi}{3}$

$\frac{\pi}{3}$

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

π

44.General solution of $sin^2x + cosec^2x = 2$ is

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

$n\pi + \frac{\pi}{2}$

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

$n\pi \pm \frac{\pi}{4}$

45.Length of portion intercepted between axes by 3x + 4y = 12 is

7

$\frac{3}{2}$

6

5

46.In the expansion of $(1+x)^{10}$, sum of coefficient of even power of x is

2^5

2^9

2^{10}

2^{20}

47.The parametric equations $x = a(t + \frac{1}{t})$ and $y = b(t - \frac{1}{t})$ represents

parabola

a circle

an ellipse

a hyperbola

48.$log_e e + \frac{log_e 3}{1!} + \frac{(log_e 3)^2}{2!} + \frac{(log_e 3)^3}{3!} + ...\infty$

4

3

5

6

49.The word ‘tomato’ has it’s primary stress on …….. syllabus.

1^{st}

4^{th}

3^{rd}

2^{nd}

50.The synonym of ‘debility’

aphasia

nausea

weakness

euphoria

51.Fighting independently with the disease

guerilla war

constrict

crippling

stooke like

52.It seems I appeared the SLC the other day but two years …….. already rolled by.

has

have

is

were

53.She says, “I can’t forgive you.” can be reported as:

She says she can’t forgive me.

She says that she could not forgive me.

She said she can’t forgive me.

She told that she can’t forgive me.

54.The passive of : She let me talk in the class is:

I am allowed to talk in the class.

I am let to talk in the class.

I was allowed to talk in class.

I was alloweded to talk in the class.

55.The issue of freedom information did not get a look ……..

in

at

off

onto

56.She …….. many books and she …….. this book last year.

has written, wrote

had written, has written

wrote, has written

has written, has written

57.You'd better …….. on your studies rather than …….. involved in unproductive gossip.

focused, getting

focus, getting

to focus, get

focus, get

58.I need some …….. children.

five-year's-old

five-years-old

five-years-olds

five-year-old

59…….. and …….. should go together as she is waiting for …….. and …….. .

You, I, I, you

I, you, you, me

You, I, you, me

I, you, me, you

60.If she …….. us, we …….. easily …….. exam.

will guide, can, pass

would, could have, passed

guides, can, pass

guides, could, passed

61.If a particle thrown vertically upward then it cover same distance in 5^{th} & 6^{th} second so velocity of projection is

40 m/s

15 m/s

50 m/s

60 m/s

62.A solid sphere of mass 2 kg rolls on a smooth horizontal surface at 10 m/s it then rolls up a smooth inclined plane of inclined angle 30° with horizontal. The height attained by sphere before it stops is

10 m

8 m

7 m

5 m

63.A satellite is revolving around the earth in same sense as earth in orbit above the equator. Its period of revolution is 3hrs. If it is above point 'P' on the equator at some time, it will be again after time

$\frac{8}{3}hrs$

$\frac{24}{7}hrs$

21 hrs

27 hrs

64.Find amount of work done to increase the temperature of one mole of an ideal gas by 30°C if it is expanding under conduction $V \propto T^{\frac{2}{3}}$.

166.2 J

136.2 J

126.2 J

None of these

65.For a black body at temperature 727°C, its radiating power is 60W and temperature of surrounding is 227°C. If temperature of black body is changed to 1227°C then its radiating power will be

304 W

320 W

240 W

120 W

66.Coefficient of linear expansion of crystal in one direction is α_1 and that in every direction perpendicular to it is α_2. The coefficient of cubical expansion is

$\alpha_1 + \alpha_2$

$2\alpha_1 + \alpha_2$

$\alpha_1 + 2\alpha_2$

None of these

67.Microwaves from a transmitter are directed normally towards a plane reflector. A detector moves along the normal to the reflector. Between position of 14 successive maxima the detector travels a distance of 0.14 m. The frequency of transmitter is

1.5×10^{10} Hz

10^{10} Hz

3×10^{10} Hz

6×10^{10} Hz

68.A plane mirror is placed along positive x-axis. The equation of linear object is x = y. The equation of it's image is

x = y

x + y = 0

2x + y = 0

none of these

69.The slit separation on Young's double slit experiment is d and screen is D from source. The maxima is just opposite of each slit, the order of fringe is

$\frac{d^2}{2\lambda D}$

$\frac{2d^2}{\lambda D}$

$\frac{d^2}{\lambda D}$

$\frac{d^2}{4\lambda D}$

70.The electric potential at a point (x, y, z) is given by $v = -x^2y - xz^3 + 4$. The electric field $\vec{E}$ at that point is

$\vec{E} = \hat{i}2xy + \hat{j}(x^2 + y^2) + \hat{k}(3xz - y^2)$

$\vec{E} = \hat{i}z^3 + \hat{y}xyz + \hat{k}z^2$

$\vec{E} = \hat{i}(2xy - z^3) + \hat{j}xy^2 + \hat{k}3z^2x$

$\vec{E} = \hat{i}(2xy + z^3) + \hat{j}x^2 + \hat{k}3xz^2$

71.Two parallel wires P and Q are held perpendicular to the plane of paper at a distance 5m between them. If P carry current of 2.5A and Q carry current of 5A in same direction then magnetic field at a point halfway between the wires is

$\frac{N_0}{17}$

$\frac{\sqrt{3}N_0}{2\pi}$

$\frac{N_0}{2\pi}$

$\frac{3N_0}{2\pi}$

72.The flux (in weber) in a closed circuit of a resistance 10Ω varies with time t(in seconds) according to equation, $\phi = 6t^2 – 5t + 1$. What is magnitude of induced current at t = 0.25 seconds.

1.2 A

0.8 A

0.6 A

0.2 A

73.The binding energies per nucleon are 5.3 MeV, 6.2 MeV, 7.4 MeV for the nuclei with mass numbers 3, 4 and 5 respectively. If one nucleus of mass number 3 combines with one nucleus of mass number 5 to give two nuclei of mass number 4, then

0.3 MeV energy is absorbed

0.3 MeV energy is released

28 MeV energy is absorbed

3.3 MeV energy is absorbed

74.Half life of radioactive element is 12.5 hour and its quantity is 256g. After how much time its quantity will remain 1g?

5 hrs

100 hrs

150 hrs

200 hrs

75.The time required to decompose 500ml of water completely by using 25A current is

59.5 hrs

29.75 hrs

120 hrs

50 hrs

76.The pH of a solution formed by mixing 200ml of a solution having pH value 3 & 300ml of solution having pH value 12 is

2.25

3.25

11.75

12.75

77.Chloroethane reacts with magnesium in dry ether to form X. When X is hydrolyzed, a carbon compound Y and Z are formed. Which of following is Y?

C_2H_4

C_2H_2

C_2H_6

C_6H_6

78.For the reaction $C(s) + CO_2(g) \equiv 2CO(g)$, the partial pressure of CO_2 & CO are 4 atm & 8 atm respectively, the K_p for the reaction is

16 atm

2 atm

5 atm

4 atm

79.Haemoglobin contains 0.33% of iron by weight. The molecular weight of Haemeoglobin is approximately 67200. The number of iron atoms (at. wt of Fe = 56) present in one molecule of Haemoglobin are

1

6

4

2

80.What would be mass of CO having same number of oxygen atom as 88 gm of CO_2?

56 gm

28 gm

84 gm

112 gm

81.What happens when a compound obtained by treating Sodium bisulphide with Sodium bisulphate is treated with HCl

colloidal sulphur is precipitated

SO_3 evolves out

Cl_2 evolves out

H_2SO_4 is obtained

82.$|\frac{(3+4i)(sin\theta+icos\theta)}{sin\theta-icos\theta}|$ =

1

7

$\frac{5}{2}$

5

83.Domain of function $f(x)=\frac{1}{\sqrt{|x|-x}}$ is

$(-\infty,\infty)$

$[0,\infty)$

$(-\infty,0)$

$(-\infty,0]$

84.The equation $125^x+45^x=2.27^x$ has

no solution

one solution

two solution

more than two solution

85.In a ΔABC, $\frac{cosA}{a}=\frac{cosB}{b}=\frac{cosC}{c}$, if a = 16, then the area of triangle is

$\frac{1}{24}$

$\frac{1}{8\sqrt{3}}$

$\frac{1}{8}$

$\frac{1}{24\sqrt{3}}$

86.If $tan^{-1}(2x) + tan^{-1}(3x) = \frac{\pi}{4}$, then x is equal to

-1

-2

1

2

87.If $(1 + x–2x^2)^6 = 1 + a_1x + a_2x^2 + ... + a_{12}x^{12}$, then $a_2 + a_4 + a_6 + ...a_{12} =$

32

11

31

None of these

88.$\int e^{tan^{-1}x}(\frac{1+x+x^2}{1+x^2})$

$e^x tanx + c$

$e^{tan^{-1}x}tan^{-1}x + c$

$e^{tan^{-1}x}.x + c$

$e^{tanx}.x + c$

89.Let a, b, c be in A.P. and |a| < 1, |b| < 1, |c| < 1. If $x = 1 + a + a^2.....$, $y = 1 + b + b^2 + ...$ $z = 1 + c + c^2 + ...$ then, x, y, z are in

A.P.

G.P.

H.P.

None

90.If $y = tan^{-1}(\frac{4x}{1+5x^2})$ + $tan^{-1}(\frac{3x+2}{3-2x})$ then $\frac{dy}{dx}$ =

$\frac{3}{1+9x^2}$

$\frac{5}{1+25x^2}$

$\frac{4}{1+16x^2}$

$\frac{2}{1+4x^2}$

91.Area between y = tanx, y = cotx, x axis between 0 ≤ x ≤ $\frac{\pi}{2}$ is

$2log\sqrt{2}$

log2

2log2

Both a and b

92.If $\vec{a}+\vec{b}$ is orthogonal to $\vec{b}$ and $\vec{a}+2\vec{b}$ is orthogonal to $\vec{a}$ then

$|\vec{a}|=\sqrt{2}|\vec{b}|$

$|\vec{a}|=2|\vec{b}|$

$|\vec{a}|=|\vec{b}|$

$|\vec{b}|=2|\vec{a}|$

93.The curve $y=(x^2–1)(x^2–5)$ is concave up in interval

R

R – [–1, 1)

|x| > 1

|x| ≥ 1

94.The focal chord of $y^2=16x$ is tangent to $(x–6)^2+y^2=2$, then possible value of slope of this chord are

1, –1

$-\frac{1}{2},2$

$-2,\frac{1}{2}$

$\frac{1}{2},2$

95.Length of y-intercept made by circle $x^2+y^2–8x+y–20=0$ is

7

8

9

12

96.Locus of centroid of Δ whose vertices are (acost, asint), (bsint, –bcost) and (1, 0) where t is parameter is

$(3x+1)^2+(3y)^2=a^2–b^2$

$(3x–1)^2 + (3y)^2 = a^2–b^2$

$(3x–1)^2 + (3y)^2 = a^2 + b^2$

$(3x + 1)^2 + (3y)^2 = a^2 + b^2$

97.Read the following passage and answer the questions: The simplest method of welding two pipes of metal together is known as pressure welding. The ends of the metal are heated to a white heat for iron the welding temperature should be about 1300˚C in s flame. A this temperature the metal becomes plastic. The ends are then pressed together, and the joint is smoothened off. Care must be taken to ensure the surfaces are weld. Moreover the heating of the iron to a high is formed on the heated surface. For this reason, heat, the flux metals, and the oxide particles are dissolved in it together with any others impurities which may be present. The metal surfaces are pressed together, and the flux is squeezed out from the centre of the weld.