2021-12-25

1.If the radius of earth were shrink by 1%, its mass remains the same, the acceleration due to gravity on the surface of earth would

decreases

increases

depends on initials size

remain unchanged

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

$\frac{W}{4}$

$\frac{W}{2}$

W

2W

3.Boiling water is changing into steam. Under this condition the specific heat of water is

zero

one

infinity

less than 1

4.A difference of temperature of 25°C is equivalent to a difference to

45°F

72°F

32°F

25°F

5.Air bubble inside water appear silvery white due to

reflection

refraction

dispersion

total internal reflection

6.Sound wave do not show the phenomenon of

Interference

Diffraction

Dispersion

Polarization

7.The heating element of an electric heater should be made with a material which should be

High specific resistance & high melting point

High specific resistance & low melting point

Low specific resistance & high melting point

Low specific resistance & low melting point

8.Equal charges are given to two surfaces of different radii. The potential will be

More on smaller surface

More on bigger surface

Equal on both the sphere

Dependent on nature of material of sphere

9.Wavelength of matter wave is independent of

Mass

Velocity

Momentum

Charge

10.When we apply reverse bias to a junction diode it

Increases the minority current carrier

Lower the potential barrier

Rises the potential barrier

Increases the majority current carrier

11.Doppler's effect is not observed when

Source and observer moves in mutually perpendicular direction

When source & observer moving parallel

When source & observer move along apposite direction

None

12.In myopia, image is formed

retina

infront of retina

behind the retina

cannot be formed

13.Two bulb 60W, 250W and 100W, 250V bulb are connected in series and supplied by 250V, which bulb will gives more brightness

60W, 250V

100W, 250V

both a & b

None

14.Material used in suspension wire of moving coil galvanometer is

steel

cupper

brass

bronze

15.In case of free fall, frequency of simple pendulum is

zero without oscillation

100

zero with oscillation

infinite

16.In horizontal circular motion, velocity of object is

Independent to radius of circle

Independent of length of string

Independent of inclination of string

Independent of acceleration due to gravity

17.The current gain (α) of a transistor is

$\frac{I_C}{I_E}$

$\frac{I_B}{I_C}$

$\frac{I_B}{I_E}$

$\frac{I_E}{I_C}$

18.The normality of 10 % (w/v) acetic acid is:

10 N

0.83 N

1.7 N

3.45 N

19.The presence of three unpaired electrons in nitrogen atom is explained by:

Heisenberg’s uncertainty principle

Aufbau’s rule

Pauli’s exclusion lain

Hund’s rule of maximum multiplicity

20.Inorganic benzene is:

BN

BF_4

B_2H_6

$B_3N_3H_6$

21.Ammonicalcuperouschloride absorbs:

CO_2

SO_2

H_2SO_4

CO

22.Smelling salt is:

$(NH_4)_2SO_4$

$(NH_4)_3SO_4$

NH_4Cl

$(NH_4)_2CO_3$

23.The salt solution used by barber as antiseptic is:

$K_2SO_4.Al_2(SO_4)_3.24H_2O$

$FeSO_4.(NH_4)_2SO_4.4H_2O$

$Na(NH_4)HPO_4.4H_2O$

$CaSO_4.2H_2O$

24.The hybridization of carbon in carbon monoxide is:

sp^3

sp^2

sp

dsp^2

25.Pick out the isoelectronic structures from the following: I. $CH_3{}^+$ II. H_3O^+ III. NH_3 IV. $CH_3{}^-$

I & II

I & IV

I & III

II, III & IV

26.Which of the following increases the acidity of acetic acid?

$-NO_2$

-CN

-F

All

27.Which of the following doesn't show -M effect?

-CN

$-NO_2$

$-NH_3{}^+$

-COOH

28.The aromatic compound doesn't have:

Cyclic structure

$4n + 2\pi e^{-}$

Conjugated system

sp^3 hybridization

29.The set $M = y : y \in R, y^2 = 16$ and set N = {y : 2y = 6} then find the (M ∩ N).

{2}

{4}

{3, 4}

ϕ

30.The difference of two irrational number is

is always a rational number

is always a real number

is always an irrational number

is a positive real number

31.The function $f(y) = sec[log(y^2 + \sqrt{1 + y^2})]$ is

odd

even

neither odd nor even

both “a” and “b”

32.Find the domain of the function $f(y) = \sqrt{\frac{(y+1)(y-3)(y-2)}{(y-2)}}$

[–2, –3)∪(–∞, ∞)

[–1, –2)∪(∞, 3)

[–1, 2)∪[3, ∞)

[–1, –2]∪[3, ∞]

33.If the sum of the first 10 terms of an AP is equal to sum of first 7 terms, then which of the following statements is true?

Sum of 12 terms is equal to the twice of sum of 5 terms.

Sum of 12 terms is equal to sum of 5 terms.

Sum of 12 terms is equal to thrice of sum of 5 terms.

None if the above.

34.The sum of three numbers in AP is 36 when the numbers are increased by 1, 4, 43 respectively, the resulting numbers are in GP. Find the numbers?

3, 12, 21

63, 12, 39

both a & b

3, 13, 21

35.If a, b, c be in AP, b, c, a in HP then c, a, b are in:

AP

GP

HP

None

36.There are 5 questions in each group A and B. in how many ways can a student answer 3 questions from group A and 2 from group B.

80

90

100

110

37.The number of terms whose value depends on a in the expansion of $(a^2 + \frac{1}{a^2} - 2)^n$ is

n

2n + 1

2n

n - 1

38.The coefficient of y^4 in the expansion of $\frac{(1-3y)^2}{(1-2y)}$ is

46

4

64

5

39.Find the value of $1 + \frac{3}{1!} + \frac{5}{2!} + \frac{7}{3!} + ... + \infty$

$\frac{1}{3e}$

3e

2e

e

40.The equation for quadratic expression having one root $(2+\sqrt{3})$ is

$x^2+4x+1=0$

$x^2-4x-1=0$

$x^2-4x+1=0$

$x^2+4x-1=0$

41.The root of the equation $x^{\frac{2}{3}}+x^{\frac{1}{3}}-2=0$ are

0, 2

1, 8

1, -8

None

42.The value of $\sqrt{i}+\sqrt{-i}=$

$\frac{1}{\sqrt{2}}$

$\sqrt{2}$

$\frac{1}{2}$

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

43.The value of $i^{107}+i^{112}+i^{122}+i^{117}$ is equal to

3

1

2

0

44.Find the $\begin{vmatrix} 1 & log_a b & log_a c \\ log_b a & 1 & log_b c \\ log_c a & log_c b & 1 \end{vmatrix}$

1

log(abc)

log(a+b+c)

0

45.Find the $\begin{vmatrix} 6i & -3i & 1 \\ 4 & 3i & -1 \\ 20 & 3 & i \end{vmatrix}$ = x + iy then

x = 0, y = 0

x = 0, y = 1

x = 1, y = 1

x = 0, y = -1

46.For what value of μ do the simultaneous equations 5x + 7y = 2, 15x + 21y = μ have no solution?

$\mu = 0$

$\mu \neq 6$

$\mu \neq 0$

$\mu = 6$

47.$lim_{x \to \infty} \frac{5x^2+7x+20}{6x^3+15x+22}$

0

1

-1

∞

48.If $f(k) = \frac{1-cos\beta k}{ksink}, k \neq 0$ and $f(0) = \frac{1}{2}$ if f(k) is continuous at k =0, then β =

1

-1

0

both a and b

49.The phonemic transcription of the word – 'convince' is …..

$/knvlns/$

$/knvlns/$

$/knvns/$

$/knvlns/$

50.The word – ‘convocation’ has its primary stress on the ….. syllable.

1^{st}

2^{nd}

3^{rd}

4^{th}

51.Diligent:

militant

lazy

shallow

dubious

52.Mitigate:

obviate

restrict

aggravate

lesson

53.Erotic:

lovely

attractive

sexual

sensuous

54.I am with you ….. what you say.

in

to

at

on

55.I parted ….. him at the college gate.

from

at

with

on

56.Why have you broken ….. with your friend?

of

off

into

in

57.It ….. the people who matter.

is

are

were

have been

58.He did nothing but ……. .

to play

play

plays

played

59.It is no good …. over the spilt milk.

cry

to cry

crying

to be cried

60.She will wash up before she …. to bed.

will go

goes

went

had gone

61.The sum of the magnitude of two vectors is 18 and magnitude of their resultant is 12. If the resultant is 12. If the resultant is perpendicular to one of the vectors, the what are the magnitude of the two vectors?

5, 13

6, 12

7, 11

8, 10

62.A sphere of solid material of relative density 9 has a concentric spherical cavity and just sink in water. If the radius of the sphere be R, then the radius of cavity r will be related to R as

$r^3 = \frac{8}{9}R^3$

$r^3 = \frac{2}{3}R^3$

$r^3 = \frac{\sqrt{8}}{3}R^3$

$r^3 = \sqrt{\frac{2}{3}}R^3$

63.A meterstick of mass 800 gm is pivoted at one end and displaced through an angle of 60°. The increase in potential energy is

2 J

4 J

20 J

0.2 J

64.The radius of the pore of capillary tube is r and the angle of contact of liquid is θ. When tube is dipped in the liquid and liquid ruses to top the radius of curvature of meniscus of liquid rising in the tube is

$rsin\theta$

$\frac{r}{sin\theta}$

$rcos\theta$

$\frac{r}{cos\theta}$

65.A slab consists of two parallel layer of two different material of same thickness and having thermal conductivities k_1 & k_2 the equivalent thermal conductivity of the slab is

$k_1 + k_2$

$\frac{2k_1k_2}{k_1+k_2}$

$\frac{k_1+k_2}{k_1k_2}$

k_1k_2

66.A set of 28 tuning forks is arranged in series of decreasing frequencies. Each forks gives 3 beats with succeeding one. The first fork is the octave of the last. Calculate the frequency of the first and that of 15^{th} funning fork.

162 Hz, 120 Hz

150 Hz, 75 Hz

225 Hz, 125 Hz

120 Hz, 162 Hz

67.A pino wire of diameter 0.9 mm is replaced by another wire of 0.93 mm then the percentage change in frequency of pino wire is

+3.0%

+3.2%

–3.0%

–3.2%

68.A deuteron and an α-particle are placed in an electric field. If they are accelerated by same p.d. the velocities gained by them will be

1 : 1

$1 : \sqrt{2}$

$\sqrt{2} : 1$

1 : 2

69.A 1kg piece of copper is drawn into a wire 1mm and 2mm thick. Compare the resistance of these wires

2 : 1

4 : 1

8 : 1

16 : 1

70.In the ideal double slits experiment when a glass plate $(\mu = 1.5)$ of thickness t is introduced in the path of one of the interfering beams (wavelength λ) the intensity at the position where the central maximum occurred previously remain unchanged. The maximum thickness of the plate is

2λ

$\frac{2\lambda}{3}$

$\frac{\lambda}{3}$

λ

71.Two bulb 100 W, 250 V and 200W, 250V are connected in series across 500 V line then

100W will be fused

200W will be fused

both will be fused

no bulb will be fused

72.Two circular coil of radius 20 cm and 40 cm are made of similar wires are connected in parallel. The ratio of magnetic field at their centre

4 : 1

1 : 4

2 : 1

1 : 2

73.A radio transmitter operates at frequency 1000 KHz and a power of 66W. Find the number of photon emitted per sec.

10^{27}

10^{28}

10^{29}

10^{30}

74.In x-ray tube electrons bombarding the target produce x-ray of minimum wavelength 1Å, what must be the energy of bombarding electrons

$1.2 \times 10^5 eV$

1.2 eV

1.2 MeV

$12.45 \times 10^3 eV$

75.The alkene that gives acetone and formaldehyde on ozonolysis is:

2-methylpropene

2-methylbutene

propene

2, 3-dimethylbut-2-ene

76.The IUPAC names of OHC-COOH and $C(CN)_4$ are :

1-Aldomethanoic acid and 2,2-Dicyanopropane-1,3-dinitrile

1-Carboxymethanal and 2,2-Dicyanopropane-1,3-dinitrile

Glyoxalic acid and tetracyano methane

2-Oxoethanoic acid and Methane-1, 1, 1, 1-tetracarbonitrile

77.The solubility product of AgCl is 4×10^{-10} at 298 K. The solubility of AgCl in 0.04 M $CaCl_2$ is:

6×10^{-10} M

5×10^{-8} M

6×10^{-9} M

5×10^{-9} M

78.The concentration of NaOH solution in % (w/v) if 30 ml of this can neutralize 10 ml 0.1 N N_2SO_4 solution is:

0.05

2

0.2

0.5

79.How many hydrogen ions are there in 100 ml of a 0.2 N H_2SO_4 solution?

1.2×10^{22}

1.2×10^{23}

0.6×10^{22}

1×10^{22}

80.The correct order of IE_1 in the following is:

Na < Mg < Al < Si

Na < Al < Mg < Si

Na > Al > Mg > Si

Na > Mg > Al > Si

81.Which of the following conditions is required to balance the following ionic equation $Cr_2O_7^{--} \rightarrow Cr^{+++}$

12 electrons in LHS

12 electrons in RHS

6 electrons in RHS

6 electrons in LHS

82.The derivative of log|x| is

$\frac{1}{|x|}$

$-\frac{1}{|x|}$

$\frac{1}{x}$

$-\frac{1}{x}$

83.Absolute maximum (greatest value) and the absolute minimum values (least value) of the function $f(y) = 2y^3 – 9y^2 + 12y + 20$ defined on an interval [–1, 5] is

105, –3

104, –2

103, –1

106, –4

84.$\int \frac{d\theta}{4-5sin^2\theta}$=

$log(\frac{2+tan\theta}{2-tan\theta}) + c$

$\frac{1}{4}log(\frac{1+tan\theta}{1-tan\theta}) + c$

$\frac{1}{4}log(\frac{2+tan\theta}{2-tan\theta}) + c$

$\frac{1}{4}log(\frac{2-tan\theta}{2+tan\theta}) + c$

85.Find the area bounded by axis of the co-ordinates, the curve $x^2 = 4a(y – 2a)$ and the ordinate at the point (h, k).

$\frac{h}{12a}(h^2 + 24a^2)$

$\frac{h}{12a}(h^2 - 24a^2)$

$\frac{h}{12}(h^2 + 24)$

$\frac{h}{12}(h^2 + a^2)$

86.The bisector of the acute angle between 3x + 4y = 11 and 12x – 5y = 2 is

3x + 11y = 17

11x + 3y = 17

3x – 11y = 17

11x – 3y = 17

87.The slope of two straight lines $ax^2 + 2hxy + by^2 = 0$ will be reciprocals to each other if

a + b

a = b

h = 0

a + b = 2h

88.The y- intercept made by the circle: $x^2 + y^2 – 8x + y – 20 = 0$ is

8

4

12

9

89.The equation of tangent to the parabola $y^2 = 4x$ and $x^2 = 3y$ is

x + 2y = 0

2y – x – 2 = 0

2y + x + 2 = 0

2y + x – 2 = 0

90.A line makes 45o angle with positive x – axis and makes equal angles with positive y, z axes respectively. The sum of the three angels which the line makes with positive x, y, z axes is

135o

120o

155o

165o

91.If $sin^{-l}(1 – x) = 2sin^{-l}x + \frac{\pi}{2}$, then

$x = 0, \frac{1}{2}$

$x = \frac{1}{2}$

x = 0

None

92.The general solution of sinx – 3sin2x + sin3x = cosx – 3cos2x + cos3x is:

$(4n + 1)\frac{\pi}{8}$

$(2n + 1)\frac{\pi}{8}$

$n\pi + \frac{\pi}{8}$

$\frac{n\pi}{2} + \frac{\pi}{8}(-1)^n$

93.The area of triangle having vertices is $\vec{i}$ – 2$\vec{j}$ + 3$\vec{k}$, –2$\vec{i}$ + 3$\vec{j}$ – $\vec{k}$, 4$\vec{i}$ – 7$\vec{j}$ + 7$\vec{k}$ is

39 sq. units

o sq-units

11 sq units

36 sq. units

94.The value of $(\vec{p}.\vec{i})\vec{i}$ + $(\vec{p}.\vec{j})\vec{j}$ + $(\vec{p}.\vec{k})\vec{k}$

0

$3\vec{p}$

$2\vec{p}$

$\vec{p}$

95.The value of $\frac{cos11°+sin11°}{cos11°-sin11°}$ is

tan 56o

tan 47o

tan 74o

tan 65o

96.If e and e' be eccentricities of a hyperbola and its conjugate then

$\frac{1}{e^2} - \frac{1}{(e')^2}$ = 1

$e^2 - (e')^2 = 1$

$\frac{1}{e^2} + \frac{1}{(e')^2}$ = 1

None

97.Read the following passage and answer the questions: I looked on anxiously at the clock: he was late, it was midnight and I was worried to death. What could I do? If I rang the police and then just he turned up on the doorstep I'd feel such a fool. I knew I had to pull myself together, so I put the kettle on and made myself a cup of strong black coffee to clam my nerves. Suddenly the door bell rang and somehow I knew that something dreadful had happened. I opened the door, "Mr. Smith? I'm Constable Jones. I'm afraid there has been an accident". I cannot remember anything about the next few hours; it was just like a nightmare. I just could not believe that it was happening to me. Everybody was very kind of course: they did what they could do to help and everyone said that time was a great healer. My neighbours were marvelous they could not do enough for me. But Rover, run over by a bus! Tears kept on rolling. No other dog would ever be the same.