Q1	Four objects have masses, 11 g, 12.4g, 66.37 g and 4.201g respectively. The total mass of all the four objects correct to appropriate significant figures is:
Q1_OA	93.971 g
Q1_OB	93.97 g
Q1_OC	94 g
Q1_OD	94.0 g
Q2	In an experiment to determine the value of acceleration due to gravity (g) using a simple pendulum, the length of the pendulum is recorded as (60.0 ± 0.1) cm and corresponding time period of oscillation as (1.55 ± 0.01) s. The maximum percentage error in value of g is:
Q2_OA	0.7
Q2_OB	1.5
Q2_OC	3.2
Q2_OD	4.7
Q3	Kiran performs an experiment to determine the resistivity of given wire using ohm's law experiment .She records the following data: Length of wire: (240 ± 0.1) cm, Diameter of wire: (1.00 ± 0.01) mm, Current through the wire: (1.0 ± 0.1) A, Potential drop across the wire: (50 ± 1) mV. The resistivity of the wire is:
Q3_OA	$(1.4 \pm 0.1) \times 10^{-8}$ Ω m
Q3_OB	$(1.6 \pm 0.2) \times 10^{-8}$ Ω m
Q3_OC	$(1.6 \pm 0.1) \times 10^{-8}$ Ω m
Q3_OD	$(2.1 \pm 0.1) \times 10^{-8}$ Ω m
Q4	A wheel is turning at a constant rate. It completes 50 revolutions in 5s. Its angular speed, in rad/s, is:
Q4_OA	0.31
Q4_OB	0.63
Q4_OC	31
Q4_OD	63
Q5	A wheel starts from rest. Its angular acceleration at any time t is given by $4t^3$. The angle through which it turns in time t is given by:
Q5_OA	$t^5 / 15$
Q5_OB	$t^5 / 10$
Q5_OC	$t^5 / 5$
Q5_OD	t^5
Q6	The moment of inertia of a circular disc, about an axis perpendicular to the disc and passing through its centre is 0.80 kg m^2.When a 1.5 kg mass is added

	to its rim, 0.20 m from the axis, its moment of inertia becomes:
Q6_OA	0.40 kg m^2
Q6_OB	0.46 kg m^2
Q6_OC	0.76 kg m^2
Q6_OD	0.86 kg m^2
Q7	The length of a cylinder is 0.30 m and its radius is 0.16 m. Its moment of inertia, about the cylinder axis on which it is mounted, is 0.032 kg m^2. A string is wound around the cylinder and pulled with a force of 1.5 N. The angular acceleration, in rad/s^2, of the cylinder is:
Q7_OA	1.5
Q7_OB	2.5
Q7_OC	7.5
Q7_OD	9.0
Q8	A particle moves in a simple harmonic motion with period T along the x-axis back and forth, from $x = -x_m$ to $x = + x_m$. At time t = 0, it is at $x = -x_m$. At t = 0.25T, it is:
Q8_OA	at x = 0 and is travelling towards $x = -x_m$
Q8_OB	at x = 0 and is travelling towards $x = +x_m$
Q8_OC	at $x = +x_m$ and is at rest
Q8_OD	between x = 0 and $x = +x_m$ and travelling towards $x = +x_m$
Q9	In simple harmonic motion, the displacement is maximum when the:
Q9_OA	velocity is maximum
Q9_OB	acceleration is zero
Q9_OC	velocity is zero
Q9_OD	kinetic energy is maximum
Q10	A particle is in simple harmonic motion along the x- axis, with an amplitude x = A. When it is at x = A/2, its kinetic energy (K) is 6 J and its potential energy (U, measured with U = 0 at x = 0) is 2J.Which of the following is correct when the particle is at x = + A?
Q10_OA	K= 8 J, U = 0
Q10_OB	K= 6 J, U= - 2 J
Q10_OC	K= 6 J, U= 2 J
Q10_OD	K= 0, U = 8 J
Q11	Two sinusoidal waves have the same angular frequency, the same amplitude A and travel in the same direction in the same medium. If they differ in phase by 60^o, the amplitude of the resultant wave is:
Q11_OA	A / 2
Q11_OB	$A\sqrt{3}$ / 2
Q11_OC	A

Q11_OD	$A\sqrt{3}$
Q12	A source emits sound with a frequency of 1000 Hz. Both the source and the observer are moving towards each other with the same speed, 90 m/s. If the speed of the sound is 340 m/s, the frequency of sound as heard by the observer is:
Q12_OA	275 Hz
Q12_OB	581 Hz
Q12_OC	1720 Hz
Q12_OD	2150 Hz
Q13	The dipole moment of a dipole has a magnitude of 4.0×10^{-9} Cm. It is placed perpendicular to an electric field, 120 N/C. The dipole rotates so it is in the same direction as the field. The work done by the field in this process is:
Q13_OA	9.6×10^{-7} J
Q13_OB	-9.6×10^{-7} J
Q13_OC	4.8×10^{-7} J
Q13_OD	-4.8×10^{-7} J
Q14	A 1.0 μC charge is placed at the centre of a cube of side 10 cm. The total electric flux through all sides of the cube is:
Q14_OA	5.5×10^{3} N m^2 /C
Q14_OB	2.1×10^{4} N m^2 /C
Q14_OC	1.1×10^{5} N m^2 /C
Q14_OD	1.4×10^{4} N m^2 /C
Q15	Twenty seven identical spherical raindrops are each at a potential V, relative to the potential far away. They combine and form one spherical drop. The potential of the new drop is:
Q15_OA	V / 27
Q15_OB	27 V
Q15_OC	V / 9
Q15_OD	9 V
Q16	Two charges q_1 and q_2 are located at x = a and x = 2a, respectively. A third charge Q is placed at the origin of the x- axis. For the net force on Q to be zero, q_1 / q_2 must be:
Q16_OA	$\frac{1}{2}$
Q16_OB	$-\frac{1}{2}$
Q16_OC	$\frac{1}{4}$
Q16_OD	$-\frac{1}{4}$
Q17	A parallel plate capacitor is charged by a battery. After charging, the battery is

	disconnected. Then the plates are pulled apart so that the separation between the plates becomes four times the original separation. Which of the following quantities becomes four times due to this process?
Q17_OA	Capacitance
Q17_OB	Stored energy
Q17_OC	Surface charge density on each plate
Q17_OD	Electric field between the plates
Q18	A metallic wire of cross-sectional area 3.0×10^{-6} m^2 carries a current of 6.0 A. If the electron drift speed is 3.0×10^{-4} m/s ,the free electron density (electrons/m^3)in the wire is:
Q18_OA	4.2×10^{28}
Q18_OB	8.5×10^{28}
Q18_OC	1.1×10^{29}
Q18_OD	1.6×10^{29}
Q19	Five resistors, each of value 20 Ω, are connected in parallel. This combination is connected to a 20 V emf device. The current in any one of the resistors is:
Q19_OA	0.50 A
Q19_OB	1.0 A
Q19_OC	2.0 A
Q19_OD	4.0 A
Q20	Two identical batteries, each of emf 12 V have the same internal resistance, 1Ω.They are connected in parallel by connecting their positive terminals together and their negative terminals together. This combination is then connected to a 5.5 Ω resistor. The current in the 5.5 Ω resistor is:
Q20_OA	0.5 A
Q20_OB	1.0 A
Q20_OC	1.5 A
Q20_OD	2.0 A
Q21	A battery of 6 V is used to pass a current of 0.3 A through a bulb for 5 minutes. The energy dissipated by this bulb in 5 minutes is:
Q21_OA	9 J
Q21_OB	90 J
Q21_OC	270 J
Q21_OD	540 J
Q22	The focal length of a diverging lens with one flat surface is –20 cm. The radius of curvature for the curved surface is 10 cm. The refractive index of the lens is:
Q22_OA	1.2
Q22_OB	1.3

Q22_OC	1.5
Q22_OD	1.6
Q23	In a Young's double slit experiment; the separation between the slits is doubled. To maintain the same fringe width, the distance between the slit and screen, D must be changed to:
Q23_OA	2 D
Q23_OB	4 D
Q23_OC	D/2
Q23_OD	D/ 4
Q24	An object is placed in front of a convex lens at a distance less than f. The image formed is:
Q24_OA	real and smaller than the object
Q24_OB	real and larger than the object
Q24_OC	virtual and smaller than the object
Q24_OD	virtual and larger than the object
Q25	The refractive index for water and glass are respectively 1.50 and 1.33. The total internal reflection at an interface between this glass and water:
Q25_OA	occurs whenever light goes from glass to water
Q25_OB	occurs whenever light goes from water to glass
Q25_OC	may occur whenever light goes from glass to water
Q25_OD	may occur whenever light goes from water to glass
Q26	If $x = i + 2i^2 + 3i^3 + 4i^4 + \ldots\ldots\ldots\ldots + 2006\, i^{2006}$, where $i = \sqrt{-1}$, then x is equal to:
Q26_OA	$-1003 + 1004i$
Q26_OB	$1004 + 1003i$
Q26_OC	$-1004 + 1003i$
Q26_OD	$-1004 - 1003i$
Q27	If $z_1 = 8 + 4i$, $z_2 = 6 + 4i$ and z is a complex number such that $\arg\left(\frac{z - z_1}{z - z_2}\right) = \frac{\pi}{4}$, then:
Q27_OA	$\lvert Z - 8 - 4i\rvert = \sqrt{15}$
Q27_OB	$\lvert Z - 7 - 5i\rvert = \sqrt{2}$
Q27_OC	$\lvert Z - 8 - 5i\rvert = \sqrt{2}$
Q27_OD	$\lvert Z - 7i\rvert = \sqrt{15}$
Q28	If $y = \frac{x^2 + 5x + 16}{5x - x^2 - 16}$, where x is a real number, then y lies in the interval:
Q28_OA	$\left[-4\frac{1}{3}, \frac{-3}{13}\right]$

Q28_OB	$\left[\frac{3}{13}, 4\frac{1}{3}\right]$
Q28_OC	$\left[-4\frac{1}{3}, 0\right]$
Q28_OD	$\left[\frac{3}{13}, 2\right]$
Q29	The number of distinct solutions of the equation $\left(5+2\sqrt{6}\right)^{x^2+2x} + \left(5-2\sqrt{6}\right)^{x^2+2x} = 10$ is:
Q29_OA	2
Q29_OB	1
Q29_OC	4
Q29_OD	3
Q30	The value of the determinant $\begin{vmatrix} 1 & k & k^2 \\ \cos(n-1)x & \cos nx & \cos(n+1)x \\ \sin(n-1)x & \sin nx & \sin(n+1)x \end{vmatrix}$ is zero if:
Q30_OA	sin x = 0 only
Q30_OB	cos x = 0 or sin x = $\frac{1+k}{2k}$
Q30_OC	cos x = $\frac{1+k^2}{2k}$ only
Q30_OD	sin x = 0 or cos x = $\frac{1+k^2}{2k}$
Q31	If A = $\begin{pmatrix} a & b \\ c & \frac{1}{a}+\frac{bc}{a} \end{pmatrix}$, then $aA^{-1} + aA$ is equal to:
Q31_OA	$(b^2+ca+1)I$
Q31_OB	$(a^2+bc+1)I$
Q31_OC	$(c^2+ab-1)I$
Q31_OD	$(a^2+bc-1)I$
Q32	$\lim_{x\to 0} \frac{1-\cos x\sqrt{\cos 2x}}{x^2}$ is equal to:
Q32_OA	$\frac{1}{2}$
Q32_OB	1
Q32_OC	$\frac{3}{2}$
Q32_OD	2
Q33	Let a be the value of f(0), for $f(x) = \left(1+\tan^2\sqrt{x}\right)^{\frac{1}{2x}}$ so that f(x) is continuous everywhere, then $\log_e a$ is equal to:
Q33_OA	$\frac{1}{2}$

Q33_OB	1
Q33_OC	0
Q33_OD	$\frac{1}{4}$
Q34	If $f(x) = x^2 \sin\frac{1}{x}$, for $x \neq 0$ $= 0$, for $x = 0$, Then which one of the following is not true?
Q34_OA	f(x) is continuous everywhere
Q34_OB	f(x) is differentiable everywhere
Q34_OC	$f'(0) = 0$
Q34_OD	$f'(x)$ is continuous at $x = 0$
Q35	The derivative of $[\log_{\cos x}(\sin x)]\ [\log_{\sin x}(\cos x)]^{-1}$ with respect to x at $x = \frac{\pi}{4}$ is:
Q35_OA	$4 / \log 2$
Q35_OB	$-4 / \log 2$
Q35_OC	$-8 / \log 2$
Q35_OD	$8 / \log 2$
Q36	The maximum value of the function $f(x) = \left(\frac{1}{x}\right)^x$ is:
Q36_OA	e
Q36_OB	$\frac{1}{e}$
Q36_OC	$e^{\frac{1}{e}}$
Q36_OD	$\left(\frac{1}{e}\right)^e$
Q37	The value of $e^{\int_0^{\pi/2} \theta^2 \operatorname{cosec}^2\theta\, d\theta}$ is:
Q37_OA	π
Q37_OB	2^π
Q37_OC	$\pi \log 2$
Q37_OD	$2 \log \pi$
Q38	$\int_0^1 \frac{5x^4 + 4x^5}{\left(1 + x + x^5\right)^2} dx$ is equal to:
Q38_OA	2
Q38_OB	3
Q38_OC	$\frac{1}{2}$
Q38_OD	$\frac{1}{3}$

Q39	If $I_n = \int_0^1 x^n e^{-x}\, dx, n \in N$, then the value of $I_7 - 7I_6$ is:
Q39_OA	e
Q39_OB	$-\frac{1}{e}$
Q39_OC	$-e$
Q39_OD	$\frac{1}{e}$
Q40	The value of $\int_0^{2\pi} \lvert\cos x\rvert dx - \int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \cos x\, dx$ is:
Q40_OA	2
Q40_OB	3
Q40_OC	4
Q40_OD	5
Q41	The area (in square units) bounded by the curves y = tan x for $\frac{-\pi}{3} \leq x \leq \frac{\pi}{3}$ and y = cot x for $\frac{\pi}{6} \leq x \leq \frac{3\pi}{2}$ and the x- axis is:
Q41_OA	$\frac{1}{2}\log 2$
Q41_OB	$\log 2$
Q41_OC	$\log \frac{1}{\sqrt{2}}$
Q41_OD	$\frac{1}{2} \log \frac{1}{\sqrt{2}}$
Q42	The vectors $\vec{a}, \vec{b}, \vec{c}$ are equal in length and pairwise make equal angles. If $\vec{a} = \hat{i} + \hat{j}$, $\vec{b} = \hat{j} + \hat{k}$ and $\vec{c}$ makes an obtuse angle with unit vector $\hat{i}$, then $\vec{c}$ is:
Q42_OA	$-\hat{i} + \frac{4}{3}\hat{j} - \frac{1}{3}\hat{k}$
Q42_OB	$\hat{i} + \frac{4}{3}\hat{j} + \frac{1}{3}k$
Q42_OC	$-\frac{1}{3}\hat{i} - \frac{4}{3}\hat{j} + \frac{1}{3}\hat{k}$
Q42_OD	$-\frac{1}{3}\hat{i} + \frac{4}{3}\hat{j} - \frac{1}{3}\hat{k}$
Q43	If $\vec{a}$ and $\vec{b}$ are two vectors such that $\lvert\vec{a} \times \vec{b}\rvert = \frac{\sqrt{2}+1}{\sqrt{2}-1}$, then the value of $[\vec{a}\ \vec{b}\ \vec{a} \times \vec{b}]$ equals:
Q43_OA	$3 - 2\sqrt{2}$
Q43_OB	$17 - 12\sqrt{2}$
Q43_OC	$17 + 12\sqrt{2}$
Q43_OD	$3 + 2\sqrt{2}$

Q44	If $\tan\frac{\theta}{2} = \operatorname{cosec}\theta - \sin\theta$, then the value of $\sec^2\frac{\theta}{2}$ is:
Q44_OA	$\sqrt{5}-1$
Q44_OB	$\sqrt{5}+1$
Q44_OC	$\sqrt{5}-2$
Q44_OD	$\sqrt{5}+2$
Q45	Which one of the following is not a solution of the equation $\sqrt{2}\sec\theta + \tan\theta = 1$?
Q45_OA	$\frac{15\pi}{4}$
Q45_OB	$\frac{9\pi}{4}$
Q45_OC	$\frac{-17\pi}{4}$
Q45_OD	$\frac{23\pi}{4}$
Q46	The value of $\frac{2\tan^{-1}\frac{1}{5}+\tan^{-1}\frac{1}{7}+2\tan^{-1}\frac{1}{8}}{\cos\left(\sin^{-1}\frac{1}{\sqrt{5}}+\cot^{-1}3\right)}$ is:
Q46_OA	$\frac{\pi}{4}$
Q46_OB	$\frac{1}{2}$
Q46_OC	$\frac{\sqrt{2}}{4}\pi$
Q46_OD	1
Q47	If $\cos 2\theta\cos\frac{\theta}{2} - \cos 3\theta\cos\frac{9\theta}{2} = \sin p\theta.\sin q\theta$, then the value of p + q is:
Q47_OA	4
Q47_OB	$2\frac{1}{2}$
Q47_OC	$7\frac{1}{2}$
Q47_OD	6
Q48	If $\frac{3\pi}{2} < \theta < 2\pi$ and $\tan\theta = \frac{-24}{7}$, then the value of $\sin\left(\frac{\theta}{2}\right) + \cos\left(\frac{\theta}{2}\right)$ is:
Q48_OA	$\frac{1}{5}$
Q48_OB	$-\frac{1}{5}$
Q48_OC	$\frac{3}{5}$
Q48_OD	$-\frac{4}{5}$
Q49	If $\tan\frac{\theta}{2} = \sqrt{\frac{1-e}{1+e}}\tan\frac{\phi}{2}$, then $\cos\phi\,(1-e\cos\theta)$ is equal to:

Q49_OA	$\sin\theta - e$
Q49_OB	$e - \sin\theta$
Q49_OC	$\cos\theta - e$
Q49_OD	$e - \text{cosec}\,\theta$
Q50	AB is a vertical pole, the end A being on the level ground. C is the midpoint of AB. CB subtends an angle β at P where P is a point on the level ground. If $\frac{AP}{AB} = n$, then β is equal to:
Q50_OA	$\tan^{-1}\left(\frac{n}{2n+1}\right)$
Q50_OB	$\cot^{-1}\left(\frac{n}{2n+1}\right)$
Q50_OC	$\cot^{-1}\left(\frac{1}{2n^2+1}\right)$
Q50_OD	$\tan^{-1}\left(\frac{1}{2n+n^{-1}}\right)$
Q51	Out of the following, which national song did Bankim Chandra Chattopadhyay compose?
Q51_OA	Sare Jahan Se Achha
Q51_OB	Vande Mataram
Q51_OC	Kadam Kadam Badhaye Jaa
Q51_OD	Jana gana mana adhinayaka jaya hey
Q52	Why is ‘Kalinga war’ considered very significant?
Q52_OA	Because Emperor won the war
Q52_OB	Because Emperor lost the war
Q52_OC	Because Emperor became dharmashok and preached Buddhism
Q52_OD	Because Emperor declared truce with the enemy
Q53	Who built the Ho Chi Minh trail during their war against the US?
Q53_OA	Vietnamese
Q53_OB	North Koreans
Q53_OC	Thai
Q53_OD	Cambodians
Q54	The eastern and western ghats mark the edges of the Deccan Plateau. What is true about the ghats?
Q54_OA	Western ghats are higher than Eastern ghats
Q54_OB	The elevation of both the ghats is equal
Q54_OC	Eastern ghats are higher than Western ghats
Q54_OD	Western ghats are discontinuous than Eastern ghats are in one stretch

Q55	What kind of winds are called as 'Loo'?
Q55_OA	Strong, hot dry winds blowing during summer over North India
Q55_OB	Stormy winds carrying dust
Q55_OC	Violent winds preceding rains
Q55_OD	Chilly winds of North Indian winters
Q56	In which state of India is the Gir Forest located?
Q56_OA	Maharashtra
Q56_OB	Gujarat
Q56_OC	Karnataka
Q56_OD	Kerala
Q57	Identify the incorrect statement. National Thermal Power Corporation (NTPC) preserves Natural resources and environment by:
Q57_OA	Ecological monitoring
Q57_OB	Reducing environmental pollution
Q57_OC	Minimizing waste generation
Q57_OD	Using old techniques and equipment
Q58	In 1992, the constitution was amended to make the number of tiers of Indian democracy into:
Q58_OA	2
Q58_OB	3
Q58_OC	4
Q58_OD	5
Q59	One feature of our constitution is that it:
Q59_OA	can be amended with an Act.
Q59_OB	can undergo no change at all.
Q59_OC	has to remain as it was framed by B.R. Ambedkar.
Q59_OD	can be amended but can take effect only from beginning of the year.
Q60	The sessions of the Rajya Sabha are presided over by the _____.
Q60_OA	Speaker
Q60_OB	President
Q60_OC	Prime Minister
Q60_OD	Vice President
Q61	Simplify: $\frac{115}{161}$

Q61_OA	$\frac{115}{161}$
Q61_OB	$\frac{5}{7}$
Q61_OC	$\frac{5}{14}$
Q61_OD	$\frac{10}{7}$
Q62	What is the HCF of 2500 and 3200?
Q62_OA	5
Q62_OB	10
Q62_OC	25
Q62_OD	100
Q63	What is the least number which when divided by 8, 6, 7 and 9 leaves a reminder of 5 in each case?
Q63_OA	509
Q63_OB	504
Q63_OC	499
Q63_OD	512
Q64	Rs 250 is divided between A and B in the ratio 14 : 11. The amount of money received by A and B respectively is:
Q64_OA	Rs 130 and Rs 120
Q64_OB	Rs 135 and Rs 115
Q64_OC	Rs 140 and Rs 110
Q64_OD	Rs 125 and Rs 125
Q65	If 8 cans costs Rs 1.20, then what is the cost of 40 cans?
Q65_OA	Rs 5
Q65_OB	Rs 6
Q65_OC	Rs 7
Q65_OD	Rs 8
Q66	The marked price of a toy is Rs 40. If a discount of 20% is given, then what is the selling price of the toy?
Q66_OA	Rs 32
Q66_OB	Rs 34
Q66_OC	Rs 30
Q66_OD	Rs 36
Q67	Assuming an average inflation rate of 8% compounded, what is the probable cost of a commodity in 10 years if its present cost is Rs 340?
Q67_OA	Rs 753

Q67_OB	Rs 272
Q67_OC	Rs 730
Q67_OD	Rs 734
Q68	What is the simple interest on Rs 1287 for 4.5 years at 6.3% per annum?
Q68_OA	Rs 346.80
Q68_OB	Rs 364.90
Q68_OC	Rs 369.40
Q68_OD	Rs 354.50
Q69	Saleem was standing in a long queue at the bus stop. He was 15 from either end. How many people were there in the queue?
Q69_OA	15
Q69_OB	20
Q69_OC	27
Q69_OD	29
Q70	A shopkeeper had 25 TV sets. All but six were sold out. How many TV sets were left?
Q70_OA	6
Q70_OB	8
Q70_OC	10
Q70_OD	12
Q71	If MART is coded as 2179 and SLIT is coded as 8539, how will TRAIL be coded?
Q71_OA	97135
Q71_OB	91735
Q71_OC	97153
Q71_OD	97351
Q72	If TRAM is coded as 9712 and MORE is coded as 2475, how will MATRO be coded?
Q72_OA	21794
Q72_OB	21479
Q72_OC	21974
Q72_OD	21947
Q73	In a language, if SURF is coded as UWTH and PROM is coded as RTQO, how will FROND be coded in that language?
Q73_OA	HTPQF
Q73_OB	HTQPF
Q73_OC	THQPF
Q73_OD	HTPFQ
Q74	If a language codes BEAN as FIER and TRAP as XVET, how will it code

	PRINT?
Q74_OA	TVMRX
Q74_OB	TVRXM
Q74_OC	TVMXR
Q74_OD	VTRMX
Q75	Stephen walked 15 metres to the east, turned north and walked for 12 metres. Then he turned west and walked for 20 metres. From there he walked south for 12 metres. How far was he from where he had started?
Q75_OA	3 metres
Q75_OB	5 metres
Q75_OC	8 metres
Q75_OD	12 metres