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Section : Physics and Mathematics

Q.1 The tangent and normal at any point of the curve  $x = ae^\theta (\sin \theta - \cos \theta)$ ,  $y = ae^\theta (\sin \theta + \cos \theta)$  are

- Ans
- 1. at a difference of  $\frac{\pi}{2}$  from origin
  - 2. at a difference of  $\cos \theta$  from origin
  - 3. equidistant from the origin
  - 4. at a difference of  $\sin \theta$  from origin

Question ID : 826662153

Status : Answered

Chosen Option : 3

Q.2 The thickness of a soap film ( $n = 1.46$ ) is 300 nm. What wavelength of light in the visible region can be used to constructively reflect off the film?

- Ans
- 1. 620 nm
  - 2. 584 nm
  - 3. 628 nm
  - 4. 410 nm

Question ID : 826662129

Status : Answered

Chosen Option : 2

Q.3 The solution of the differential equation  $\frac{d^2y}{dx^2} - 3\frac{dy}{dx} + 2y = e^{3x}$  is given by

- Ans
- 1.  $y = c_1e^{-x} + c_2e^{-2x} + \frac{1}{2}e^{3x}$
  - 2.  $y = c_1e^x + c_2e^{2x} + \frac{1}{2}e^{3x}$
  - 3.  $y = c_1e^{-x} + c_2e^{2x} + \frac{1}{2}e^{3x}$
  - 4.  $y = c_1e^x + c_2e^{-2x} + \frac{1}{2}e^{3x}$

Question ID : 826662159

Status : Answered

Chosen Option : 2

Q.4 Solution of differential equation  $p = \sin(y - xp)$  is

- Ans
- 1.  $y = x + \sin^{-1} c$
  - 2.  $y = \frac{c}{x} + \sin^{-1} c$
  - 3.  $y = cx + \sin^{-1} c$

Question ID : 826662158

Status : Answered

Chosen Option : 3

4.  $y = cx + \sin c$

Q.5 Every open set of real numbers is the union of

Ans  1.

countable collection of disjoint open intervals

2.

uncountable collection of disjoint closed intervals

3.

countable collection of disjoint closed intervals

4.

uncountable collection of disjoint open intervals

Question ID : 826662161

Status : Answered

Chosen Option

Q.6 The value of  $\int \frac{dx}{(1+e^x)(1+e^{-x})}$  is equal to:

Ans

1.  $-\frac{1}{(1+e^{-x})} + c$

2.  $-\frac{1}{(1+e^x)} + c$

3.  $\frac{1}{(1+e^x)} + c$

4.  $\frac{1}{(1+e^{-x})} + c$

Question ID : 826662181

Status : Answered

Chosen Option

Q.7 The value of  $\int_{-1}^1 \int_0^{x+z} \int_0^{x+z} (x+y+z) dx dy dz$  is:

Ans  1. -1

2. 1

3. 0

4. 2

Question ID : 826662177

Status : Answered

Chosen Option :

Q.8 The electric field between the two plates of a parallel plate (area =  $5.0 \times 10^{-2} \text{ m}^2$ ) capacitor is given by  $E = (2.0 \times 10^5 - 4.0 \times 10^4 t) \text{ V/m}$ , where  $t$  is in seconds. What is the magnitude of the displacement current between the plates? ( $\epsilon_0 = 8.85 \times 10^{-12} \text{ F/m}$ )

Ans  1.  $8.46 \times 10^{-9} \text{ A}$

2.  $1.77 \times 10^{-8} \text{ A}$

3.  $5.95 \times 10^{-7} \text{ A}$

4.  $4.54 \times 10^{-6} \text{ A}$

Question ID : 826662143

Status : Answered

Chosen Option :

Q.9 The Curie temperature for cobalt is:

Ans  1. 1043 K

2. 627 K

3. 3862 K

4. 1388 K

Question ID : 826662148

Status : Answered

Chosen Option

Q.10 The asymptotes of the curve  $x^2y^2 = a^2(x^2 + y^2)$

- Ans
- 1. forms a square of side  $a/2$
  - 2. forms a square of side  $a$
  - 3. forms a square of side  $3a/2$
  - 4. forms a square of side  $2a$

Question ID : 826662155

Status : Answered

Chosen Option

Q.11 As soon as a new variable is found by iteration, it is used immediately in the linear equations, this method is called:

- Ans
- 1. Relaxation Method
  - 2. Gauss Seidal Method
  - 3. Gauss Jordan Method
  - 4. Jacobi Method

Question ID : 826662169

Status : Answered

Chosen Option

Q.12 The intensity of the central maxima in the diffraction pattern due to a double slit is  $n$  times that of the central maxima due to diffraction at a single slit. Here  $n$  is:

- Ans
- 1. 3
  - 2. 2
  - 3. 1
  - 4. 4

Question ID : 826662133

Status : Answered

Chosen Option

Q.13 A family of planes of spacing 0.2518 nm of NaCl crystal reflects a beam of X-ray in first order at an angle of  $30^\circ$ . The wavelength of X-rays is:

- Ans
- 1. 0.2518 nm
  - 2. 0.1259 nm
  - 3. 0.3778 nm
  - 4. 0.5036 nm

Question ID : 826662140

Status : Answered

Chosen Option

Q.14 The solution of  $xp + yq = z$  is

- Ans
- 1.  $f(x, y) = 0$
  - 2.  $f(x^2, y^2) = 0$
  - 3.  $f(xy, yz) = 0$
  - 4.  $f\left(\frac{x}{y}, \frac{y}{z}\right) = 0$

Question ID : 826662160

Status : Answered

Chosen Option

Q.15 A plane polarized electromagnetic wave is travelling in free space along +x direction. The amplitude of its electric field is  $E_0 = 240 \text{ N/C}$  and its frequency is 150 MHz. The magnetic field of the wave can be written as:

- Ans
- 1.  $B = \{(800 \text{ nT}) \sin [(3.14 \text{ rad/m}) x + (9.42 \times 10^8 \text{ rad/s}) t]\} \mathbf{k}$
  - 2.  $B = \{(800 \text{ nT}) \sin [(3.14 \text{ rad/m}) x - (9.42 \times 10^8 \text{ rad/s}) t]\} \mathbf{k}$
  - 3.  $B = \{(240 \text{ nT}) \sin [(2.09 \text{ rad/m}) x - (6.27 \times 10^8 \text{ rad/s}) t]\} \mathbf{k}$
  - 4.  $B = \{(240 \text{ nT}) \sin [(2.09 \text{ rad/m}) x + (6.27 \times 10^8 \text{ rad/s}) t]\} \mathbf{k}$

Question ID : 826662145

Status : Answered

Chosen Option

Q.16 Interference fringes are observed with a biprism of refracting angle  $2^\circ$  and refractive index 1.5 on a screen 100 cm away from it. If the distance between the source and the biprism is 20 cm and the fringe width is 0.10 mm, the wavelength of light used is:

- Ans
- 1. 5710 Å
  - 2. 5900 Å
  - 3. 5630 Å
  - 4. 5820 Å

Question ID : 826662131

Status : Answered

Chosen Option : 

Q.17 If  $u = \sin^{-1}(x/y) + \tan^{-1}(y/x)$  then  $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y}$  is equal to

- Ans
- 1.  $u/2$
  - 2.  $2u$
  - 3. Zero
  - 4.  $u$

Question ID : 826662154

Status : Answered

Chosen Option : 

Q.18 The value of  $\lim_{x \rightarrow \pi/2} \frac{\log \sin x}{(\pi/2 - x)^2}$  is

- Ans
- 1. 0
  - 2.  $1/2$
  - 3.  $-1/2$
  - 4.  $-2$

Question ID : 826662156

Status : Answered

Chosen Option : 

Q.19 A proton with rest mass of  $1.67 \times 10^{-27}$  kg moves in an accelerator with a speed of  $0.6c$ . Its total energy is ( $c = 3 \times 10^8$  m/s)

- Ans
- 1.  $1.88 \times 10^{-10}$  J
  - 2.  $5.46 \times 10^{-10}$  J
  - 3.  $0.92 \times 10^{-10}$  J
  - 4.  $3.42 \times 10^{-10}$  J

Question ID : 826662127

Status : Answered

Chosen Option : 

Q.20 Given  $-x + y = 0$   
 $-x - 2y + 3z = 0$   
 $2x + y - 3z = 0$

then:

- Ans
- 1.  $x = z, y = 0$
  - 2.  $y = z, x = 0$
  - 3.  $x = y, 0 = z$
  - 4.  $x = y = z$

Question ID : 826662167

Status : Answered

Chosen Option : 

Q.21 Considering four subintervals, the value of  $\int_0^1 \frac{1}{1+x} dx$  by Trapezoidal rule is:

- Ans
- 1. 0.6970
  - 2. 0.6870
  - 3. 0.6677
  - 4. 0.3597

Question ID : 826662170

Status : Answered

Chosen Option :



Q.22 The value of  $\int_C \frac{3z+1}{z(2z+1)} dz$ , where C is the circle  $|z|=1$  is:

Question ID : 826662175

Status : Answered

Chosen Option : 

- Ans
- 1. -4
  - 2.  $3\pi i$
  - 3. 4
  - 4.  $2\pi i$

Q.23 The time period of a pendulum is 2.0 s in a stationary inertial frame of reference. Its period measured by an observer moving at a speed of  $0.6c$  with respect to the inertial frame of reference will be:

Question ID : 826662125

Status : Answered

Chosen Option : 

- Ans
- 1. 1.6 s
  - 2. 3.3 s
  - 3. 1.2 s
  - 4. 2.5 s

Q.24  $\lim_{n \rightarrow \infty} \frac{1+2+3+\dots+n}{n^2}$  is equivalent to

Question ID : 826662162

Status : Answered

Chosen Option : 

- Ans
- 1. 0
  - 2.  $\infty$
  - 3. 1
  - 4.  $\frac{1}{2}$

Q.25 Light of wavelength  $5800 \text{ \AA}$  is incident normally on a slit of width  $0.20 \text{ mm}$ . Diffraction pattern is observed on screen  $2 \text{ m}$  away from the slit. From the central bright fringe, the distance of the first dark fringe on either side is

Question ID : 826662132

Status : Answered

Chosen Option : 

- Ans
- 1. 2.4 mm
  - 2. 5.8 mm
  - 3. 6.4 mm
  - 4. 1.2 mm

Q.26 The quantum mechanical model of the hydrogen atom requires that if the orbital quantum number is 4, the number of different permitted orbital magnetic quantum numbers will be:

Question ID : 826662151

Status : Answered

Chosen Option : 

- Ans
- 1. seven
  - 2. three
  - 3. nine
  - 4. four

Q.27 Frame  $S'$  moves relative to frame  $S$  at speed of  $2.4 \times 10^8 \text{ m/s}$  in the direction of increasing  $x$ . An object is fired in frame  $S'$  at a speed of  $1.8 \times 10^8 \text{ m/s}$  in the direction of increasing  $x'$ . The speed of the object according to an observer in frame  $S$  is

Question ID : 826662126

Status : Answered

Chosen Option : 

- Ans
- 1.  $1.2 \times 10^8 \text{ m/s}$
  - 2.  $2.0 \times 10^8 \text{ m/s}$
  - 3.  $2.8 \times 10^8 \text{ m/s}$
  - 4.  $1.6 \times 10^8 \text{ m/s}$

Q.28 If A and B are symmetric matrices, then AB are symmetric if:

Question ID : 826662165

Status : Answered

Chosen Option : 

- Ans
- 1.  $AB = BA$
  - 2.  $AB < BA$

3.  $AB > BA$

4.  $AB \neq BA$

Q.29 The only function among the following, that is analytic, is:

Ans  1.  $f(z) = \operatorname{Re}(z)$

2.  $f(z) = \bar{z}$

3.  $f(z) = \operatorname{Im}(z)$

4.  $f(z) = \sin(z)$

Question ID : 826662173

Status : Answered

Chosen Option

Q.30 The integrating factor of the differential equation

$$(y \log y)dx + (x - \log y)dy = 0 \text{ is}$$

Ans  1.  $1/y$

2.  $1/x$

3.  $-1/y$

4.  $-1/x$

Question ID : 826662157

Status : Answered

Chosen Option

Q.31 According to Einstein's prediction, which of the following happens to the time interval between two events occurring in an inertial frame of reference as the frame's velocity with respect to the observer increases?

Ans  1.

Interval becomes zero as velocity equals half the speed of light

2. Interval remains constant

3. Interval increases

4. Interval decreases

Question ID : 826662122

Status : Answered

Chosen Option

Q.32 The volume formed by revolution of loop of curve  $y^2(a+x) = x^2(3a-x)$  about the x axis is:

Ans  1. 0

2.  $\pi a^3(8 \log 2 - 3)$

3.  $\pi a^3(-8 \log 2 + 3)$

4.  $\pi a^3(8 \log 2 + 3)$

Question ID : 826662178

Status : Answered

Chosen Option

Q.33 The relativistic mass of a particle moving with a speed of  $2.0 \times 10^8$  m/s in an accelerator is found to be  $2.4 \times 10^{-26}$  kg. The rest mass of the particle is: ( $c = 3.0 \times 10^8$  m/s)

Ans  1.  $1.79 \times 10^{-26}$  kg

2.  $0.87 \times 10^{-26}$  kg

3.  $1.21 \times 10^{-26}$  kg

4.  $0.48 \times 10^{-26}$  kg

Question ID : 826662123

Status : Answered

Chosen Option

Q.34 The series  $\sum_{n=0}^{\infty} (2x)^n$  converges if:

Ans  1.  $-1 \leq x \leq 1$

2.  $-\frac{1}{2} \leq x \leq \frac{1}{2}$

Question ID : 826662164

Status : Answered

Chosen Option : 2

✓ 3.  $-\frac{1}{2} < x < \frac{1}{2}$

✗ 4.  $-2 < x < 2$

Q.35 For the function  $f(z) = \sin\left(\frac{1}{z}\right)$ ,  $z = 0$  is a:

Ans ✗ 1. removable singularity

✗ 2. simple pole

✗ 3. branch point

✓ 4. essential singularity

Question ID : 826662176

Status : Answered

Chosen Option ✗

Q.36 Two parallel plates (each of area  $200 \text{ cm}^2$ ) of a capacitor are given equal and opposite charges of magnitude  $1.78 \text{ } \mu\text{C}$ . The space between the plates is filled with a dielectric. If the electric field in the dielectric is  $1.5 \times 10^6 \text{ V/m}$ , what will be the magnitude of charge induced on each dielectric plate? ( $\epsilon_0 = 8.85 \times 10^{-12} \text{ F/m}$ )

Ans ✓ 1.  $1.51 \text{ } \mu\text{C}$

✗ 2.  $1.28 \text{ } \mu\text{C}$

✗ 3.  $0.52 \text{ } \mu\text{C}$

✗ 4.  $0.84 \text{ } \mu\text{C}$

Question ID : 826662146

Status : Answered

Chosen Option ✗

Q.37 Light of wavelength  $450 \text{ nm}$  is incident on a metal target (work function =  $1.8 \text{ eV}$ ) in a phototube. What is the value of stopping potential in this case? ( $h = 6.63 \times 10^{-34} \text{ J s}$ ,  $c = 3 \times 10^8 \text{ m/s}$ ,  $1 \text{ eV} = 1.6 \times 10^{-19} \text{ J}$ )

Ans ✗ 1.  $4.56 \text{ V}$

✓ 2.  $0.96 \text{ V}$

✗ 3.  $2.76 \text{ V}$

✗ 4.  $0.56 \text{ V}$

Question ID : 826662149

Status : Answered

Chosen Option ✗

Q.38 The length of a spaceship is measured to be exactly one-third its length at rest. The speed of the spaceship relative to the ground observer is:

Ans ✗ 1.  $0.487 c$

✓ 2.  $0.943 c$

✗ 3.  $0.764 c$

✗ 4.  $0.254 c$

Question ID : 826662124

Status : Answered

Chosen Option ➡

Q.39 X-rays of wavelength of  $0.4500 \text{ nm}$  undergo Compton scattering from free electrons in carbon. If photons are scattered at  $60^\circ$  relative to the incident rays, what percentage of initial X-ray photon energy is transferred to an electron in such a scattering?

Ans ✗ 1.  $0.56 \%$

✗ 2.  $1.2 \%$

✓ 3.  $0.27 \%$

✗ 4.  $0.81 \%$

Question ID : 826662142

Status : Answered

Chosen Option ➡

Q.40 In solving ordinary differential equation  $y' = 2x$ ,  $y(0) = 0$  using Euler's method, the iterates  $y_n, n \in N$  satisfy:

Ans ✗ 1.  $y_n = 2x_n$

✗ 2.  $y_n = x_n^2$

✓ 3.  $y_n = x_n x_{n-1}$

Question ID : 826662172

Status : Answered

Chosen Option : 2



4.  $y_n = x_n + x_{n-1}$

**Q.41** The minimum X-ray wavelength produced in a tube is  $13.5 \times 10^{-12}$  m. Through what potential electrons are accelerated in order to generate these rays?  
( $h = 6.63 \times 10^{-34}$  J s,  $c = 3 \times 10^8$  m/s,  $1 \text{ eV} = 1.6 \times 10^{-19}$  J)

- Ans  1. 46000 V  
 2. 75000 V  
 3. 33000 V  
 4. 92080 V

Question ID : 826662150

Status : Answered

Chosen Option : 

**Q.42** A satellite is powered by a small nuclear generator that puts out 15W. How much mass is converted into energy in 10 years lifespan of the generator?

- Ans  1. 15.6 g  
 2. 15.6 kg  
 3. 53 g  
 4. 53  $\mu$ g

Question ID : 826662128

Status : Answered

Chosen Option : 

**Q.43** The position of a particle is measured with an uncertainty of  $6.6 \times 10^{-10}$  m. What is the minimum uncertainty in any simultaneous measurement of the momentum of the particle? ( $h = 6.63 \times 10^{-34}$  J s)

- Ans  1.  $1.6 \times 10^{-25}$  kg m/s  
 2.  $3.2 \times 10^{-23}$  kg m/s  
 3.  $4.6 \times 10^{-24}$  kg m/s  
 4.  $5.8 \times 10^{-22}$  kg m/s

Question ID : 826662137

Status : Answered

Chosen Option : 

**Q.44** The value of integral  $\int_0^{\pi/2} \log(\tan x) dx$  is:

- Ans  1.  $\frac{\pi}{2} \log 2$   
 2.  $-\pi \log 2$   
 3.  $\pi \log 2$   
 4. 0

Question ID : 826662179

Status : Answered

Chosen Option : 

**Q.45** Let A be a matrix of order m X n and R is non-singular matrix of order n, then:

- Ans  1. Rank (RA)  $\leq$  Rank (A)  
 2. Rank (RA) = Rank (A)  
 3. Rank (RA)  $\geq$  Rank (A)  
 4. Rank (RA)  $\neq$  Rank (A)

Question ID : 826662166

Status : Answered

Chosen Option : 4

**Q.46** Light is incident normally on a diffraction grating having 5000 lines/cm. Second order line is observed at an angle of  $30^\circ$ . What is the wavelength of light?

- Ans  1. 6000  $\text{\AA}$   
 2. 5800  $\text{\AA}$   
 3. 4000  $\text{\AA}$   
 4. 5000  $\text{\AA}$

Question ID : 826662134

Status : Answered

Chosen Option : 2

Q.47 The blue light from the sky has been polarised by:

- Ans
- 1. reflection
  - 2. scattering
  - 3. selective absorption
  - 4. double refraction

Question ID : 826662136

Status : Answered

Chosen Option : 

Q.48 If vector space  $V$  have dimension  $\dim V = n$  and let  $B$  and  $B'$  are two basis of  $V$  then:

- Ans
- 1.  $B$  and  $B'$  have less than  $n$  elements
  - 2.  $B$  and  $B'$  have same number of elements  $n$
  - 3.  $B$  and  $B'$  will have distinct number of elements
  - 4.  $B$  and  $B'$  have more than  $n$  elements

Question ID : 826662168

Status : Answered

Chosen Option : 

Q.49 If  $f(x) = x^m \sin(1/x)$ ,  $x \neq 0$ ,  $f(0) = 0$  then the minimum value of  $m$  for which  $f$  is derivable at  $x=0$  and also  $\frac{df}{dx}$  is continuous at  $x=0$  is

- Ans
- 1.  $m=1$
  - 2.  $m=4$
  - 3.  $m=2$
  - 4.  $m=3$

Question ID : 826662152

Status : Answered

Chosen Option : 

Q.50 The points which represents the root of the equation  $(z+1)^n - z^n = 0$  lie on:

- Ans
- 1. a straight line
  - 2. a pair of straight lines
  - 3. a parabola
  - 4. a circle

Question ID : 826662174

Status : Answered

Chosen Option : 

Q.51 X-rays of wavelength of  $0.0650 \text{ nm}$  undergo Compton scattering from free electrons in a target. What is the wavelength of photons scattered at  $90^\circ$  relative to the incident rays? ( $h = 6.63 \times 10^{-34} \text{ J s}$ ,  $m_e = 9.11 \times 10^{-31} \text{ kg}$ ,  $c = 3 \times 10^8 \text{ m/s}$ )

- Ans
- 1.  $0.0687 \text{ nm}$
  - 2.  $0.0024 \text{ nm}$
  - 3.  $0.0674 \text{ nm}$
  - 4.  $0.0626 \text{ nm}$

Question ID : 826662141

Status : Answered

Chosen Option : 

Q.52 A  $20 \text{ cm}$  long tube containing  $15\%$  sugar solution rotates the plane of polarization of light by  $21^\circ$ . The specific rotation of sugar solution is:

- Ans
- 1.  $64^\circ$
  - 2.  $70^\circ$
  - 3.  $58^\circ$
  - 4.  $49^\circ$

Question ID : 826662135

Status : Answered

Chosen Option : 

Q.53 A proton ( $m = 1.67 \times 10^{-27} \text{ kg}$ ) is moving at a speed of  $6.0 \times 10^5 \text{ m/s}$ . What is its de Broglie wavelength?

- Ans
- 1.  $6.62 \times 10^{-13} \text{ m}$

Question ID : 826662138

Status : Answered

Chosen Option : 4

2.  $2.28 \times 10^{-13} \text{ m}$

3.  $8.93 \times 10^{-13} \text{ m}$

4.  $1.14 \times 10^{-13} \text{ m}$

**Q.54** If one root of the equation  $f(x) = 0$  is near to  $x_0$ , then the first approximation of this root as calculated by Newton Raphson method is the abscissa of the point, where the following straight line intersects the x-axis:

Ans  1.

the straight line through the point  $(x_0, y = f(x_0))$  having the gradient  $\frac{1}{f'(x_0)}$

2.

tangent to the curve  $y = f(x)$  at the point  $(x_0, y = f(x_0))$

3. Passing through the point  $(x_0, y = f(x_0))$

4.

normal to the curve  $y = f(x)$  at the point  $(x_0, y = f(x_0))$

Question ID : 826662171

Status : Answered

Chosen Option

**Q.55** In a Newton's rings experiment, light of wavelength  $\lambda$  and a lens of radius of curvature  $R$  are used. The radius of 5<sup>th</sup> bright ring is  $n$  times the radius of the 2nd bright ring. Then  $n$  is:

Ans  1.  $\sqrt{2}$

2.  $\sqrt{3}$

3.  $\sqrt{5}$

4.  $\sqrt{7}$

Question ID : 826662130

Status : Answered

Chosen Option

**Q.56** A necessary condition for a series  $\sum u_n$  to converge is that

Ans  1.  $u_n \rightarrow 0$  as  $n \rightarrow \infty$

2.  $u_n \rightarrow 2$  as  $n \rightarrow \infty$

3.  $u_n \rightarrow \infty$  as  $n \rightarrow \infty$

4.  $u_n \rightarrow 1$  as  $n \rightarrow \infty$

Question ID : 826662163

Status : Answered

Chosen Option

**Q.57** If  $I_n = \int_0^{\pi/4} \tan^n \theta d\theta$  then the following reduction formula exists:

Ans  1.  $I_n + I_{n-2} = \frac{1}{n+1}$

2.  $I_n + I_{n-2} + \frac{1}{n+1} = 0$

3.  $I_n - I_{n-2} = \frac{1}{n+1}$

4.  $I_n - I_{n-2} + \frac{1}{n+1} = 0$

Question ID : 826662180

Status : Answered

Chosen Option

**Q.58** A magnetic field of 3.6T is applied to a paramagnetic gas. The atoms of the gas have magnetic dipole moment of  $4.5 \times 10^{-23} \text{ J/T}$ . At what temperature, will the mean translational kinetic energy of an atom of the gas be equal to the energy required to change the alignment of atom's magnetic dipole from anti-parallel to parallel (to the magnetic field) (Boltzmann constant =  $1.38 \times 10^{-23} \text{ J/K}$ )?

Ans  1. 0.82 K

2. 1.74 K

3. 300 K

Question ID : 826662147

Status : Answered


Chosen Option

✓ 4. 15.7 K

**Q.59** The Poynting vector of an electromagnetic wave in vacuum is  $S = \{(120 \text{ W/m}^2) \sin^2 [(8.0 \text{ rad/m}) z + (2.4 \times 10^9 \text{ rad/s}) t]\} \mathbf{k}$ .  
What is the frequency of the wave?

Question ID : 826662144

Status : Answered


Chosen Option : 

- Ans**
- ✓ 1. 382 MHz
  - ✗ 2. 172 MHz
  - ✗ 3. 241 MHz
  - ✗ 4. 54.6 MHz

**Q.60** A ruby laser delivers a 10 ns pulse of 1 MW average power. If all the photons are of the same wavelength 694.3 nm, how many photons are contained in the pulse?

Question ID : 826662139

Status : Answered

Chosen Option : 

- Ans**
- ✓ 1.  $3.5 \times 10^{16}$
  - ✗ 2.  $6.2 \times 10^{16}$
  - ✗ 3.  $2.6 \times 10^{15}$
  - ✗ 4.  $4.0 \times 10^{14}$

Section : English Language

**Q.1** Select the word that is closest in meaning to the word in capitals.

BRIEF

Question ID : 826662182

Status : Answered


Chosen Option : 

- Ans**
- ✓ 1. Short
  - ✗ 2. Small
  - ✗ 3. Little
  - ✗ 4. Limited

**Q.2** Select the phrase that best expresses the meaning of the underlined idiom.  
I tried to be pleasant to her but she gave me the cold shoulder.

Question ID : 826662186

Status : Answered


Chosen Option : 

- Ans**
- ✓ 1. knocked me down
  - ✗ 2. insulted me
  - ✗ 3. ignored me
  - ✗ 4. slapped me

**Q.3** Select the phrase/clause that best completes the sentence.  
I stopped on my way \_\_\_\_\_ some money from the ATM.

Question ID : 826662200

Status : Answered

Chosen Option : 

- Ans**
- ✗ 1. for withdrawing
  - ✓ 2. to be withdrawing
  - ✗ 3. to withdraw
  - ✗ 4. withdrew

**Q.4** Select the word that is opposite in meaning to the word in capitals.

VANITY

Question ID : 826662183

Status : Answered

Chosen Option : 1

- Ans**
- ✗ 1. Generosity
  - ✗ 2. Hostility



3. Humility

4. Pride

**Q.5** Given below are four-sentence paragraphs (S1-S4). S1 and S4 are given. From the options (P, Q, R) choose two sentences which can be S2 and S3.

S1: Dodo bird is one of the first things we think of when we hear the word 'extinct.'

S2: \_\_\_\_\_

S3: \_\_\_\_\_

S4: This might have led to their early extinction.

P. This grey flightless bird belonged to the pigeon and the dove family.

Q. Dodo's lack of flight forced them to nest on ground.

R. Often stray dogs and wild pigs would trample on and eat Dodo eggs.

**Ans**  1. RQ

2. PR

3. PQ

4. QR

Question ID : 826662196

Status : Answered

Chosen Option :

**Q.6** Select the phrase/clause that could replace the underlined section.  
World War II proved to be the deadliest conflict in human history, claiming nearly twice as many lives than were killed in World War I.

**Ans**  1. than in World War I.

2. as in World War I.

3. as were killed in World War I.

4. than would have been killed in World War I.

Question ID : 826662201

Status : Answered

Chosen Option :

**Q.7** Given below are four-sentence paragraphs (S1-S4). S1 and S4 are given. From the options (P, Q, R) choose two sentences which can be S2 and S3.

S1: Joe stepped onto the aeroplane and was met by one of the cabin crew.

S2: \_\_\_\_\_

S3: \_\_\_\_\_

S4: Sitting next to him was an 8 year-old-boy who also appeared to be quite nervous.

P. This was his first flight and he was feeling quite nervous.

Q. He looked out of the window and saw the red golden sun.

R. He walked along the aisle of the plane and found his seat.

**Ans**  1. QR

2. QP

3. PQ

4. PR

Question ID : 826662195

Status : Answered

Chosen Option :

#### Linked Answer Question:

Given below is a passage with four blanks. For each blank, four alternatives are provided. Select one of them to fill each blank.

In the 1870s, William Herschel, a British official in India, began \_\_\_\_\_ (1) with fingerprints as a hobby. He realized that no two people had exactly \_\_\_\_\_ (2) fingerprint and this fact \_\_\_\_\_ (3) used for identification. In 1901, Edward Henry \_\_\_\_\_ (4) fingerprints records for all the criminals serving a sentence of more than one month's imprisonment.

SubQuestion No : 8

**Q.8** Read the passage and fill in the blanks of (4) by choosing the best option.

**Ans**  1. built up

2. set up

3. lined up

Question ID : 826662192

Status : Answered

Chosen Option :

4. took up

Linked Answer Question:

Given below is a passage with four blanks. For each blank, four alternatives are provided. Select one of them to fill each blank.

In the 1870s, William Herschel, a British official in India, began \_\_\_\_\_ (1) with fingerprints as a hobby. He realized that no two people had exactly \_\_\_\_\_ (2) fingerprint and this fact \_\_\_\_\_ (3) used for identification. In 1901, Edward Henry \_\_\_\_\_ (4) fingerprints records for all the criminals serving a sentence of more than one month's imprisonment.

SubQuestion No : 9

Q.9 Read the passage and fill in the blanks of (2) by choosing the best option.

- Ans  1. identical  
 2. similar  
 3. alike  
 4. uniform

Question ID : 826662190

Status : Answered

Chosen Option :

Linked Answer Question:

Given below is a passage with four blanks. For each blank, four alternatives are provided. Select one of them to fill each blank.

In the 1870s, William Herschel, a British official in India, began \_\_\_\_\_ (1) with fingerprints as a hobby. He realized that no two people had exactly \_\_\_\_\_ (2) fingerprint and this fact \_\_\_\_\_ (3) used for identification. In 1901, Edward Henry \_\_\_\_\_ (4) fingerprints records for all the criminals serving a sentence of more than one month's imprisonment.

SubQuestion No : 10

Q.10 Read the passage and fill in the blanks of (1) by choosing the best option.

- Ans  1. examining  
 2. testing  
 3. experimenting  
 4. investigating

Question ID : 826662189

Status : Answered

Chosen Option :

Linked Answer Question:

Given below is a passage with four blanks. For each blank, four alternatives are provided. Select one of them to fill each blank.

In the 1870s, William Herschel, a British official in India, began \_\_\_\_\_ (1) with fingerprints as a hobby. He realized that no two people had exactly \_\_\_\_\_ (2) fingerprint and this fact \_\_\_\_\_ (3) used for identification. In 1901, Edward Henry \_\_\_\_\_ (4) fingerprints records for all the criminals serving a sentence of more than one month's imprisonment.

SubQuestion No : 11

Q.11 Read the passage and fill in the blanks of (3) by choosing the best option.

- Ans  1. must to be  
 2. could be  
 3. can be  
 4. was

Question ID : 826662191

Status : Answered

Chosen Option :



Q.12 Select the phrase/clause that best completes the sentence.  
\_\_\_\_\_ bad weather, the trip will be postponed to next week.

- Ans
- 1. In the case of
  - 2. In the case
  - 3. In case
  - 4. In case of

Question ID : 826662199

Status : Answered

Chosen Option 

Q.13 Select the phrase that best defines the phrase in bold.  
A **prima facie case** is such

- Ans
- 1. as it is made to seem at first sight
  - 2. as it seems at first sight
  - 3. as it seems to be after investigations
  - 4. as it turns out to be at the end

Question ID : 826662184

Status : Answered

Chosen Option 

Q.14 Choose the word which is closest to the meaning of the underlined word.  
Her instinctive reaction was to deny all that she had said earlier.

- Ans
- 1. automatic
  - 2. initial
  - 3. deliberate
  - 4. subconscious

Question ID : 826662194

Status : Answered

Chosen Option 

Q.15 Select the phrase/clause that best completes the sentence.  
Vipul: We all know the man is a thief, don't we?  
Vishal: Yes, \_\_\_\_\_

- Ans
- 1. but some one dares to say so publicly.
  - 2. but everyone dares to say so publicly.
  - 3. but someone dares to say so publicly.
  - 4. but no one dares to say so publicly.

Question ID : 826662198

Status : Answered

Chosen Option 

Q.16 Select the phrase/clause that best completes the sentence.  
Please vote for the member \_\_\_\_\_ has done the most for our village.

- Ans
- 1. who's you believe
  - 2. which you believe
  - 3. who you believe
  - 4. whom you believe

Question ID : 826662197

Status : Answered

Chosen Option 

Q.17 Select the phrase/clause that could replace the underlined section.  
There was so much of anger in his voice that I had no choice but to hang up.

- Ans
- 1. as much
  - 2. such a lot of
  - 3. so much
  - 4. a lot of

Question ID : 826662202

Status : Answered

Chosen Option

Q.18 Fill in the blanks with the word that best completes the sentence.  
Attacks by the enemy planes forced the British army to \_\_\_\_\_.

- Ans
- 1. revoke
  - 2. retract
  - 3. retrace
  - 4. retreat

Question ID : 826662193

Status : Answered

Chosen Option : 

Q.19 Select the phrasal verb that best completes the sentence.  
The firefighters fought the blaze while the crowd \_\_\_\_\_.

- Ans
- 1. looked in
  - 2. looked out
  - 3. looked away.
  - 4. looked on

Question ID : 826662187

Status : Answered

Chosen Option : 

Q.20 Select the correct spelling of the word to complete the sentence.  
\_\_\_\_\_ is a synonym for graveyard.

- Ans
- 1. sematary
  - 2. cemetery
  - 3. cematerly
  - 4. cemetary

Question ID : 826662185

Status : Answered

Chosen Option : 

Section : General Intelligence/Reasoning

Q.1 Choose the correct alternative that will complete the given series.  
BDF, HJL, NPR, ?

- Ans
- 1. TRP
  - 2. TVX
  - 3. TVY
  - 4. UWX

Question ID : 826662214

Status : Answered

Chosen Option : 

Q.2 Select the related number from the given alternatives.  
32 : 17 :: 104 : ?

- Ans
- 1. 55
  - 2. 53
  - 3. 57
  - 4. 60

Question ID : 826662205

Status : Answered

Chosen Option : 

Q.3 Arrange the following words in a meaningful order.

1. Hut
2. Bungalow
3. Palace
4. Flat

- Ans
- 1. 3, 1, 2, 4
  - 2. 2, 1, 3, 4

Question ID : 826662212

Status : Answered

Chosen Option :



3. 4, 2, 3, 1

4. 1, 4, 3, 2

**Q.4** In a row of boys, Atul is seventh from the start and twenty second from end. How many boys are there in the row?

**Ans**  1. 27

2. 28

3. 29

4. 30

Question ID : **826662216**

Status : **Answered**

Chosen Option 

**Q.5** Pointing towards a girl, Veena said, "Her mother is the only daughter of my mother." How is that girl related to Veena?

**Ans**  1. Niece

2. Mother

3. Daughter

4. Sister

Question ID : **826662208**

Status : **Answered**

Chosen Option 

**Q.6** Introducing a man, Shilpa said, "His brother's father is the only child of my grandfather." How is the man related to Shilpa?

**Ans**  1. Son


2. Cousin

3. Uncle

4. Brother

Question ID : **826662217**

Status : **Answered**

Chosen Option 

**Q.7** Select the one which is different from the other three alternatives.

**Ans**  1. Walk

2. Laugh

3. Play

4. Sleep

Question ID : **826662206**

Status : **Answered**

Chosen Option 

**Q.8** Manoj ranks sixteenth in a class of 40 students. What is his rank from the last?

**Ans**  1. 27<sup>th</sup>

2. 25<sup>th</sup>

3. 24<sup>th</sup>

4. 26<sup>th</sup>

Question ID : **826662207**

Status : **Answered**

Chosen Option 

**Q.9** What is related to 'Skin' is the same way as 'Taste' is related to 'Tongue'?

**Ans**  1. Itching

2. Colour

3. Feel

4. wound

Question ID : **826662203**

Status : **Answered**

Chosen Option : 3

**Q.10** Select the one which is different from the other three alternatives.

**Ans**  1. Ghee

Question ID : **826662215**

Status : **Answered**

Chosen



2. Milk  
 3. Cheese  
 4. Butter

**Q.11** From the alternatives, select the word which cannot be formed using the letters of the given word.  
 Given word: RECREATION

- Ans**  1. NATION  
 2. RATION  
 3. ACTION  
 4. CREATE

Question ID : 826662210

Status : Answered

Chosen Option :

**Q.12** In a certain code language, JUNGLE is written as ITMFKD. How will SUGAR be written in the same code?

- Ans**  1. TVHBS  
 2. RTHAQ  
 3. RTFZQ  
 4. RTFBS

Question ID : 826662209

Status : Answered

Chosen Option :

**Q.13** दिए गए विकल्पों में से संबंधित शब्द का चयन करें।

गाय : बछड़ा :: भेड़ : ?

- Ans**  1. मृग छौना  
 2. मेमना  
 3. शावक  
 4. पिल्ला

Question ID : 826662204

Status : Answered

Chosen Option :

**Q.14** Five products, P, Q, R, S and T are priced differently in a general store. Value of 'R' is Rs 500/-. 'P' is cheaper than 'R' but Costlier than 'Q'. T is costlier than 'R' but cheaper than 'S'. Which one of the product is costliest?

- Ans**  1. R  
 2. S  
 3. T  
 4. P

Question ID : 826662211

Status : Answered

Chosen Option :

**Q.15** Choose the correct alternative that will complete the given series.

11, 32, 53, 74, 95, ?

- Ans**  1. 113  
 2. 116  
 3. 106  
 4. 111

Question ID : 826662213

Status : Answered

Chosen Option :

Section : General Aptitude/Numerical Ability

**Q.1** Seven persons working for 8 hours a day can complete a work in 13 days. When they work  $6\frac{1}{2}$  hours a day and 9 more persons are brought to work, then in how many days will the work be completed?

- Ans**  1. 6  
 2. 9

Question ID : 826662232

Status : Answered

Chosen Option :

3. 7

4. 8

**Q.2** A train takes  $1\frac{1}{2}$  hours less for a journey of 528 km, if its speed is increased by  $5\frac{1}{2}$  km/hour from its usual speed. The usual speed of the train, in km/hour, is:

**Ans**  1. 44

2. 48

3. 55

4. 52

Question ID : 826662229

Status : Answered

Chosen Option :

**Q.3** A person sells an article on the price that is obtained after reducing its marked price by Rs. 640, and gains 15%. If the cost price of the article is Rs. 4800, what percentage of profit will he get if he sells it at the marked price?

**Ans**  1.  $28\frac{1}{3}$

2.  $30\frac{7}{16}$

3.  $26\frac{1}{4}$

4.  $30\frac{5}{12}$

Question ID : 826662228

Status : Answered

Chosen Option :

**Q.4** A, B, C और D चारों एक ही कंपनी के कर्मचारी हैं। 2003 और 2004 में उनमें से प्रत्येक के वेतन में वृद्धि क्रमशः निम्न प्रकार हुई:

A : p% और (p+1)%

B : (p+1)% और p%

C : (p+2)% और (p-1)% तथा

D : (p+4)% और (p-3)%

आरम्भ में सभी का वेतन समान था। किसके वेतन में सबसे कम वृद्धि हुई?

**Ans**  1. B

2. C

3. A

4. D

Question ID : 826662226

Status : Answered

Chosen Option :

**Q.5** By how much above the cost should goods be marked for sale so that after allowing a trade discount of 25% and a cash discount of 4%, a net gain of 8% on the cost is made?

**Ans**  1. 60%

2. 32%

3. 50%

4. 29%

Question ID : 826662227

Status : Answered

Chosen Option : 1

**Q.6** The angle of elevation and depression of the top and bottom of a lighthouse from the top of a building 60 m high are  $30^\circ$  and  $60^\circ$  respectively. If x meters is the difference between the heights of the light house and the building and y meters is the distance between them, then the approximate value of (x + y) is:

**Ans**  1. 48.3

2. 34.6

3. 54.6

4. 69.3

Question ID : 826662224

Status : Answered

Chosen Option : 3

**Q.7** The sum of a certain infinite geometric series is 20. When all the terms in the series are squared, the sum of the resulting series is 80. The sum of first three terms of the original series is:

**Ans**

Question ID : 826662220

Status : Answered

Chosen Option : 1

1.  $16\frac{4}{81}$

2.  $11\frac{1}{9}$

3.  $14\frac{2}{27}$

4.  $6\frac{2}{3}$

**Q.8** A and B can do a piece of work in 12 days while B and C can do it in 24 days, and C and A in 20 days. They all work together on it for 10 days and then B and C leave. How many days more A will take to complete the work?

**Ans**  1.  $3\frac{2}{3}$  days

2.  $3\frac{1}{3}$  days

3.  $4\frac{5}{11}$  days

4.  $2\frac{8}{11}$  days

Question ID : 826662231

Status : Answered

Chosen Option :

**Q.9** The product of the values of  $x$  for which  $2^{2x+3} - 65(2^x - 1) = 57$  is:

**Ans**  1. -9

2. 9

3. -3

4. 3

Question ID : 826662221

Status : Answered

Chosen Option :

**Q.10** A person X sets out to walk from A to B and at the same time another person Y starts to walk from B to A. After passing each other, X and Y complete their journeys in 3 hours 20 minutes and 4 hours 48 minutes respectively. If X walks at the speed of  $4\frac{1}{2}$  km/hour, what is the speed (in km/hour) of Y?

**Ans**  1.  $3\frac{3}{4}$

2.  $3\frac{1}{2}$

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

4.  $4\frac{1}{2}$

Question ID : 826662230

Status : Answered

Chosen Option :

**Q.11** If the ratio of the sums of first  $p$  terms and  $q$  terms of an arithmetic progression is  $p^2 : q^2$ , then the ratio of its  $p$ th and  $q$ th terms is:

**Ans**  1.  $(p + 1) : (q + 1)$

2.  $p : q$

3.  $(2p + 1) : (2q + 1)$

4.  $(2p - 1) : (2q - 1)$

Question ID : 826662219

Status : Answered

Chosen Option :

**Q.12** If  $a + b + c = 8$ ,  $a^2 + b^2 + c^2 = 30$  and  $a^3 + b^3 + c^3 = 134$ , then the value of  $(abc)^{-1}$  is:

**Ans**  1. 6

Question ID : 826662223

Status : Answered

Chosen



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✓ 2.  $\frac{1}{10}$

✗ 3.  $\frac{1}{6}$

✗ 4. 10

Q.13 The expression  $\left[ \frac{2x-7}{(x-2)(x-3)(x-4)} - \frac{1}{x^2-6x+8} \right] \div \frac{1}{x^2-5x+6}$ , where  $x > 4$ , is equal to:

Ans ✗ 1.  $\frac{1}{x-3}$

✓ 2. 1

✗ 3. -1

✗ 4.  $(x-2)(x-3)$

Question ID : 826662222

Status : Answered

Chosen Option :

Q.14 The sum of first 15 terms of the series  $2^2 + 5^2 + 8^2 + \dots$  is :

Ans ✗ 1. 10440

✗ 2. 10425

✓ 3. 10455

✗ 4. 10415

Question ID : 826662218

Status : Answered

Chosen Option :

Q.15 Fresh grapes contain 80% water by weight, whereas dried grapes contain 15% water by weight. How many kilograms of dried grapes can be obtained from 13.6 kg of fresh grapes?

Ans ✗ 1. 2.95

✗ 2. 3.6

✓ 3. 3.2

✗ 4. 2.72

Question ID : 826662225

Status : Answered

Chosen Option :

Section : General Knowledge/Awareness

Q.1 The award given to the coaches of sports and games in India is:

Ans ✓ 1. Dronacharya Award

✗ 2. Arjuna Award

✗ 3. Vir Chakra

✗ 4. Golden Boot

Question ID : 826662238

Status : Answered

Chosen Option :

Q.2 Who founded the "Brahmo Samaj"?

Ans ✓ 1. Raja Ram Mohun Roy

✗ 2. Swami Dayanand Saraswati

✗ 3. Rabindranath Tagore

✗ 4. MN Roy

Question ID : 826662233

Status : Answered

Chosen Option : 1

Q.3 The capital of Syria, where unrest is going on, is:

Ans ✓ 1. Damascus

Question ID : 826662236

Status : Answered

Chosen Option : 3

- 2. Doha
- 3. Baghdad
- 4. Kabul

Q.4 The recently released movie "Airlift", based on a true world event, is directed by:

- Ans
- 1. Sanjay Leela Bhansali
  - 2. Raja Krishna Menon
  - 3. Karan Johar
  - 4. Aditya Chopra

Question ID : 826662241

Status : Answered

Chosen Option :

Q.5 The virus causing microcephaly in new born infants of infected mothers is:

- Ans
- 1. Zika
  - 2. H1N1
  - 3. HIV
  - 4. Zoster

Question ID : 826662242

Status : Answered

Chosen Option :

Q.6 Some soldiers recently lost their lives in the Siachen glacier due to:

- Ans
- 1. An avalanche
  - 2. A cyclone
  - 3. An iceberg
  - 4. A blizzard

Question ID : 826662240

Status : Answered

Chosen Option :

Q.7 The correct chronological sequence of some of the Moghul Emperors who ruled India in the 16<sup>th</sup> and 17<sup>th</sup> Century is:

- Ans
- 1. Akbar, Humayun, Jahangir, Shah Jahan
  - 2. Babur, Humayun, Akbar, Shah Jahan
  - 3. Jahangir, Akbar, Humayun, Bahadur Shah Zafar
  - 4. Babur, Akbar, Humayun, Jahangir

Question ID : 826662235

Status : Answered

Chosen Option :

Q.8 The Grand Trunk Road was built by:

- Ans
- 1. Moghul King Akbar
  - 2. Emperor Ashoka
  - 3. Alexander the Great
  - 4. Sher Shah Suri

Question ID : 826662234

Status : Answered

Chosen Option :

Q.9 The slogan "Make in India" is likely to have the following outcome:

- Ans
- 1. Cause economic growth in the country
  - 2. Make judiciary efficient
  - 3. Build great sportsmen
  - 4. Improve education sector

Question ID : 826662239

Status : Answered

Chosen Option :

Q.10 The mountain range, NOT in India, is:

- Ans
- 1. Karakoram
  - 2. Satpura
  - 3. Rocky
  - 4. Shivalik

Question ID : 826662237

Status : Answered

Chosen Option :

