



Section : Physics and Mathematics

Q.1 If f_1 and f_2 are two linear functionals on vector space V defined as $f_1(a, b) = a + 2b$, $f_2(a, b) = 3a - b$, then $(3f_1 - 4f_2)(a, b)$ is equal to:

- Ans
- 1. $a + b$
 - 2. $2a + 6b$
 - 3. $9a + 10b$
 - 4. $-9a + 10b$

Question ID : 82666245

Status : Marked For Review

Chosen Option : 4

Q.2 The value of x for which the following series converges is:

$$x - \frac{x^2}{2} + \frac{x^3}{3} - \frac{x^4}{4} + \dots \infty$$

- Ans
- 1. the series converges for $-1 \leq x \leq 1$
 - 2. the series converges for $-1 < x \leq 1$
 - 3. the series diverges for $-1 < x < 1$
 - 4. the series converges for $x > 1$

Question ID : 82666243

Status : Marked For Review

Chosen Option : 1

Q.3 A nuclear reaction gives off a total of 10^{17} J energy. How much mass is spent in the process?

- Ans
- 1. 111 kg
 - 2. 1.11 kg
 - 3. 0.11 kg
 - 4. 81.3 kg

Question ID : 8266627

Status : Answered

Chosen Option : 2

Q.4 X-rays of wavelength of 0.4500 nm are scattered from free electrons in a target. What is the wavelength of photons scattered at 60° relative to the incident rays? ($h = 6.63 \times 10^{-34}$ J s, $m_e = 9.11 \times 10^{-31}$ kg, $c = 3 \times 10^8$ m/s)

- Ans
- 1. 0.4476 nm
 - 2. 0.4512 nm
 - 3. 0.4524 nm
 - 4. 0.4488 nm

Question ID : 82666220

Status : Marked For Review

Chosen Option : 2

Q.5 The Cauchy Riemann equations for $f(z) = u(x, y) + iv(x, y)$ to be analytic are:

Ans

Question ID : 82666254

Status : Marked For Review

1. $\frac{\partial u}{\partial x} = -\frac{\partial v}{\partial y}, \frac{\partial u}{\partial y} = \frac{\partial v}{\partial x}$

2. $\frac{\partial u}{\partial x} = \frac{\partial v}{\partial y}, \frac{\partial u}{\partial y} = -\frac{\partial v}{\partial x}$

3. $\frac{\partial u}{\partial x} = -\frac{\partial v}{\partial y}, \frac{\partial u}{\partial y} = -\frac{\partial v}{\partial x}$

4. $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 0, \frac{\partial^2 v}{\partial x^2} + \frac{\partial^2 v}{\partial y^2} = 0$

Chosen Option :

Q.6 An astronaut at rest has a heart rate of 65 beats/min. When the astronaut's spaceship moves at a speed of 0.6c, her heart rate as measured by an earth observer will be:

- Ans 1. 26 beats/min
 2. 104 beats/min
 3. 74 beats/min
 4. 52 beats/min

Question ID : 8266624

Status : Marked For Review

Chosen Option :

Q.7 Let $\sum u_n$ be a series of positive terms and let $\lim_{n \rightarrow \infty} u_n^{1/n} = l$, then, which among the following does not express the condition for the Cauchy's n^{th} root test?

- Ans 1. If $l > 1$, $\sum u_n$ diverges
 2. If $l < 1$, $\sum u_n$ converges
 3. If $l = 0$, the series neither converges nor diverges
 4. If $l = 1$, the test fails and the series may either converge or diverge

Question ID : 82666242

Status : Marked For Review

Chosen Option :

Q.8 A helium-neon laser emits red light having a wavelength of 632.8 nm and a power of 0.5 mW. How many photons are emitted each second?

- Ans 1. 2.6×10^{18}
 2. 4.8×10^{17}
 3. 3.3×10^{16}
 4. 1.6×10^{15}

Question ID : 82666218

Status : Marked For Review

Chosen Option :

Q.9 The Curie temperature for iron is:

- Ans 1. 627 K
 2. 1388 K
 3. 1043 K
 4. 3862 K

Question ID : 82666227

Status : Marked For Review

Chosen Option :

Q.10 Trapezoidal rule for the evaluation of $\int_a^b f(x) dx$ requires the interval [a, b] to be divided into:

- Ans 1. $2n$ subintervals of equal width
 2. any number of subintervals of equal width
 3. $2n + 1$ subintervals of equal width

Question ID : 82666252

Status : Marked For Review

Chosen Option :

X 4. $3n$ subintervals of equal width

Q.11 The Poynting vector of an electromagnetic wave in vacuum is $\mathbf{S} = \{(120 \text{ W/m}^2) \sin^2 [(8.0 \text{ rad/m}) z + (2.4 \times 10^9 \text{ rad/s}) t]\} \mathbf{k}$. What is the wavelength?

- Ans
- X** 1. 0.24 m
 - ✓** 2. 0.79 m
 - X** 3. 0.0488 m
 - X** 4. 0.068 m

Question ID : 82666223

Status : Marked For Review

Chosen Option :

Q.12 Complimentary function of the differential equation $x^2 \frac{d^2y}{dx^2} + 4x \frac{dy}{dx} + 2y = e^{x^2}$

- Ans
- ✓** 1. $c_1x^{-1} + c_2x^{-2}$
 - X** 2. $c_1x + c_2x^2$
 - X** 3. $c_1x^{-1} + c_2x^2$
 - X** 4. $c_1x + c_2x^{-2}$

Question ID : 82666239

Status : Marked For Review

Chosen Option :

Q.13 For any quadratic function $px^2 + qx + r$ the value of θ in Lagrange's theorem is always:

- Ans
- ✓** 1. $\frac{1}{2}$ (whatever p, q, r, a and h may be)
 - X** 2. $(a + h)/2$ (whatever p, q, r, a and h may be)
 - X** 3. 0 (whatever p, q, r, a and h may be)
 - X** 4. $(a-h)/2$ (whatever p, q, r, a and h may be)

Question ID : 82666234

Status : Marked For Review

Chosen Option :

Q.14 Fraunhofer diffraction at a double slit is observed using a light of wavelength λ . The width of each slit is a and the width of opaque portion between the two slits is b . The angular separation between any two consecutive maxima in diffraction pattern is:

- Ans
- ✓** 1. $\lambda/(a+b)$
 - X** 2. $\lambda b / (a+b)^2$
 - X** 3. $\lambda b/a^2$
 - X** 4. $\lambda a/b^2$

Question ID : 82666212

Status : Marked For Review

Chosen Option :

Q.15 Frame S' moves relative to frame S at $0.60c$ in the direction of increasing x . In frame S' , a particle is measured to have a velocity of $0.4c$ in the direction of increasing x' . The velocity of the particle as measured in frame S is:

- Ans
- X** 1. $0.26c$
 - X** 2. $0.92c$
 - X** 3. $0.52c$
 - ✓** 4. $0.81c$

Question ID : 8266625

Status : Marked For Review

Chosen Option :

Q.16 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 . Electric field of the wave can be written as:

- Ans
- X** 1. $\mathbf{E} = \{(240 \text{ N/C}) \sin [(2.09 \text{ rad/m}) x + (6.27 \times 10^8 \text{ rad/s}) t]\} \mathbf{j}$
 - ✓** 2. $\mathbf{E} = \{(240 \text{ N/C}) \sin [(3.14 \text{ rad/m}) x - (9.42 \times 10^8 \text{ rad/s}) t]\} \mathbf{j}$

Question ID : 82666224

Status : Marked For Review

Chosen Option :

~~X~~ 3.

$$\mathbf{E} = \{ (240 \text{ N/C}) \sin [(2.09 \text{ rad/m}) x - (6.27 \times 10^8 \text{ rad/s}) t] \} \mathbf{j}$$

~~X~~ 4.

$$\mathbf{E} = \{ (240 \text{ N/C}) \sin [(3.14 \text{ rad/m}) x + (9.42 \times 10^8 \text{ rad/s}) t] \} \mathbf{j}$$

Q.17 Interference fringes are observed with a biprism of refracting angle 1° and refractive index 1.5 on a screen 100 cm away from it. The wavelength of light used is 5890 Å. If the distance between the source and the biprism is 20 cm, the fringe width is:

- Ans ~~X~~ 1. 0.680 mm
~~X~~ 2. 0.101 mm
~~X~~ 3. 0.508 mm
 4. 0.202 mm

Question ID : 82666210

Status : **Marked For Review**

Chosen Option :

Q.18 The order of convergence of Newton Raphson method is:

- Ans 1. 2
~~X~~ 2. 0
~~X~~ 3. 1
~~X~~ 4. 3

Question ID : 82666249

Status : **Marked For Review**

Chosen Option :

Q.19 Which amongst the following expressions is not true?

- Ans ~~X~~ 1. $\lim_{n \rightarrow \infty} \frac{1+3+5+\dots+(2n-1)}{n^2} = 1$
~~X~~ 2. $\lim_{n \rightarrow \infty} \sqrt[n]{n} = 1$
~~X~~ 3. $\lim_{n \rightarrow \infty} \frac{3+2\sqrt{n}}{\sqrt{n}} = 2$
 4. $\lim_{n \rightarrow \infty} \frac{3n+2}{n+1} = 1$

Question ID : 82666241

Status : **Answered**

Chosen Option :

Q.20 What is the minimum X-ray wavelength produced when electrons are accelerated through a potential of 50000 V? ($h = 6.63 \times 10^{-34}$ J s, $c = 3 \times 10^8$ m/s, $1 \text{ eV} = 1.6 \times 10^{-19}$ J)

- Ans ~~X~~ 1. 35.8×10^{-12} m
~~X~~ 2. 68.3×10^{-12} m
~~X~~ 3. 19.6×10^{-12} m
 4. 24.9×10^{-12} m

Question ID : 82666229

Status : **Marked For Review**

Chosen Option :

Q.21 The value of $f(3)$ from the following table using the Lagrange's formula is:

x	0	1	2	4	5	6
f(x)	1	14	15	5	6	19

- Ans ~~X~~ 1. 10.5
~~X~~ 2. 11.5
~~X~~ 3. 11
 4. 10

Question ID : 82666251

Status : **Marked For Review**

Chosen Option :

Q.22

Question ID : 82666248

Status : **Marked For Review**

Consider the following assertions:

- I. Rank(ST) = Rank S = Rank T
- II. Rank (ST) = Rank S, if T is non-singular
- III. Rank (ST) = Rank T, if T is non-singular

where S, T : $V \rightarrow V$ are linear transformations of a finite dimensional vector space V. Which of these is/ are correct?

- Ans
- 1. only II
 - 2. only I
 - 3. II and III
 - 4. I and II

Chosen Option :

Q.23 A magnetic field of 1.2 T is applied to a paramagnetic gas. The atoms of the gas have magnetic dipole moment of 1.5×10^{-23} 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 = 1.38×10^{-23} J/K)

- Ans
- 1. 0.82 K
 - 2. 300 K
 - 3. 21.6 K
 - 4. 1.74 K

Question ID : 82666226

Status : Marked For Review

Chosen Option :

Q.24 If $y = (\sin^{-1}x)^2$ then:

- Ans
- 1. $(1-x^2)y_{n+2} - (2n+1)xy_{n+1} - n^2y_n = 0$
 - 2. $(1-x^2)y_{n+2} - (2n+1)xy_{n+1} + n^2y_n = 0$
 - 3. $(1-x^2)y_{n+2} + (2n+1)xy_{n+1} - n^2y_n = 0$
 - 4. $(1-x^2)y_{n+2} - (2n-1)xy_{n+1} - n^2y_n = 0$

Question ID : 82666232

Status : Marked For Review

Chosen Option :

Q.25 Let $X = (3, 2, -1)$, $Y = (2, 4, 1)$, $Z = (4, 0, -3)$ and $W = (10, 4, -5)$ be vectors in \mathbb{R}^3 , a real vector space. Which one of the following is correct?

- Ans
- 1. $Y + 2Z = W$, $X - Y = Z$
 - 2. $2X + Z = W$, $Y + Z = W$
 - 3. $X + Z = W$, $2X + Y = Z$
 - 4. $2X - Y = Z$, $Y + 2Z = W$

Question ID : 82666246

Status : Answered

Chosen Option :

Q.26 A rocket ship is 100 m in length when measured before leaving the launching pad. When in flight, a ground observer measures its length as 75 m. The velocity of the rocket ship is:

- Ans
- 1. 0.98×10^8 m/s
 - 2. 1.15×10^8 m/s
 - 3. 1.98×10^8 m/s
 - 4. 1.33×10^8 m/s

Question ID : 8266623

Status : Marked For Review

Chosen Option :

Q.27 The Gauss Seidal method gives results faster when the pivotal element are:

- Ans
- 1. equal to other coefficients
 - 2. less than equal to other coefficients
 - 3. larger than other coefficients

Question ID : 82666250

Status : Marked For Review

Chosen Option :

X 4. smaller than other coefficients

Q.28 The quantum mechanical model of the hydrogen atom requires that if the principal quantum number is 4, the number of different permitted orbital quantum numbers will be:

- Ans
- X** 1. five
 - X** 2. two
 - ✓** 3. four
 - X** 4. one

Question ID : 82666230

Status : Marked For Review

Chosen Option : **✖**

Q.29 A Fraunhofer diffraction is produced from a light source of 580 nm. The light goes through a single slit and onto a screen a meter away. The first dark fringe is 5.0 mm from the central bright fringe. What is the slit width?

- Ans
- X** 1. 0.24 mm
 - ✓** 2. 0.12 mm
 - X** 3. 0.10 mm
 - X** 4. 0.52 mm

Question ID : 82666211

Status : Marked For Review

Chosen Option : **✖**

Q.30 If $x \in S$ a non-empty set of real numbers, then:

- Ans
- X** 1. $\text{Inf } x = \text{Sup}(x)$
 - X** 2. $\text{Inf } x = - \text{Sup}(x)$
 - ✓** 3. $\text{Inf } x = - \text{Sup}(-x)$
 - X** 4. $\text{Inf } x = \text{Sup}(-x)$

Question ID : 82666240

Status : Marked For Review

Chosen Option : **✖**

Q.31 A light beam is incident on a metal target with a work function of 2.3 eV. If a stopping potential of 1.3 V is required, what is the wavelength of the incident light? ($h = 6.63 \times 10^{-34}$ J s, $c = 3 \times 10^8$ m/s, $1 \text{ eV} = 1.6 \times 10^{-19}$ J):

- Ans
- X** 1. 765 nm
 - ✓** 2. 345 nm
 - X** 3. 487 nm
 - X** 4. 1411 nm

Question ID : 82666228

Status : Marked For Review

Chosen Option : **✖**

Q.32 The differential equation $f_{xx} + 2f_{xy} + 4f_{yy} = 0$ is classified as:

- Ans
- X** 1. parabolic
 - ✓** 2. elliptic
 - X** 3. hyperbolic
 - X** 4. Circular

Question ID : 82666237

Status : Marked For Review

Chosen Option : **✖**

Q.33 Under which one of the following condition does the system of

equations $\begin{bmatrix} 1 & 2 & 4 \\ 2 & 1 & 2 \\ 1 & 2 & a-4 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 6 \\ 4 \\ a \end{bmatrix}$ have a unique solution?

- Ans
- X** 1. $a = 8$
 - ✓** 2. $a \neq 8$
 - X** 3. For all $a \in \mathbb{R}$
 - X** 4. For all $a \in \mathbb{Z}$

Question ID : 82666247

Status : Answered

Chosen Option : **✖**

Q.34 In a Newton's rings experiment, light of wavelength λ and a lens of radius of curvature R are used. The difference in diameters of 25th and 16th dark rings is:

- Ans
- 1. $4\sqrt{\lambda R}$
 - 2. $3\sqrt{\lambda R}$
 - 3. $2\sqrt{\lambda R}$
 - 4. $\sqrt{\lambda R}$

Question ID : 8266629

Status : Marked For Review

Chosen Option :

Q.35 Light of wavelength 600 nm is incident normally on a diffraction grating 3.00 cm wide. If second order line is observed at an angle of 30° , what is the total number of lines on the grating?

- Ans
- 1. 14500
 - 2. 15000
 - 3. 12500
 - 4. 13500

Question ID : 82666213

Status : Marked For Review

Chosen Option :

Q.36 The solution of the differential equation $\left(x \sin\left(\frac{y}{x}\right)\right) dx - \left(y \sin\left(\frac{y}{x}\right) - x\right) dy = 0$ is:

- Ans
- 1. $\cos\left(\frac{y}{x}\right) - \log x = c$
 - 2. $\sin\left(\frac{y}{x}\right) = 0$
 - 3. $\cos\left(\frac{y}{x}\right) = 0$
 - 4. $\sin\left(\frac{y}{x}\right) - \log x = c$

Question ID : 82666238

Status : Marked For Review

Chosen Option :

Q.37 If $f(z)$ is analytic in a simply connected domain D , then for every closed path C in D :

- Ans
- 1. $\oint_C f(z) dz = 1$
 - 2. $\oint_C f(z) dz = 0$
 - 3. $\oint_C f(z) dz \neq 0$
 - 4. $\oint_C f(z) dz \neq 1$

Question ID : 82666255

Status : Marked For Review

Chosen Option :

Q.38 The specific rotation of a 10% sugar solution is 60° . If the length of the polarimeter tube containing sugar solution is 20 cm, the plane of polarisation of light is rotated by:

- Ans
- 1. 24°
 - 2. 12°
 - 3. 19°
 - 4. 31°

Question ID : 82666214

Status : Marked For Review

Chosen Option :

Q.39 The momentum of an electron is measured as 4.80×10^{-27} kg m/s with an uncertainty of 2.4×10^{-29} kg m/s. What is the minimum uncertainty in the determination of its position? ($h = 6.63 \times 10^{-34}$ J s)

- Ans
- 1. 4.40×10^{-6} m

Question ID : 82666216

Status : Marked For Review

Chosen Option : 4

2. $1.12 \times 10^{-4} \text{ m}$

3. $6.40 \times 10^{-3} \text{ m}$

4. $3.20 \times 10^{-5} \text{ m}$

Q.40 The relativistic mass of a proton moving with a speed of $2.4 \times 10^8 \text{ m/s}$ (rest mass of proton = $1.67 \times 10^{-27} \text{ kg}$ and $c=3.0 \times 10^8 \text{ m/s}$) is:

Ans 1. $5.17 \times 10^{-27} \text{ kg}$

2. $2.78 \times 10^{-27} \text{ kg}$

3. $5.56 \times 10^{-27} \text{ kg}$

4. $1.39 \times 10^{-27} \text{ kg}$

Question ID : 8266622

Status : Marked For Review

Chosen Option :

Q.41 Two parallel plates (each of area 400 cm^2) of a capacitor are given equal and opposite charges of magnitude $3.56 \text{ } \mu\text{C}$. The space between the plates is filled with a dielectric. If the electric field in the dielectric is $1.2 \times 10^6 \text{ V/m}$, what is the dielectric constant of the material? ($\epsilon_0 = 8.85 \times 10^{-12} \text{ F/m}$)

Ans 1. 4.7

2. 8.4

3. 6.5

4. 2.4

Question ID : 82666225

Status : Marked For Review

Chosen Option :

Q.42 The electric field between two plates of a parallel plate (area = $8.0 \times 10^{-2} \text{ m}^2$) capacitor is given by $E = (6.8 \times 10^6 - 8.4 \times 10^5 t) \text{ V/m}$, 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. $3.57 \times 10^{-6} \text{ A}$

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

4. $7.36 \times 10^{-8} \text{ A}$

Question ID : 82666222

Status : Marked For Review

Chosen Option :

Q.43 A triangle of maximum area inscribed in a circle of radius r :

Ans 1. does not exist

2. is an isosceles triangle of height r

3.

is a right angled triangle with hypotenuse measuring $2r$

4. is an equilateral triangle

Question ID : 82666233

Status : Answered

Chosen Option :

Q.44 If A is a square matrix of order n the inverse A^{-1} exists, if _____.

Ans 1. 1 is not an eigen value of A

2. 1 is an eigen value of A

3. 0 is not an eigen value of A

4. 0 is an eigen value of A

Question ID : 82666244

Status : Marked For Review

Chosen Option : 3

Q.45 Solving by variation of parameter $y'' - 2y' + y = e^x \log x$, the value of Wronskian W is:

Ans 1. 2

Question ID : 82666236

Status : Marked For Review

2. -2
 3. e^{2x}
 4. e^{-2x}

Chosen Option :

Q.46 The value of $\int_0^{\pi/2} \sin^7 x \cos^4 x dx$ is equal to:

- Ans 1. $\frac{16}{5115}$
 2. $\frac{16}{1155}$
 3. $\frac{16}{1515}$
 4. $\frac{16}{1551}$

Question ID : 82666258

Status : Marked For Review

Chosen Option :

Q.47 The function $f(x) = x|x|$ is _____

- Ans 1. not continuous at the origin.
 2. differentiable at the origin.
 3. limit does not exist at origin.
 4. not differentiable at origin.

Question ID : 82666231

Status : Answered

Chosen Option :

Q.48 The area bounded by the parabola $y^2 = 4ax$ and its latus rectum is equal to:

- Ans 1. $\frac{8}{3}\pi a^2$
 2. $\frac{8}{3}a^2$
 3. $\frac{8}{3}(a^2+1)$
 4. $\frac{7}{3}a^2$

Question ID : 82666259

Status : Marked For Review

Chosen Option :

Q.49 A silicon monoxide ($n=1.45$) film of 100 nm thickness is used to coat a glass camera lens ($n=1.56$). What wavelength of light in the visible region will be most efficiently transmitted by this system?

- Ans 1. 628 nm
 2. 640 nm
 3. 580 nm
 4. 430 nm

Question ID : 8266628

Status : Marked For Review

Chosen Option :

Q.50 The spacing between layers of atoms in KCl crystal is 3.1×10^{-10} m. A beam of X-rays is constructively scattered in first order from the surface of the crystal at an angle of 2.9° . The wavelength of X-rays is _____ ($\sin 2.9^\circ = 0.0506$)

- Ans 1. 1.32×10^{-11} m
 2. 3.71×10^{-11} m
 3. 4.24×10^{-11} m

Question ID : 82666219

Status : Marked For Review

Chosen Option : 3

✓ 4. $3.14 \times 10^{-11} \text{ m}$

Q.51 The differential equation $(y^2 e^{xy^2} + 6x)dx + (2xye^{xy^2} - 4y)dy = 0$ is:

- Ans
- ✗ 1. non-linear, homogeneous and exact
 - ✓ 2. non-linear, non-homogeneous and exact
 - ✗ 3. non-linear, non-homogeneous and inexact
 - ✗ 4. linear, homogeneous and exact

Question ID : 82666235

Status : Marked For Review

Chosen Option :

Q.52 $\int \frac{dx}{(x+1)^2(x^2+1)} =$

- Ans
- ✗ 1. $\frac{1}{2} \log(x+1) + \frac{1}{2(x+1)} + \frac{1}{4} \log(x^2+1)$
 - ✗ 2. $\frac{1}{2} \log(x+1) + \frac{1}{2(x+1)} - \frac{1}{4} \log(x^2+1)$
 - ✓ 3. $\frac{1}{2} \log(x+1) - \frac{1}{2(x+1)} - \frac{1}{4} \log(x^2+1)$
 - ✗ 4. $\frac{1}{2} \log(x+1) - \frac{1}{2(x+1)} + \frac{1}{4} \log(x^2+1)$

Question ID : 82666257

Status : Marked For Review

Chosen Option :

Q.53 The series $\sum_{n=1}^{\infty} \frac{z^n}{n\sqrt{n+1}}$, $|z| \leq 1$ is:

- Ans
- ✗ 1. convergent but not uniformly
 - ✗ 2. absolutely convergent but not uniformly convergent
 - ✗ 3. uniformly but not absolutely convergent
 - ✓ 4. uniformly and absolutely convergent

Question ID : 82666256

Status : Marked For Review

Chosen Option :

Q.54 X-rays of wavelength of 0.0650 nm undergo Compton scattering from free electrons in carbon. If photons are scattered at 90° relative to the incident rays, what percentage of initial X-ray photon energy is transferred to an electron in such a scattering? ($h = 6.63 \times 10^{-34} \text{ J s}$, $m_e = 9.11 \times 10^{-31} \text{ kg}$, $c = 3 \times 10^8 \text{ m/s}$)

- Ans
- ✓ 1. 3.6 %
 - ✗ 2. 2.4 %
 - ✗ 3. 1.2 %
 - ✗ 4. 4.6 %

Question ID : 82666221

Status : Marked For Review

Chosen Option :

Q.55 The complex numbers $z_1 = 1 + 2i$, $z_2 = 4 - 2i$, $z_3 = 1 - 6i$ form the vertices of a:

- Ans
- ✓ 1. isosceles triangle
 - ✗ 2. scalene triangle
 - ✗ 3. right angled triangle
 - ✗ 4. equilateral triangle

Question ID : 82666253

Status : Marked For Review

Chosen Option :

Q.56 An electron in a TV tube has a speed of $6 \times 10^7 \text{ m/s}$. What is the de Broglie wavelength associated with the electron ($m = 9.11 \times 10^{-31} \text{ kg}$)?

Question ID : 82666217

- Ans 1. 0.248 Å
 2. 0.121 Å
 3. 0.347 Å
 4. 0.867 Å

Status : **Marked For Review**
 Chosen Option :

Q.57 According to Einstein's prediction in 1905, the measured values of the quantities that depend on the relative motion of the frame of reference and the observer are:

- Ans 1. mass and length
 2. time and length
 3. mass and time
 4. mass, length and time

Question ID : **8266621**
 Status : **Marked For Review**
 Chosen Option :

Q.58 The value of $\iint r \sin \theta dr d\theta$ over the cardioid $r = a(1 - \cos \theta)$ above the initial line is:

- Ans 1. $\frac{4}{3}a^2$
 2. $\frac{8}{3}a^2$
 3. $\frac{8}{3}\pi a^2$
 4. $\frac{4}{3}\pi a^2$

Question ID : **82666260**
 Status : **Marked For Review**
 Chosen Option :

Q.59 When light from a single point passes through calcite, it often forms two images. Each of two images are formed from light that has been polarised by:

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

Question ID : **82666215**
 Status : **Marked For Review**
 Chosen Option :

Q.60 An electron whose rest mass is 9.11×10^{-31} kg moves with a speed of $0.8c$. What is its kinetic energy? ($c = 3 \times 10^8$ m/s)

- Ans 1. 5.47×10^{-14} J
 2. 2.47×10^{-14} J
 3. 3.41×10^{-14} J
 4. 4.36×10^{-14} J

Question ID : **8266626**
 Status : **Marked For Review**
 Chosen Option :

Section : English Language

Q.1 *Select the phrase that best expresses the meaning of the underlined idiom.*
 It's no secret that he got elected by playing to the gallery.

- Ans 1. appealing to popular taste
 2. entertaining people
 3. influencing the public

Question ID : **82666265**
 Status : **Answered**
 Chosen Option :

✗ 4. performing cheap tricks

Q.2 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: Twitter is fast building up a whole new vocabulary.

S2: _____

S3: _____

S4: With over 25 million users accessing Twitter, it does not come as a surprise that virtual is fast becoming real.

P: The phenomenon reflects the rise of social networking and its influence on popular culture.

Q: Words like - "Tweethart"; a user admired by many, and 'tweet tooth,' a strong desire to send a tweet - have made it to the dictionary.

R: Publishers of Collins dictionary have added dozens of new words to its latest edition, thanks to the social networking site.

Ans ✗ 1. QR

✗ 2. RQ

✗ 3. PQ

✓ 4. RP

Question ID : 82666274

Status : Answered

Chosen Option : 

Q.3 Select the phrasal verb that best completes the sentence.

Parents often worry about their teenage children _____ a huge phone bill.

Ans ✗ 1. building up

✗ 2. making up

✓ 3. running up

✗ 4. ending up

Question ID : 82666266

Status : Marked For Review

Chosen Option : 

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

SUPERFICIAL

Ans ✗ 1. Artificial


✗ 2. Fake

✓ 3. Shallow

✗ 4. Stupid

Question ID : 82666261

Status : Marked For Review

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.

No one can _____ (1) when an earthquake will occur. Some earthquakes are _____ (2) felt and cause little damage. Others are disastrous and the damage is extensive. However, buildings are stronger today and emergency crews are _____ (3) quickly. These actions help lessen the losses _____ (4) by earthquakes.

SubQuestion No : 5

Q.5 Read the passage and fill in the blanks of (3) by choosing the best option.

Ans ✗ 1. brought up

✗ 2. set up

✓ 3. put in place

Question ID : 82666270

Status : Marked For Review

Chosen Option : 

4. drawn 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.

No one can _____ (1) when an earthquake will occur. Some earthquakes are _____ (2) felt and cause little damage. Others are disastrous and the damage is extensive. However, buildings are stronger today and emergency crews are _____ (3) quickly. These actions help lessen the losses _____ (4) by earthquakes.

SubQuestion No : 6

Q.6 Read the passage and fill in the blanks of (2) by choosing the best option.

- Ans**
- 1. barely
 - 2. strongly
 - 3. hardly
 - 4. easily

Question ID : **82666269**

Status : **Marked For Review**

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.

No one can _____ (1) when an earthquake will occur. Some earthquakes are _____ (2) felt and cause little damage. Others are disastrous and the damage is extensive. However, buildings are stronger today and emergency crews are _____ (3) quickly. These actions help lessen the losses _____ (4) by earthquakes.

SubQuestion No : 7

Q.7 Read the passage and fill in the blanks of (1) by choosing the best option.

- Ans**
- 1. predict
 - 2. forecast
 - 3. think
 - 4. plan

Question ID : **82666268**

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.

No one can _____ (1) when an earthquake will occur. Some earthquakes are _____ (2) felt and cause little damage. Others are disastrous and the damage is extensive. However, buildings are stronger today and emergency crews are _____ (3) quickly. These actions help lessen the losses _____ (4) by earthquakes.

SubQuestion No : 8

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

- Ans**
- 1. are caused
 - 2. that is caused
 - 3. that will be caused
 - 4. caused

Question ID : **82666271**

Status : **Marked For Review**

Chosen Option :

Q.9 It is important for the president _____ seen as a threat.

- Ans
- 1. to not be
 - 2. not to be
 - 3. that she wasn't
 - 4. not being

Question ID : 82666279

Status : Answered

Chosen Option :

Q.10 Select the phrase/clause that could replace the underlined section.
When I turn forty five, I will be a doctor for twenty years.

- Ans
- 1. will have been a doctor for twenty years.
 - 2. would be a doctor for twenty years.
 - 3. would have been a doctor for twenty years.
 - 4. shall be a doctor for twenty years.

Question ID : 82666280

Status : Answered

Chosen Option :

Q.11 Select the phrase/clause that best completes the sentence.
The motion to increase pay, _____ was widely praised.

- Ans
- 1. which will be passed unanimously
 - 2. has been passed unanimously
 - 3. which was passed unanimously
 - 4. that could be passed unanimously

Question ID : 82666276

Status : Answered

Chosen Option :

Q.12 Fill in the blanks with the word that best completes the sentence.
Shilpa was so _____ that she didn't realize that the milk had boiled over.

- Ans
- 1. distracted
 - 2. confused
 - 3. preoccupied
 - 4. absorbed

Question ID : 82666272

Status : Answered

Chosen Option :

Q.13 Select the word that best defines the phrase.
Giving undue favours to one's own kith and kin

- Ans
- 1. Patriotism
 - 2. Nepotism
 - 3. Jingoism
 - 4. Favouritism

Question ID : 82666263

Status : Marked For Review

Chosen Option :

Q.14 Select the phrase/clause that could replace the underlined section.
Although we had tickets, we will be kept waiting for an hour.

- Ans
- 1. had been kept waiting
 - 2. had kept waiting
 - 3. were kept waiting
 - 4. had been made to keep waiting

Question ID : 82666281

Status : Answered

Chosen Option :

Q.15 Anita: What about our plans for the weekend?
Mehta: Everything set. But if Anna comes to know about it, _____

- Ans
- 1. the whole thing could be ruined.
 - 2. the whole thing should be ruined.
 - 3. the whole thing must be ruined.
 - 4. the whole thing has to be ruined.

Question ID : 82666277

Status : **Marked For Review**Chosen Option :

Q.16 Choose the word which is closest to the meaning of the underlined word.
The team of intrepid explorers made their way across the frozen Arctic.

- Ans
- 1. curious
 - 2. strong
 - 3. fearful
 - 4. brave

Question ID : 82666273

Status : **Answered**Chosen Option :

Q.17 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: In January 1991, police arrested a man for selling magic pencils for \$225 each.

S2: _____

S3: _____

S4: These would make the computers mark wrong answers as correct.

- P. According to him, the pencils contained electronic signals which would confuse the computers marking the exams.
- Q. The pencils, the man claimed, would automatically produce correct answers in university entrance exams.
- R. Dozens of students who had bought the pencils complained that the magic hadn't worked for them.

- Ans
- 1. QP
 - 2. PR
 - 3. RQ
 - 4. PQ

Question ID : 82666275

Status : **Marked For Review**Chosen Option :

Q.18 _____ my fellow employees, I would like to thank the management for the support they have given us in organizing the event.

- Ans
- 1. From the behalf
 - 2. From the behalf of
 - 3. On the behalf of
 - 4. On behalf of

Question ID : 82666278

Status : **Answered**

Chosen Option : 4

Q.19 Select the correct spelling of the word to complete the sentence.
_____ means to be steady and persistent in one's course of action.

- Ans
- 1. Perseverance
 - 2. Perserverance
 - 3. Persaverance
 - 4. Perservance

Question ID : 82666264

Status : **Answered**

Chosen Option : 1

Q.20 Select the word that is opposite in meaning to the word in capitals.

COMMON

- Ans 1. Rare
 2. Regular
 3. Worthless
 4. Priceless

Question ID : 82666262

Status : Answered

Chosen Option :

Section : General Intelligence/Reasoning

Q.1 From the alternatives, select the word that cannot be formed using the letters in the given word.
Given Word: INDUSTRY

- Ans 1. TURN
 2. DRY
 3. DUSTER
 4. STUDY

Question ID : 82666289

Status : Answered

Chosen Option :

Q.2 Select the related number from the given alternatives
15 : 105 :: 17 : ?

- Ans 1. 126
 2. 136
 3. 153
 4. 119

Question ID : 82666284

Status : Answered

Chosen Option :

Q.3 Select the one which is different from the other three alternatives.

- Ans 1. Diamond
 2. Bangle
 3. Ring
 4. Necklace

Question ID : 82666285

Status : Answered

Chosen Option :

Q.4 Select the related word from the given alternatives
Shoe : leather :: Table : ?

- Ans 1. Desk
 2. Wood
 3. Chair
 4. Carpenter

Question ID : 82666283

Status : Answered

Chosen Option :

Q.5 Arrange the following words in a meaningful order (ascending Order)
1. Point 2. Triangle 3. Square 4. Angle 5. Line

- Ans 1. 1, 5, 4, 2, 3
 2. 2, 1, 4, 5, 3
 3. 3, 2, 1, 5, 4
 4. 4, 1, 5, 2, 3

Question ID : 82666291

Status : Answered

Chosen Option :


Q.6

Question ID : 82666292

Choose the correct alternative that will complete the given series.

110, 99, 86, 71, 54, ?

Status : **Answered**


Chosen Option : 

- Ans
- 1. 33
 - 2. 39
 - 3. 37
 - 4. 35

Q.7 Introducing a boy, Anita said, "He is the son of the only child of my grandfather." How is Anita related to that boy?

Question ID : **82666287**

Status : **Answered**


Chosen Option : 

- Ans
- 1. Cousin
 - 2. Niece
 - 3. Sister
 - 4. Aunt

Q.8 Today Ravi came late to the school. Suman came twenty minutes later but Ajay reached five minutes before Ravi's arrival. Shrikant reached two minutes before Suman reached the school. Who was the last to reach the school?

Question ID : **82666290**

Status : **Answered**

Chosen Option : 

- Ans
- 1. Srikant
 - 2. Ravi
 - 3. Suman
 - 4. Ajay

Q.9 A class of boys stands in a single line. One boy is 22nd in order from both the ends. How many boys are there in the class?

Question ID : **82666286**

Status : **Answered**


Chosen Option : 

- Ans
- 1. 43
 - 2. 45
 - 3. 44
 - 4. 42

Q.10 Select the relative word from the given alternatives.
Breathe : Nose :: Walk : ?

Question ID : **82666295**

Status : **Answered**

Chosen Option : 

- Ans
- 1. Walking stick
 - 2. Pavement
 - 3. Foot
 - 4. Crutch

Q.11 What is related to 'Bird' in the same way as 'House' is related to 'Man'?

Question ID : **82666294**

Status : **Answered**

Chosen Option : 

- Ans
- 1. Nest
 - 2. Wings
 - 3. Hole
 - 4. Sky

Q.12 What is related to 'Bus' in the same way as 'Rail' is related to 'Train'?

Question ID : **82666282**

Status : **Answered**

Chosen Option : 

- Ans
- 1. Passenger
 - 2. Bus stand

3. Road
 4. Conductor

Q.13 Choose the Correct alternative that will complete the given series
 FIL, HKN, JMP, ?

- Ans** 1. LOR
 2. LOM
 3. LON
 4. LOQ

Question ID : **82666293**
 Status : **Answered**
 Chosen Option :

Q.14 If in a certain code language, UTENSIL is coded as WVGPUKN, how will TRIANGLE be coded in the same language?

- Ans** 1. SQHZMFKD
 2. VTKCPING
 3. VTKBOHNG
 4. USJBOHMF

Question ID : **82666288**
 Status : **Answered**
 Chosen Option :

Q.15 Select the related number from the given alternatives.
 62 : 30 :: 84 : ?

- Ans** 1. 43
 2. 44
 3. 42
 4. 41

Question ID : **82666296**
 Status : **Answered**
 Chosen Option :

Section : **General Aptitude/Numerical Ability**

Q.1 The first seven terms of an arithmetic progression are $7x+4$, $9y$, $7z+6$, $4x+10$, $3k$, $3x+6$, and $k+12$. The second, fifth and seventh terms of this progression form an infinite geometric progression. The sum of the terms of this geometric progression is:

- Ans** 1. 162
 2. 106
 3. 126
 4. 180

Question ID : **82666298**
 Status : **Marked For Review**
 Chosen Option :

Q.2 The price of an article increases by 10% every year. If the difference between the prices at the end of the 3rd year and the 4th year was Rs. 423.5, what was the price of the article at the end of second year?

- Ans** 1. Rs 3465.9
 2. Rs 4235
 3. Rs 3850
 4. Rs 4658.5

Question ID : **826662105**
 Status : **Marked For Review**
 Chosen Option :

Q.3 The profit percent of A and B is the same for selling an article for Rs. 8400 each, but A calculated his profit on the selling price while B calculated it on its cost price, which is equal to $33\frac{1}{3}\%$. The sum of their profit (in Rs.) is

- Ans** 1. Rs 2800
 2. Rs 4900
 3. Rs 3500

Question ID : **826662107**
 Status : **Answered**
 Chosen Option :

X 4. Rs 2100

Q.4 A and B undertook to do a piece of work for Rs. 48,000. A could do it alone in 5 days and B could do it alone in 8 days. With the help of C and D, they finished the work in 3 days. If the work done by C was twice that of the work done by D, then the difference between the shares of A and C was:

- Ans**
- X** 1. Rs. 12960
 - X** 2. Rs. 34080
 - X** 3. Rs. 20640
 - ✓** 4. Rs 28000

Question ID : 826662111

Status : **Marked For Review**Chosen Option : **🚫**

Q.5 The sum of first 12 terms of the series

$$1^2 + (1^2 + 2^2) + (1^2 + 2^2 + 3^2) + \dots \text{ is}$$

- Ans**
- X** 1. 2197
 - X** 2. 2028
 - X** 3. 1372
 - ✓** 4. 2366

Question ID : 82666297

Status : **Marked For Review**Chosen Option : **🚫**

Q.6 $33\frac{1}{3}\%$ of a journey was covered at the speed of 20 km/hour, one-fourth at 30 km/hour and the rest at 50 km/hour. The average speed (in km/hour) for the whole journey was:

- Ans**
- ✓** 1. 30
 - X** 2. $40\frac{1}{3}$
 - X** 3. 32
 - X** 4. $33\frac{1}{3}$

Question ID : 826662109

Status : **Marked For Review**Chosen Option : **🚫**

Q.7 The monthly incomes of A and B are Rs. 60000 and Rs. 48000 respectively. A saves $33\frac{1}{3}\%$ of his income and B spends 60% of his income. By what percent should A's savings be increased such that the ratio of expenditures of A and B gets reversed?

- Ans**
- X** 1. 86.56
 - ✓** 2. 96.32
 - X** 3. 66.67
 - X** 4. 93.33

Question ID : 826662104

Status : **Marked For Review**Chosen Option : **🚫**

Q.8 If the difference between the cost price and selling price of an article is Rs. x and the loss incurred is y%, then the selling price of the article (in Rupees) is:

- Ans**
- X** 1. $(50-y) \left(\frac{x}{y}\right)$
 - X** 2. $(100-y) \left(\frac{y}{x}\right)$
 - X** 3. $(50+y) \left(\frac{x}{y}\right)$
 - ✓** 4. $(100-y) \left(\frac{x}{y}\right)$

Question ID : 826662106

Status : **Answered**Chosen Option : **🚫**

Q.9 To do a certain work, B takes four times as long as A and C together and C takes three times as long as A and B together. If all the three working together complete the work in 11 days, how long would A alone take to complete the work?

- Ans**
- X** 1. 18 days

Question ID : 826662110

Status : **Marked For Review**

Chosen Option : 1

2. 44 days

3. 55 days

4. 20 days

Q.10 The expression $\left[\frac{1}{1-x} + \frac{3-5x^2}{1-x^2} - \frac{4+5x}{1+x+x^2}\right] \times \frac{x^2-1}{2x^2}$, where $x > 1$, is equal to:

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

2. -1

3. 2

4. 0

Question ID : 826662101

Status : Marked For Review

Chosen Option :

Q.11 If the 7th term of an arithmetic progression is $\frac{1}{9}$ and its 9th term is $\frac{1}{7}$, then its 63rd term is:

Ans 1. 2

2. 1

3. 8

4. 3

Question ID : 82666299

Status : Marked For Review

Chosen Option :

Q.12 Sudha can row her boat at a speed of 5 km/hour in still water. If it takes her $3\frac{15}{16}$ hours more to row the boat 10.5 km upstream than to return downstream, then the speed of the stream (in km/h) is:

Ans 1. 2

2. 3

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

4. $3\frac{1}{2}$

Question ID : 826662108

Status : Marked For Review

Chosen Option :

Q.13 If $x^2 = y + z$, $y^2 = z + x$ and $z^2 = x + y$, then the value of $\sqrt{\frac{1}{1+x} + \frac{1}{1+y} + \frac{1}{1+z}}$ is

Ans 1. 2

2. ± 1

3. ± 2

4. 1

Question ID : 826662102

Status : Answered

Chosen Option :

Q.14 The sum of the values of x for which

$$7^{1+x} + 7^{1-x} = 50, \text{ is}$$

Ans 1. 0

2. -2

3. -1

4. 2

Question ID : 826662100

Status : Answered

Chosen Option :

Q.15 A spherical balloon of radius r metres subtends an angle θ at the eye of an observer. If the angle of elevation of its centre is α , then the height of the centre of the balloon is:

Ans 1. $r \sin \frac{\alpha}{2} \operatorname{cosec} \theta$

Question ID : 826662103

Status : Not Attempted

Chosen Option : --

2. $r \sin \frac{\theta}{2} \operatorname{cosec} \alpha$

3. $r \sin \theta \operatorname{cosec} \frac{\alpha}{2}$

4. $r \sin \alpha \operatorname{cosec} \frac{\theta}{2}$

Section : General Knowledge/Awareness

Q.1 Zika virus is transmitted by the same species of mosquito whose infected bite causes:

Ans 1. Dengue

2. Malaria

3. Filaria

4. Ebola fever

Question ID : 826662118

Status : Answered

Chosen Option :

Q.2 The flow of displaced people towards European countries is still continuing. The majority of the migrants are from:

Ans 1. Saudi Arabia

2. Afghanistan

3. Iran

4. Syria

Question ID : 826662121

Status : Answered

Chosen Option :

Q.3 The author of the book "To kill a mocking bird" died recently. She was:

Ans 1. Agatha Christie

2. Susan Sontag

3. Harper Lee

4. Jane Austen

Question ID : 826662120

Status : Answered

Chosen Option :

Q.4 Which of the following Indian rivers flows into the Arabian Sea?

Ans 1. Narmada

2. Brahmaputra

3. Ravi

4. Subarnarekha

Question ID : 826662116

Status : Answered

Chosen Option :

Q.5 Which one of the following is NOT a pair of North Eastern states of India?

Ans 1. Assam and Bhutan

2. Arunachal Pradesh and Manipur

3. Tripura and Assam

4. Meghalaya and Mizoram

Question ID : 826662115

Status : Answered

Chosen Option :

Q.6 The ancient Indian literature regarding herbal medicine is in

Ans 1. Charak Samhita

2. Maha Parinirvana Suttanta

Question ID : 826662112

Status : Answered

Chosen Option :

- 3. Samveda
- 4. Brighu Samhita

Q.7 Which one of the following was NOT a Moghul emperor?

- Ans
- 1. Safdarjang
 - 2. Humayun
 - 3. Jahangir
 - 4. Bahadur Shah II

Question ID : 826662113

Status : Answered

Chosen Option :

Q.8 Novak Djokovic, the winner of multiple Grand Slam Tennis tournaments, is from:

- Ans
- 1. Serbia
 - 2. Croatia
 - 3. France
 - 4. England

Question ID : 826662117

Status : Answered

Chosen Option :

Q.9 The first World War ended in the year:

- Ans
- 1. 1945
 - 2. 1857
 - 3. 1706
 - 4. 1918

Question ID : 826662114

Status : Answered

Chosen Option :

Q.10 Recently a leopard wandered into a school in Bangalore. Such an unusual event is attributed to:

- Ans
- 1. Climate change
 - 2. Loss of habitat
 - 3. El nino
 - 4. Global warming

Question ID : 826662119

Status : Not Attempted

Chosen Option : --

