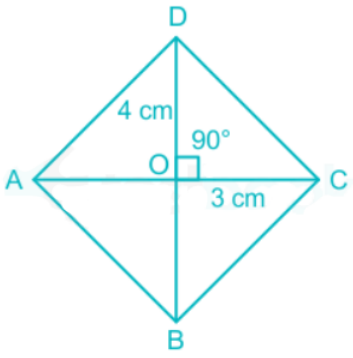
Question	If the sides of a triangle are 26 cm, 24 cm and 10 cm, what is its area?	
Type	multiple_choice	
Option	130	incorrect
Option	140	incorrect
Option	132	incorrect
Option	120	correct
Solution	The triangle given is right-angled where the hypotenuse is 26 cm. Therefore the area is ½ X 24 X 10 = 120 cm2	
Marks	4	1

Question	The ratio of the length and the breadth of a rectangle is 4 : 3 and the area of the rectangle is 6912 sq cm. Find the ratio of the breadth and the area of the rectangle?	
Type	multiple_choice	
Option	1:86	incorrect
Option	1:48	incorrect
Option	1:96	correct
Option	1:68	incorrect
Solution	$\textit{Let the length and the breadth of the rectangle be } 4x \textit{ cm and } 3x \textit{ respectively.}$ $(4x) \times (3x) = 6912$ $12x^2 = 6912$ $x^2 = 576 = 4 \times 144 = 2^2 \times 12^2 (x > 0)$ $\Rightarrow x = 2 \times 12 = 24$ $\textit{Ratio of the breadth and the areas} = 3x : 12x^2 = 1 : 4x = 1 : 96.$	
Marks	4	1

Question	Find the length of one side of a rhombus whose area is 24 cm2 and the sum of the lengths of its diagonals is 14 cm.	
Type	multiple_choice	
Option	4 cm	incorrect
Option	6 cm	incorrect
Option	5 cm	correct
Option	3 cm	incorrect
Solution	Area of the rhombus = 24 cm^2 Sum of the lengths of its diagonals = 14 cm **Concept used:** The diagonals of a rhombus always bisect each other at an angle of 90°. Area of a rhombus = $\frac{1}{2}\times$ Product of its diagonals $(a + b)^2 = (a - b)^2 + 4ab$ **Calculation:** Let, the length of the diagonals of the rhombus be P and Q respectively. (Where P > Q) 	

	According to the concept, PQ/2 = 24 ⇒ PQ = 48 According to the question, P + Q = 14 ---(1) ⇒ $(P + Q)^2$ = 196 ⇒ $(P - Q)^2$ + 4PQ = 196 ⇒ $(P - Q)^2$ = 196 - 4PQ Putting the value of PQ in the equation, ⇒ $(P - Q)^2$ = 196 - 4 × 48 ⇒ $(P - Q)^2$ = 196 - 192 ⇒ $(P - Q)^2$ = 4 ⇒ (P - Q) = ± 2 ⇒ (P - Q) = 2 [∵ P > Q, taking +2] ---(2) Adding equation (1) and (2), we get, P + Q + P - Q = 14 + 2 ⇒ 2P = 16 ⇒ P = 8 cm So, Q = 8 - 2 = 6 cm According to the concept, ΔCOD is a right-angled triangle at O. So, DO = OB = 8/2 = 4 cm AO = OC = 6/2 = 3 cm Now, DC = $\sqrt{4^2 + 3^2}$ = 5 cm	
Marks	4	1

Question	The curved surface area and circumference of the base of a solid right circular cylinder are 2200 cm2 and 110 cm, respectively. Find the height of the cylinder.	
Type	multiple_choice	
Option	20 cm	correct
Option	24 cm	incorrect
Option	12 cm	incorrect
Option	18 cm	incorrect
Solution	Base of a solid cylinder = $2\pi r = 110$cm The curved surface area of cylinder = 2200cm2 $\Rightarrow 2\pi rh = 2200$ $\Rightarrow 110 \times h = 2200$ $\Rightarrow h = 2200/110 = 20$cm	
Marks	4	1

Question	The heights of two right circular cones are in the ratio 1 : 5 and the perimeter of their bases are in the ratio 5 : 3. Find the ratio of their volumes.	
Type	multiple_choice	
Option	5:9	correct

Option	9:11	incorrect
Option	9:5	incorrect
Option	8:11	incorrect
Solution	**Given:** The heights of the two right circular cones are in the ratio 1 : 5 Ratio of the perimeter of their bases 5 : 3 **Formula Used:** Volume of right circular cone = $\frac{1}{3}\pi r^2 h$ Perimeter of the base of cone = $2\pi r$ Where, r = radius of the cone h= height of the cone **Calculation:** Here, let us take the height of the two circular cones h_1 and h_2 respectively Also, their perimeter of bases be p_1 and p_2 respectively Now, we have $\frac{h_1}{h_2} = \frac{1}{5}$ and $\frac{p_1}{p_2} = \frac{5}{3}$ $\Rightarrow 2\pi r_1 : 2\pi r_2 = 5 : 3$ $\Rightarrow \frac{r_1}{r_2} = \frac{5}{3}$ Now, ratio of volume of the cones $\Rightarrow \frac{1}{3}\pi r_1^2 h_1 : \frac{1}{3} r_2^2 h_2$ $\Rightarrow r_1^2 h_1 : r_2^2 h_2 \Leftrightarrow \frac{r_1^2}{r_2^2} : \frac{h_2}{h_1}$ $\Rightarrow \frac{5^2}{3^2} : \frac{5}{1} \Leftrightarrow \frac{25}{9} : 5$ $\Rightarrow 5 : 9$ **Hence, the ratio of volume of the cones is 5 : 9.**	
Marks	4	1

Question	A solid metallic sphere of radius 12 cm is melted and recast in the form of small spheres of radius 2 cm. How many small spheres are formed?	
Type	multiple_choice	
Option	96	incorrect
Option	216	correct
Option	225	incorrect
Option	84	incorrect
Solution	Radius of the main sphere = 12 cm Radius of the small sphere = 2cm Concept used: Volume of a Sphere of radius R unit = $(4/3) \times \pi \times R3$ cube units Calculation: Let the number of small spheres be N. According to the question, $(4/3) \times \pi \times 123 = (4/3) \times \pi \times 23 \times N$ $\Rightarrow N = 63$ $\Rightarrow N = 216$	
Marks	4	1

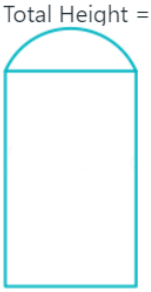
Question	There is a cement block in the shape of a cuboid, the size of cuboid is 117 cm x 72 cm x 45 cm, How many 9 cm cubes can be a cut from a cuboid and find the total surface area of a cube.

Type	multiple_choice	
Option	420, 489 cm2	incorrect
Option	520, 494 cm2	incorrect
Option	620, 482 cm2	incorrect
Option	520, 486 cm2	correct
Solution	Given: Dimension of cuboid = 117 cm × 72 cm × 45 cm Side of a cube = 9 cm Formula used: Volume of the cuboid = (l × b × h) Where, l = length, b = width, h = height Volume of cube = (side)^3 Total surface area of cube = 6 × (side)^2 Calculation: Let the number of cubes be n Volume of cuboid = n × volume of cube ⇒ 117 x 72 × 45 = n × (9)^3 ⇒ n = 13 × 8 × 5 ⇒ n = 520 Total surface area of one cube = 6 × (side)^2 ⇒ Total surface area of one cube = 6 × (9)^2 ⇒ Total surface area of one cube = 486 cm2 ∴ The number of cubes and the total surface area of a cube are 520 and 486 cm2.	
Marks	4	1

Question	The length, breadth and height of a cuboid are in the ratio of 6 : 4 : 3. If the total surface area of the cuboid is 972 cm2, what is the length (in cm) of the diagonal of the cuboid?	
Type	multiple_choice	
Option	3√61	correct
Option	5√61	incorrect
Option	3√65	incorrect

Option	$9\sqrt{65}$	incorrect
Solution	Total surface area of a cuboid = 2(lb + bh + hl), where l = length, b = breadth, and h = height. Length of the diagonal of a cuboid, d = $\sqrt{(l^2 + b^2 + h^2)}$. **Calculation:** Let the common multiple be x. Then, l = 6x, b = 4x, and h = 3x. $\Rightarrow$ Total surface area = 2[(6x×4x) + (4x×3x) + (6x×3x)] $\Rightarrow 972 = 2[(24x^2) + (12x^2) + (18x^2)]$ $\Rightarrow 972 = 2[54x^2]$ $\Rightarrow 972 = 108x^2$ $\Rightarrow x^2 = 972 / 108$ $\Rightarrow x^2 = 9$ $\Rightarrow x = 3$ So, l = 18 cm, b = 12 cm, and h = 9 cm. Now, $d = \sqrt{(l^2 + b^2 + h^2)}$ $\Rightarrow d = \sqrt{[(18)^2 + (12)^2 + (9)^2]}$ $\Rightarrow d = \sqrt{(324 + 144 + 81)}$ $\Rightarrow d = \sqrt{549}$ $\Rightarrow d = 3\sqrt{(61)}$	
Marks	4	1

Question	A vessel is in the form of a hollow hemisphere mounted on a hollow cylinder. The diameter of the hemisphere is 28 cm and the total height of the vessel is 26 cm, find the surface area of the vessel (Take π = 22/7)	
Type	multiple_choice	
Option	2828 cm2	incorrect
Option	2288 cm2	correct

Option	2200 cm2	incorrect
Option	2450 cm2	incorrect
Solution	**Calculation:** Radius of hemisphere = 14 cm Height of the vessel = 26 cm Curved surface area of hemisphere = $2 \times \pi \times \text{radius}^2$ $\Rightarrow 2 \times (22/7) \times 14 \times 14 = 1232\ \text{cm}^2$ Total Height = 26 cm  Height of the of the cylinder = 26 – radius of hemisphere = 26 – 14 = 12 cm Curved surface of the cylinder = $2\ \pi \times$ radius × height $\Rightarrow 2 \times (22/7) \times 14 \times 12 = 1056$ Surface area of vessel = Curved surface of the hemisphere + Curved of the cylinder $\Rightarrow 1056 + 1232 = 2288\ \text{cm}^2$	
Marks	4	1

Question	Two plates with diameters 3.5 cm and 2.5 cm are kept one above the other. The larger plate is placed at the bottom. What is the total area of the larger plate in sq. cm that is visible?	
Type	multiple_choice	
Option	1.5 π	correct
Option	2.5 π	incorrect
Option	π	incorrect
Option	2 π	incorrect

Solution	**Given:** Diameter of bigger plate = 3.5 cm Diameter of smaller plate = 2.5 cm **Formula used:** Surface area of plate = π × radius^2 = π × diameter^2 / 4 Calculation: ⇒ π {$(3.5)^2$ - $(2.5)^2$} / 4 ⇒ π {6} / 4 ⇒ 1.5 π	
Marks	4	1

Question	The diameter of a copper sphere is 12 cm. The sphere is melted and is draw into a long wire of uniform circular cross-section. If the length of wire is 48 cm, find its diameter.	
Type	multiple_choice	
Option	3√6 cm	incorrect
Option	5√6 cm	incorrect
Option	6√6 cm	incorrect
Option	2√6 cm	correct

Solution	**Given:** Diameter of sphere = 12 cm Length of wire = 48 cm **Formula used:** Volume of sphere = $(4 / 3)\pi \times \text{radius}^3$ Volume of cylinder = $\pi \times \text{radius}^2 \times \text{height}$ **Calculation:** According to question Volume of cylinder (wire) = volume of sphere $\Rightarrow \pi \times \text{radius}^2 \times 48 = (4 / 3) \times \pi \times 6 \times 6 \times 6$ $\Rightarrow \text{radius}^2 = (4 \times 6 \times 6 \times 6) / 3 \times 48$ $\Rightarrow \text{radius}^2 = 6$ $\Rightarrow$ Radius = $\sqrt{6}$ cm Diameter = 2 × radius $\therefore$ Diameter of cylinder (wire) = $2\sqrt{6}$ cm	
Marks	4	1

Question	A farmer wants to fence his rectangular field of length 200 m and area 3000 m2. If the cost of fencing per metre is 5 rupees, what is the total cost of fencing in rupees?	
Type	multiple_choice	
Option	2100	incorrect
Option	2150	correct
Option	2200	incorrect
Option	4300	incorrect

Solution	**Given:** Length of the field = 200 m Area of the field = 3000 m^2 Cost of fencing per metre = Rs. 5 **Formula Used:** P = 2 × (length + breadth) Area of rectangular field = (length × breadth) **Calculation:** Using the above formulae, we get ⇒ 3000 = (200 × breadth) ⇒ Breadth = 15 m ⇒ P = 2 × (200 + 15) ⇒ P = 430 m ⇒ The total cost of fencing = 430 × 5 = Rs. 2150 ∴ Required cost of fencing = Rs. 2150	
Marks	4	1

Question	**The height, length and width of a cuboidal box are 20 cm, 15 cm and 10 cm, respectively. Find its area.**	
Type	multiple_choice	
Option	900	incorrect
Option	1500	incorrect
Option	1000	incorrect
Option	1300	correct
Solution	Solution: Total surface area = 2 (20 × 15 + 20 × 10 + 10 × 15) TSA = 2 (300 + 200 + 150) = 1300 cm^2	

Marks	4	1

Question	**An order was placed for the supply of a carpet whose length and breadth were in the ratio of 3 : 2. Subsequently, the dimensions of the carpet were altered such that its length and breadth were in the ratio 7 : 3 but were was no change in its perimeter. Find the ratio of the areas of the carpets in both the cases.**	
Type	multiple_choice	
Option	8:7	correct
Option	9:8	incorrect
Option	4:3	incorrect
Option	7:8	incorrect
Solution	*Let the length and breadth of the carpet in the first case be* $3x$ *units and* $2x$ *units respectively.* *Let the dimensions of the carpet in the second case be* $7y,\ 3y$ *units respectively.* *From the data,.* $2(3x+2x) = 2(7y+3y)$ $\Rightarrow \quad 5x = 10y$ $\Rightarrow \quad x = 2y$ *Required ratio of the areas of the carpet in both the cases* $= 3x \times 2x : 7y \times 3y$ $= 6x^2 : 21y^2$ $= 6 \times (2y)^2 : 21y^2$ $= 6 \times 4y^2 : 21y^2$ $= 8 : 7$	
Marks	4	1

Question	The percentage increase in the area of a rectangle, if each of its sides is increased by 20% is:

Type	multiple_choice	
Option	42%	incorrect
Option	44%	correct
Option	40%	incorrect
Option	42%	incorrect
Solution	$Let\ original\ length\ =\ x\ metres\ and\ original\ breadth\ =\ y\ metres.$ $Original\ area\ =\ \left(xy\right)\ m^2.$ $New\ length\ =\ \frac{120}{100}\times x\ m=\frac{6}{5}\times x\ m.$ $New\ breadth\ =\ \frac{120}{100}\times y\ m=\frac{6}{5}ym.$ $New\ Area\ =\ \left(\frac{6}{5}\right)x\times\left(\frac{6}{5}\right)y\ =\ \left(\frac{36}{25}\right)xy.$ $The\ difference\ between\ the\ original\ area\ =\ xy$ $and\ new\ area\ \frac{36}{25}xy\ is=\ \left(\frac{36}{25}\right)xy-xy$ $=\ xy\left(\frac{36}{25}-1\right)$ $=\ xy\left(\frac{11}{25}\right)\ or\ \left(\frac{11}{25}\right)xy$ $Increase\ \%\ =\ \left(\frac{\left(\frac{11}{25}\right)xy}{(xy)}\right)\times100\ \%\ =\ 44\%.$	
Marks	4	1

Question	50 men took a dip in a water tank 40 m long and 20 m broad on a religious day. If the average displacement of water by a man is 4 cubic meter , then the rise in the water level in the tank will be:	
Type	multiple_choice	
Option	22 cm	incorrect
Option	20 cm	incorrect
Option	25 cm	correct
Option	30 cm	incorrect

Solution	$Total\ volume\ of\ water\ displaced\ =\ \left(4\times 50\right)m^3\ =\ 200m^3.$ $Rise\ in\ water\ level\ =\ \frac{200}{40}\times 20m\ =\ 0.25m\ =\ 25cm.$	
Marks	4	1

Question	If a circle and a square have the same area, then what will be the perimeter of the square, if the diameter of the circle is 8 cm.	
Type	multiple_choice	
Option	$16\sqrt{\pi}$	correct
Option	$12\sqrt{\pi}$	incorrect
Option	$15\sqrt{\pi}$	incorrect
Option	$20\sqrt{\pi}$	incorrect
Solution	$We\ know, Area\ of\ circle\ =\ Area\ of\ Square.$ $\pi R^2\ =\ \left(side\right)^2$ $Side\ =\ \sqrt{(\pi)}\times R$ $=\ \sqrt{(\pi)}\times \frac{Diameter}{2}\ =\ 4\sqrt{(\pi)}$ $Perimeter\ of\ square\ =\ 4\times side\ =\ 16\sqrt{(\pi)}$	
Marks	4	1

Question	Poles are to be created along the boundary of a rectangular field in such a way that distance between any two adjacent poles is 1.5 metres. The perimeter of the field is 21 metres and length and the breadth are in the ratio of 4:3 respectively. How many poles will be required?
Type	multiple_choice

Option	14	correct
Option	16	incorrect
Option	12	incorrect
Option	10	incorrect
Solution	*Let the length and breadth be $4x$ and $3x$ metres respectively.* $2\left(4x+3x\right) = 21$ $\Rightarrow \quad 14x = 21$ $\Rightarrow \quad x = \frac{21}{14} = 1.5$ $Length = 6m \text{ and } Breadth = 4.5m.$ *So number of poles* $= 14$	
Marks	4	1

Question	Find the length of the longest pole that can be placed in a room 12 m long, 8m broad and 9 m high.	
Type	multiple_choice	
Option	17 m	correct
Option	15 m	incorrect
Option	10 m	incorrect
Option	20 m	incorrect
Solution	*The length of the longest pole can be calculated by calculating the value of the diagonal of a room which is considered to be in the shape of a cuboid.* *Hence, The Diagonal of the cuboid* $= \sqrt{l^2+b^2+h^2}$ $= \sqrt{122+82+92}$ $= \sqrt{289} = 17m.$	
Marks	4	1

Question	If the radius of a cylinder is doubled and the height remains same, the volume will be

Type	multiple_choice	
Option	4 times	correct
Option	5 times	incorrect
Option	2 times	incorrect
Option	6 times	incorrect
Solution	$If\ r\ be\ the\ radius\ and\ h\ be\ the\ height,\ then\ volume\ =\ \pi r^2 h.$ $If\ radius\ is\ doubled\ and\ height\ remain\ same,$ $The\ volume\ will\ be\ =\ \pi(2r)^2 h$ $= \pi \times 4r^2 h$ $= 4\pi r^2 h$ $= 4 \times Volume.$ $The\ volume\ is\ four\ times\ more\ than\ the\ original\ volume.$	
Marks	4	1

Question	If the sum of the interior angles of a regular polygon measures up to 144 degrees, how many sides does the polygon have?	
Type	multiple_choice	
Option	14	incorrect
Option	8	incorrect
Option	12	incorrect
Option	10	correct
Solution	$Exterior\ angle\ =\ 180 - Interior\ angle\ =\ 180 - 144\ =\ 36.$ $Total\ sum\ of\ the\ exterior\ angles\ of\ a\ polygon\ =\ 360^\circ.$ $Therefore\ no.\ of\ sides\ N\ =\ \frac{360}{36}\ =\ 10.$ $It's\ a\ decagon.$ $Aliter\ :$ $A\ polygon\ with\ N\ sides\ will\ have\ the\ sum\ of\ the\ interior\ angles\ =\ \left(2N-4\right) \times right\ angles.$ $\therefore\ \ 144N\ =\ \left(2N-4\right) \times 90$ $144N - 180N\ =\ -360$ $36N\ =\ 360$ $N\ =\ 10$ $It's\ a\ polygon\ with\ 10\ sides.$	
Marks	4	1

Question	A polygon has 27 diagonals. The number of sides of the polygon is	
Type	multiple_choice	
Option	10	incorrect
Option	9	correct
Option	11	incorrect
Option	12	incorrect
Solution	*We know that,* *Number of diagonals of a polygon* $= \frac{n(n-3)}{2}$ *According to the question,* $\frac{n(n-3)}{2} = 27$ $n\left(n-3\right) = 54$ $n^2 - 3n - 54 = 0$ $n^2 \times 9n + 6n - 54 = 0$ $n\left(n9\right) + 6\left(n9\right) = 0$ $\left(n+6\right)\left(n-9\right) = 0$ $n = 9, -6\left(Neglecting\ negative\ value\right) n = 9.$ *Hence, sides of polygon are* 9.	
Marks	4	1

Question	Consider Square S inscribed in circle C, what is the ratio of the areas of S and C? And, Consider Circle Q inscribed in Square S, what is the ratio of the areas of S and Q?	
Type	multiple_choice	
Option	2:π, 4:π	correct
Option	2:π, 1:π	incorrect
Option	4:π, 2:π	incorrect

Option	1:π, 2:π	incorrect
Solution	*Go about it by focussing on the radius of the Circle or the side of the Square.* *If square is inside the circle, ratio of areas of square to that of circle is* $2 : \pi$. *If circle is inside square, ratio of areas of square to that of circle is* $4 : \pi$. *Remember, circle area goes with* π*, square area goes with number.* *The question is " What is the ratio of the areas of S and C? and what is the ratio of the areas of S and Q? "* *Hence, the answer is* $2 : \pi$, $4 : \pi$.	
Marks	4	1

Question	A rectangular piece of dimension 22 cm x 7 cm is used to make a circle of the largest possible radius. Find the area of the circle formed.	
Type	multiple_choice	
Option	38.50	correct
Option	39.50	incorrect
Option	37.50	incorrect
Option	40.50	incorrect
Solution	In questions like this, the diameter of the circle is lesser in length and breadth. Here, the breadth Diameter of the circle = 7 cm => Radius of the circle = 3.5 cm Therefore, area of the circle = π (Radius)^2 = π (3.5)^2 = 38.50 cm2	
Marks	4	1

Question	Find the area of the largest square that can be inscribed in a circle of radius ‘r’.

Type	multiple_choice	
Option	8 r^2	incorrect
Option	4 r^2	incorrect
Option	(2)^½ r^2	incorrect
Option	2 r^2	correct
Solution	The largest square that can be inscribed in the circle will have the diameter of the circle as the diagonal of the square. => Diagonal of the square = 2 r => Side of the square = 2 r / (2)^1/2 => Side of the square = (2)^1/2 r Therefore, area of the square = Side^2 = [(2)^1/2 r]^2 = 2 r^2	
Marks	4	1