National Testing Agency

Question Paper Name :	JEE Main 2021 Paper 2B (B.Planning) Sep 9 Shift 2
Subject Name :	Paper 2B (B.Planning)
Duration :	180
Total Marks :	400

Paper 2B (B.Planning)

Mathematics Section A

Section Number :	1
Number of Questions :	20
Number of Questions to be attempted :	20
Section Marks :	80

Question Number : 1 Question Id : 6760337732 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

The domain of the function

$$f(x)=\frac{\sqrt{2x-1}}{\sqrt{3-4x}\sqrt{4-5x}}\cdot\log_{12}\left(\frac{x+3}{x+5}\right) \text{ is}$$

Options :

1. $\left[\frac{1}{2},\frac{3}{5}\right]$

2. $\left[\frac{1}{2},\frac{4}{5}\right)$

3. $\left(\frac{1}{2},\frac{7}{8}\right)$

4. $\left[\frac{1}{2},\frac{3}{4}\right)$

Question Number : 2 Question Id : 6760337733 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

If $\alpha,\beta\in\mathbb{C}$ are the distinct roots of the equation $x^2+\left(\sqrt{2}\right)x+2=0$, then $\alpha^{11}+\beta^{11}$ is equal to

Options :

1. 16

2. $-16\sqrt{2}$

3. $32\sqrt{2}$

4. $-32\sqrt{2}$

Question Number : 3 Question Id : 6760337734 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

If $A = \begin{bmatrix} a_1 & a_2 & a_3 \\ a_4 & a_5 & a_6 \\ a_7 & a_8 & a_9 \end{bmatrix}$ where $a_1, a_2, a_3, \ldots$ form a G.P. with common ratio $r > 1$, then the entries in each column of A^5 from a G.P. with common ratio

Options :

1. r

2. r^2

3. r^3

4. r^5

Question Number : 4 Question Id : 6760337735 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

If the system of linear equations

$2x+3y-2z=0\,;\,2x-y+3z=0\,;\,7x+\lambda y-z=0$ has a non-zero solution (x, y, z), then $\frac{xz}{y^2}$ is equal to

Options :

1. $\frac{-7}{8}$

2. $\frac{5}{4}$

3. $\frac{-14}{25}$

4. $\frac{5}{16}$

Question Number : 5 Question Id : 6760337736 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

The value of ${}^{40}C_{31} + \sum_{r=0}^{10} {}^{40+r}C_{10+r}$ is equal to

Options :

1. ${}^{51}C_{20}$

2. ${}^{50}C_{20}$

3. $2\cdot{}^{45}C_{15}$

4. ${}^{50}C_{19}$

Question Number : 6 Question Id : 6760337737 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

If A is the sum of even terms and B that of odd terms in the G.P.

$8, 4\sqrt{3}, 6, 3\sqrt{3}, \ldots$ having 31 terms, then $\frac{A}{B}$ is equal to

Options :

1. $\frac{2\sqrt{3}\left(4^{16}-3^{16}\right)}{4^{15}-3^{15}}$

2. $\frac{4\left(4^{16}-3^{16}\right)}{4^{15}-3^{15}}$

3. $\frac{4\left(4^{15}-3^{15}\right)}{4^{16}-3^{16}}$

4. $\frac{2\sqrt{3}\left(4^{15}-3^{15}\right)}{4^{16}-3^{16}}$

Question Number : 7 Question Id : 6760337738 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Let $g = f^{-1}$ and $f'(x) = \frac{1}{1+x^3}$, $0 < x < 1$. Then $g'(x)$ is equal to

Options :

1. $\left(1+\left(f(x)\right)^3\right)^{-1}$

2. $\left(1+\left(g(x)\right)^3\right)^{-1}$

3. $1+\left(g(x)\right)^3$

4. $1+\left(f(x)\right)^3$

Question Number : 8 Question Id : 6760337739 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

If tangents are drawn from (0, 0) to the curve $y = \cos x$, then the points of contact of the tangents lie on the curve

Options :

1. $x^2 - y^2 = x^2y^2$

2. $x^2 + y^2 = x^2y^2$

3. $y^2 - x^2 = x^2y^2$

4. $\left(1+x^2\right)y^2 = \left(1-y^2\right)x^2$

Question Number : 9 Question Id : 6760337740 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

If one ant is moving along the curve $y = x^2$ and the other stays at the point (0, 1), then the shortest distance between the two ants is

Options :

1. $\sqrt{2}$

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

3. 1

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

Question Number : 10 Question Id : 6760337741 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

The integral $\int\frac{-4\sin x+5\sin(2x)}{6\sin x-5\sin(2x)}dx$ is equal to

(where C is a constant of integration)

Options :

1. $-x+\frac{1}{2}\log_e\left|\frac{2\sin\frac{x}{2}-\cos\frac{x}{2}}{2\sin\frac{x}{2}+\cos\frac{x}{2}}\right|+C$

2. $-x+\frac{1}{2}\log_e\left|\frac{\sin\frac{x}{2}-\cos\frac{x}{2}}{\sin\frac{x}{2}+\cos\frac{x}{2}}\right|+C$

3. $-x+\frac{1}{4}\log_e\left|\frac{2\sin\frac{x}{2}-\cos\frac{x}{2}}{2\sin\frac{x}{2}+\cos\frac{x}{2}}\right|+C$

4. $-x+\frac{1}{4}\log_e\left|\frac{\sin\frac{x}{2}-\cos\frac{x}{2}}{\sin\frac{x}{2}+\cos\frac{x}{2}}\right|+C$

Question Number : 11 Question Id : 6760337742 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

The value of $\frac{\int_0^1\left(1-x^3\right)^4dx}{\int_0^1\left(1-x^3\right)^3dx}$ is

Options :

1. $\frac{20}{21}$

2. $\frac{21}{20}$

3. $\frac{12}{13}$

4. $\frac{13}{12}$

Question Number : 12 Question Id : 6760337743 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

The solution of the differential equation,

$\frac{dy}{dx} = \frac{\sqrt{1-y^2}}{y}$ which satisfies $y(0) = 1$, is

Options :

1. $x - \sqrt{1-y^2} = 0$

2. $x + \sqrt{1-y^2} = 0$

3. $y - \sqrt{1-x^2} = 0$

4. $2x - \sqrt{1-y^2} = 0$

Question Number : 13 Question Id : 6760337744 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

If two vertices of a ΔABC are A(1, 1) and B(2, 3) and its area is 3 sq. units, then the locus of the third vertex of such triangles which lie above the line AB, is

Options :

1. $2x - y + 5 = 0$

2. $2x + y - 5 = 0$

3. $2x - y - 7 = 0$

4. $2x - y + 7 = 0$

Question Number : 14 Question Id : 6760337745 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

The distance of the point (7, 1) from the focus of the parabola $x^2 - 8x + 16y = 0$ is

Options :

1. 4

2. 5

3. 6

4. 8

Question Number : 15 Question Id : 6760337746 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

If the line $\alpha x + \beta y = 1$ touches the ellipse $a^2x^2 + b^2y^2 = 1$, then the locus of the point $\left(\frac{\alpha}{2}, \frac{\beta}{2}\right)$ is

Options :

1. $\frac{x^2}{a^2}+\frac{y^2}{b^2}=\frac{1}{2}$

2. $\frac{x^2}{a^2}+\frac{y^2}{b^2}=\frac{1}{4}$

3. $\frac{x^2}{a^2}-\frac{y^2}{b^2}=\frac{1}{2}$

4. $a^2x^2+b^2y^2=\frac{1}{4}$

Question Number : 16 Question Id : 6760337747 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

The image of the point (–1, 0, 0) in the plane, $x - y + z + 3 = 0$ lies on the plane

Options :

1. $3x - 3y - 3z + 7 = 0$

2. $3x - 3y - 3z + 4 = 0$

3. $6x - 3y - 3z + 7 = 0$

4. $6x + 3y - 3z + 4 = 0$

Question Number : 17 Question Id : 6760337748 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Let $x_1, x_2, \ldots, x_n$ be n observations and let $w_i = lx_i + k$ ($i = 1, 2, \ldots, n$), where k and l ($l > 0$) are some constants. If the ordered pairs (mean, standard deviation) of x_i's and w_i's are (48, 12) and (55, 15) respectively, then $\frac{k}{l}$ equals

Options :

1. -4

2. -2

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

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

Question Number : 18 Question Id : 6760337749 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

If x, y and z are the lengths of the perpendiculars drawn from circumcentre of a ΔABC to its sides BC, CA and AB respectively and $\frac{a}{x}=\alpha, \frac{b}{y}=\beta, \frac{c}{z}=\gamma$, where a, b and c are the lengths of the sides BC, CA and AB respectively ; then $\frac{3\alpha\beta\gamma}{\alpha+\beta+\gamma}$ is equal to

Options :

1. 3

2. 6

3. 12

4. 18

Question Number : 19 Question Id : 6760337750 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Let $f(x)=\sin\left[\cot^{-1}\left\{\cos\left(\tan^{-1}x\right)\right\}\right]$ be a function defined on the real line. Then the value of $f\left(\frac{\pi}{e}\right)$ is

Options :

1. $\frac{\pi^2-e^2}{\pi^2+2e^2}$

2. $\sqrt{\frac{\pi^2+e^2}{\pi^2+2e^2}}$

3. $\sqrt{\frac{\pi^2-e^2}{2\pi^2-e^2}}$

4. $\frac{\pi^2e^2}{\pi^2+2e^2}$

Question Number : 20 Question Id : 6760337751 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

The Boolean expression $(\sim p \vee q) \wedge (p \vee \sim q)$ is equivalent to

Options :

1. $p \Rightarrow q$

2. $q \Rightarrow p$

3. $(p \Rightarrow q) \vee (q \Rightarrow p)$

4. $(p \Rightarrow q) \wedge (q \Rightarrow p)$

Mathematics Section B

Section Number :	2
Number of Questions :	10
Number of Questions to be attempted :	5
Section Marks :	20

Question Number : 21 Question Id : 6760337752 Question Type : SA Correct Marks : 4 Wrong Marks : 0

The total number of solutions $\{(x, y) : x, y \in \mathbb{R}\}$, for which the complex numbers $3 + ix^2y$ and $x^2 - y - 4i$ are conjugate of each other, is _____.

Question Number : 22 Question Id : 6760337753 Question Type : SA Correct Marks : 4 Wrong Marks : 0

If $\begin{vmatrix} x-3 & 4x & 4x \\ 4x & x-3 & 4x \\ 4x & 4x & x-3 \end{vmatrix} = 3(Ax - B)(Ax + 3B)^2$, then $(A + B)(A - B)$ is equal to _____.

Question Number : 23 Question Id : 6760337754 Question Type : SA Correct Marks : 4 Wrong Marks : 0

If A and B are respectively the coefficients of x^{14} and $\frac{1}{x^{16}}$ in the expansion of $\left(2x - \frac{1}{2x}\right)^{20}$ and $AB = k\,2^m$; where k is an odd integer, then m is equal to _____.

Question Number : 24 Question Id : 6760337755 Question Type : SA Correct Marks : 4 Wrong Marks : 0

The sum of the remainders when $S = 3 + 6 + 12 + \ldots + 3 \cdot 2^{19}$ is divided by 3, 4, 5 and 6 is _____.

Question Number : 25 Question Id : 6760337756 Question Type : SA Correct Marks : 4 Wrong Marks : 0

If for a real function f, $f(1) = 3$ and $f'(1) = 1$, then $\lim\limits_{x \to 1} \frac{3e^{(x-1)} - f(x)}{(x-1)}$ is equal to _____.

Question Number : 26 Question Id : 6760337757 Question Type : SA Correct Marks : 4 Wrong Marks : 0

If the area of the region bounded by the curves, $y = 1 + \frac{1}{2}|2x - a|$, $x = -3$, $x = 3$, $y = 0$, where $a \in (-3, 3)$, is 16 square units, then a^2 is equal to _____.

Question Number : 27 Question Id : 6760337758 Question Type : SA Correct Marks : 4 Wrong Marks : 0

If PA and PB are the tangents to the circle, $x^2 + y^2 = 13$, drawn from a point $P\left(\frac{13}{5}, \frac{13}{5}\right)$ and A and B are the points of contact, then $(AB)^6$ is equal to _____.

Question Number : 28 Question Id : 6760337759 Question Type : SA Correct Marks : 4 Wrong Marks : 0

The distance of the point of intersection of the lines $\frac{x}{-1} = \frac{y-1}{-1} = \frac{z}{1}$ and $\frac{x}{1} = \frac{y}{2} = \frac{z-1}{-2}$ from the plane $2x - y + 2z = 7$ is _____.

Question Number : 29 Question Id : 6760337760 Question Type : SA Correct Marks : 4 Wrong Marks : 0

Let $\vec{a}=2\hat{i}-7\hat{j}-9\hat{k}$, $\vec{b}=3\hat{i}+8\hat{j}+10\hat{k}$, $\vec{c}=t\hat{i}+\hat{j}+\hat{k}$. If a vector $\vec{p}$ is perpendicular to both $\vec{a}$ and $\vec{b}$, $\vec{p}\cdot\vec{c}=20$, $\vec{p}\cdot\left(\hat{i}-\hat{j}-\hat{k}\right)=12$, then '$t$' is equal to _____.

Question Number : 30 Question Id : 6760337761 Question Type : SA Correct Marks : 4 Wrong Marks : 0

Let S = $\{a \in \mathbb{N} \mid$ there exists $\lambda, \mu \in \mathbb{Z}$ such that $\lambda a^2+\mu a+6\lambda=1\}$. If p is the probability that a randomly selected 2-digit number is an element of S, then $48p$ is equal to _____.

Aptitude Test

Section Number : 3
Number of Questions : 50
Number of Questions to be attempted : 50
Section Marks : 200

Question Number : 31 Question Id : 6760337762 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Which temple complex is famous for its musical pillars ?

Options :

1. Meenakshi Temple
2. Brihadeshwara Temple
3. Hampi
4. Rameshwaram

Question Number : 32 Question Id : 6760337763 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Which of the following material is most suitable for parking areas ?

Options :

1. Concrete
2. Wood
3. Marble
4. Kota stone

Question Number : 33 Question Id : 6760337764 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Who is known as 'Queen of Curves' in Architecture ?

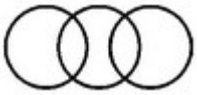
Options :

1. Jeanne Garg
2. Jane Drew
3. Jullia Morgan
4. Zaha Hadid

Question Number : 34 Question Id : 6760337765 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

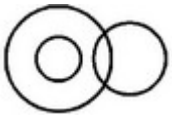
Which of the following Venn diagram correctly illustrates the relationship among the class : Cement, Structure, Concrete ?

Options :

1. 

2. 

3. 

4. 

Question Number : 35 Question Id : 6760337766 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Rings in a tree trunk represents -

Options :

1. Defects

2. Age

3. Strength

4. Weakness

Question Number : 36 Question Id : 6760337767 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Saint Gobin in Indian Market is known for which of the following product ?

Options :

1. Wooden doors

2. Glass

3. Modular kitchens

4. Wire cut bricks

Question Number : 37 Question Id : 6760337768 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Indian parliament building was designed by which Architect ?

Options :

1. Herbert Baker

2. B. V. Doshi

3. Raj Rewal

4. Sanjay Puri

Question Number : 38 Question Id : 6760337769 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Which of the following material cannot be recycled ?

Options :

1. Glass

2. Terracota

3. Steel

4. Paper

Question Number : 39 Question Id : 6760337770 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

What is the size of conventional brick ?

Options :

1. 230 mm × 115 mm × 70 mm

2. 230 mm × 110 mm × 75 mm

3. 230 mm × 115 mm × 75 mm

4. 230 mm × 110 mm × 65 mm

Question Number : 40 Question Id : 6760337771 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Which of the following site listed as the 1st UNESCO world heritage site in India ?

Options :

1. Bhimbetta Caves

2. Ajanta Caves

3. Jaipur City

4. Hampi

Question Number : 41 Question Id : 6760337772 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Which of the following scale represents the enlargement scale ?

Options :

1. 1 : 2

2. 1 : 20

3. 50 : 1

4. 1 : 1

Question Number : 42 Question Id : 6760337773 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

The Meerabai temple is located at which of the following fort ?

Options :

1. Jaigarh fort

2. Chittor fort

3. Nahargarh fort

4. Jhansi fort

Question Number : 43 Question Id : 6760337774 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

First Architecture college in Asia is located in which city ?

Options :

1. Tokyo

2. Mumbai

3. Lahore

4. Shanghai

Question Number : 44 Question Id : 6760337775 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

'Atal Tunnel' is located in which state of India ?

Options :

1. Uttarakhand

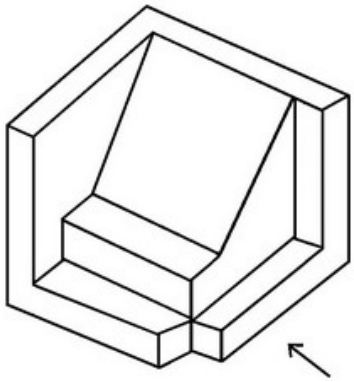
2. Jammu Kashmir

3. Punjab

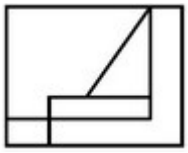
4. Himachal Pradesh

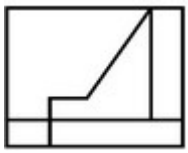
Question Number : 45 Question Id : 6760337776 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

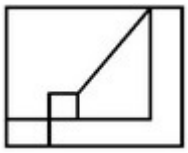
The 3D figure shows the view of an object. Identify the correct view looking in the direction of arrow from the answer figures.

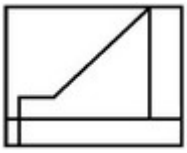


Options :

1. 

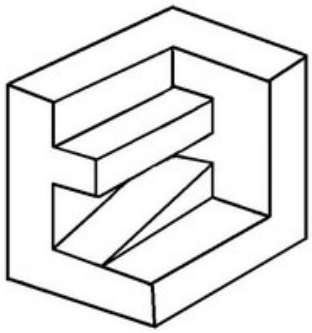
2. 

3. 

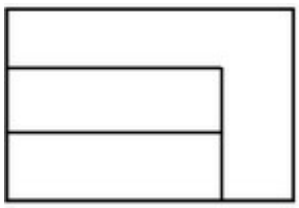
4. 

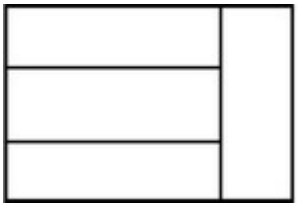
Question Number : 46 Question Id : 6760337777 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

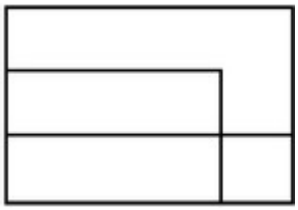
The 3D figure shows the view of an object. Identify the correct Top view from the answer figures.

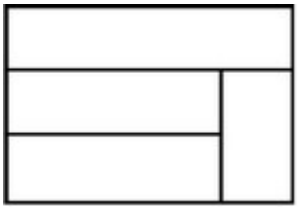


Options :

1. 

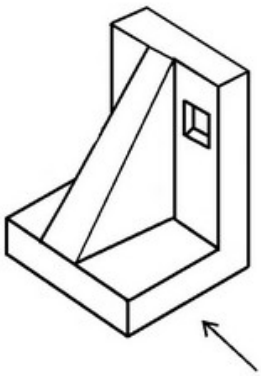
2. 

3. 

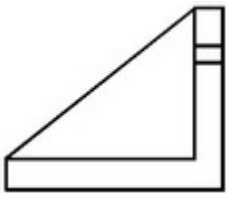
4. 

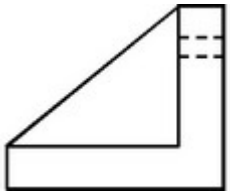
Question Number : 47 Question Id : 6760337778 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

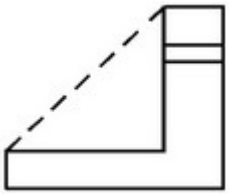
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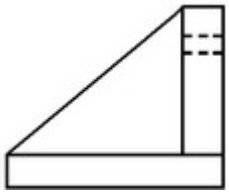


Options :

1. 

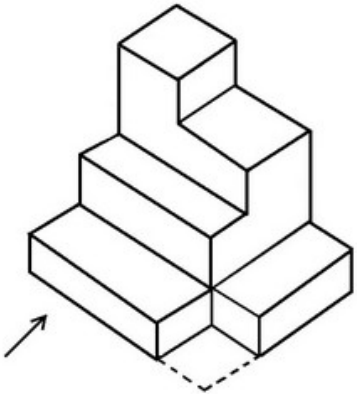
2. 

3. 

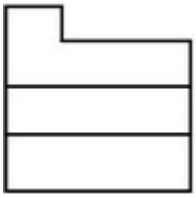
4. 

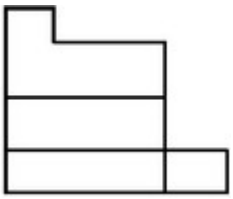
Question Number : 48 Question Id : 6760337779 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

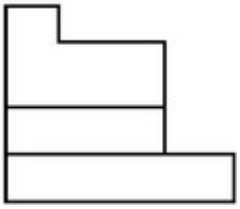
The 3D figure shows the view of an object. Identify the correct view looking in the direction of arrow from the answer figures.

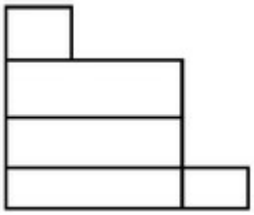


Options :

1. 

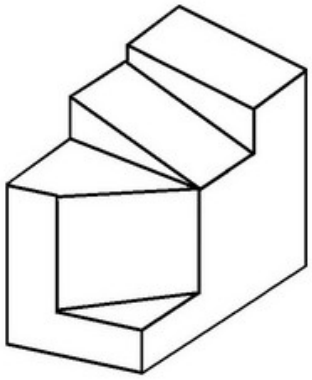
2. 

3. 

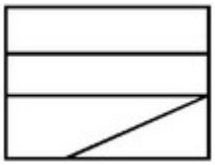
4. 

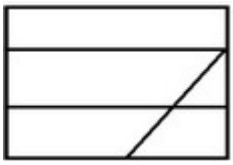
Question Number : 49 Question Id : 6760337780 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

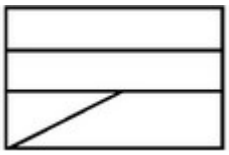
The 3D figure shows the view of an object. Identify the correct Top view from the answer figures.

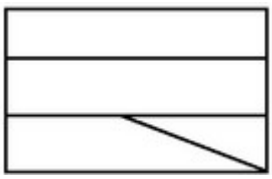


Options :

1. 

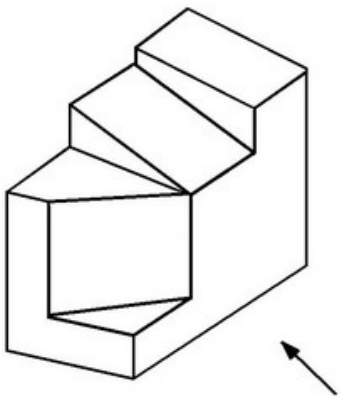
2. 

3. 

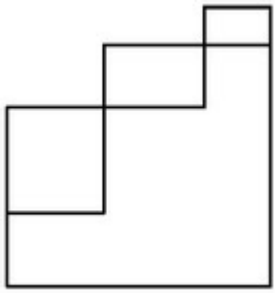
4. 

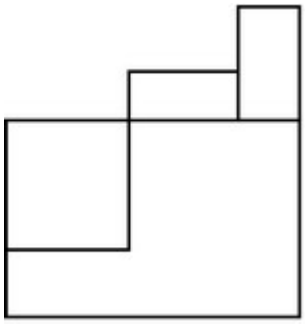
Question Number : 50 Question Id : 6760337781 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

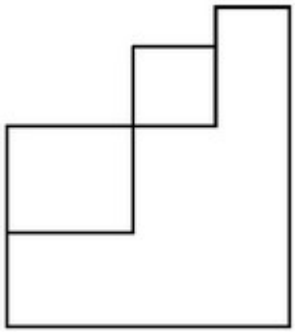
The 3D figure shows the view of an object. Identify the correct view looking in the direction of arrow from the answer figures.

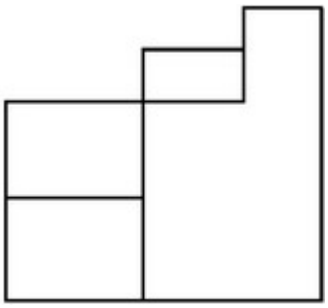


Options :

1. 

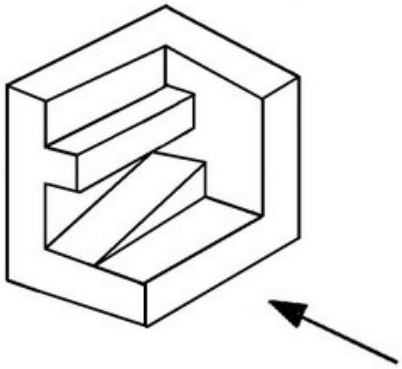
2. 

3. 

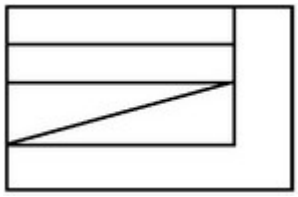
4. 

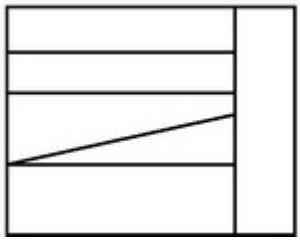
Question Number : 51 Question Id : 6760337782 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

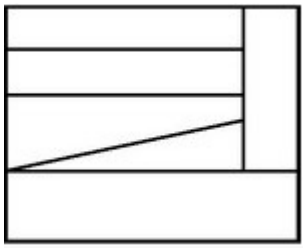
The 3D figure shows the view of an object. Identify the correct view looking in the direction of arrow from the answer figures.

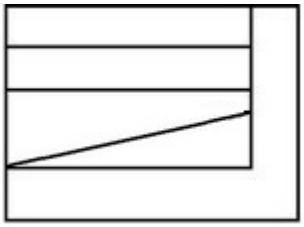


Options :

1. 

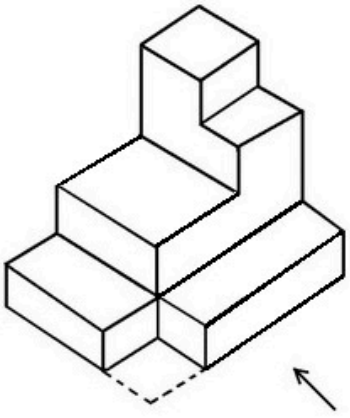
2. 

3. 

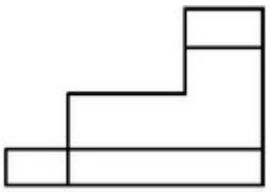
4. 

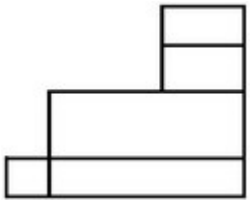
Question Number : 52 Question Id : 6760337783 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

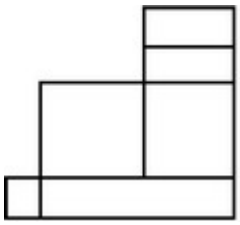
The 3D figure shows the view of an object. Identify the correct view looking in the direction of arrow from the answer figures.

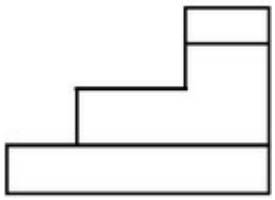


Options :

1. 

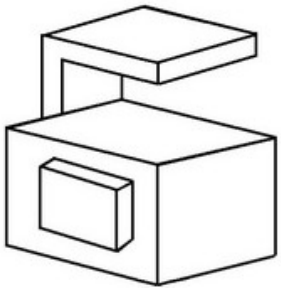
2. 

3. 

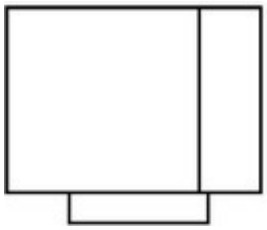
4. 

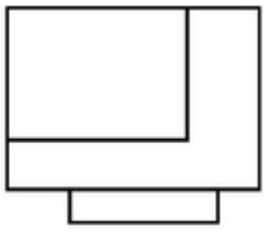
Question Number : 53 Question Id : 6760337784 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

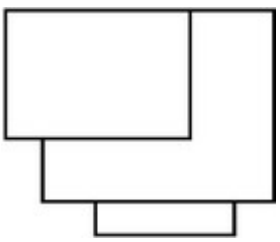
The 3D figure shows the view of an object. Identify the correct top view from the answer figures.

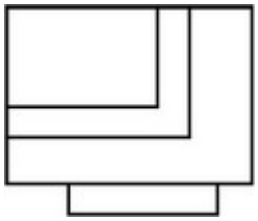


Options :

1. 

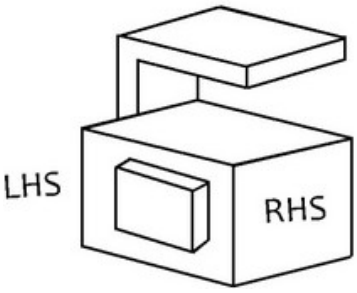
2. 

3. 

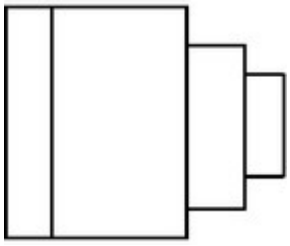
4. 

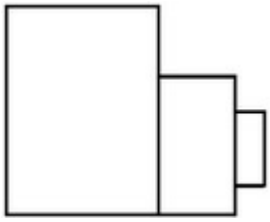
Question Number : 54 Question Id : 6760337785 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

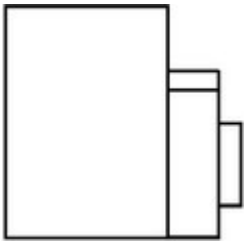
The 3D figure shows the view of an object. Identify the correct L.H.S. view, from the answer figures.

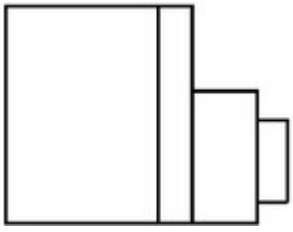


Options :

1. 

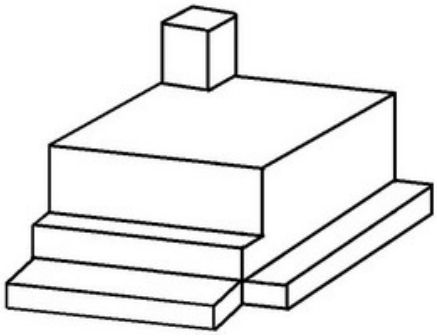
2. 

3. 

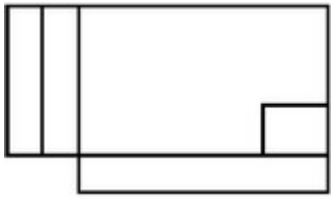
4. 

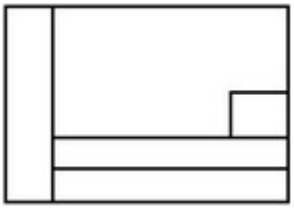
Question Number : 55 Question Id : 6760337786 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

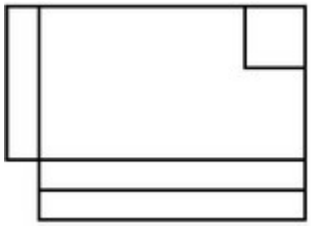
The 3D figure shows the view of an object. Identify the correct top view from the answer figures.

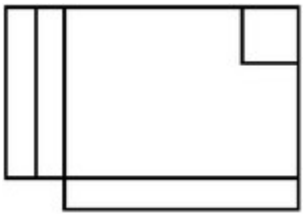


Options :

1. 

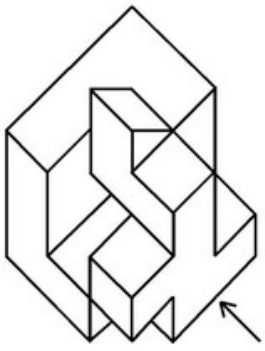
2. 

3. 

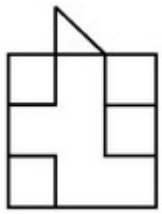
4. 

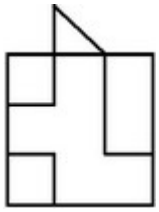
Question Number : 56 Question Id : 6760337787 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

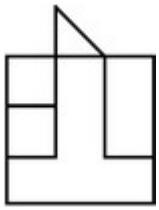
The 3D figure shows the view of an object. Identify the correct view looking in the direction of arrow from the answer figures.

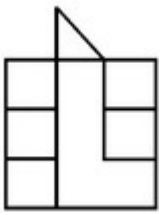


Options :

1. 

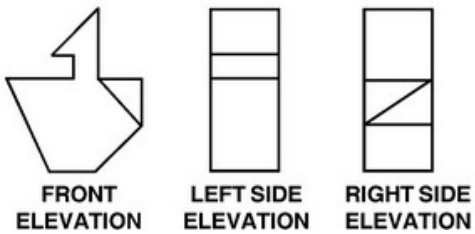
2. 

3. 

4. 

Question Number : 57 Question Id : 6760337788 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Three views (Front view, Left hand side view, Right hand side view) are given. Combine them and Identify the correct 3-Dimensional view from the answer figures.



Options :

1. 

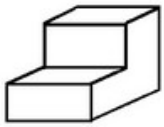
2. 

3. 

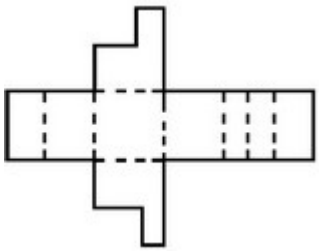
4. 

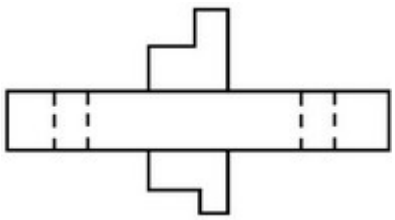
Question Number : 58 Question Id : 6760337789 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

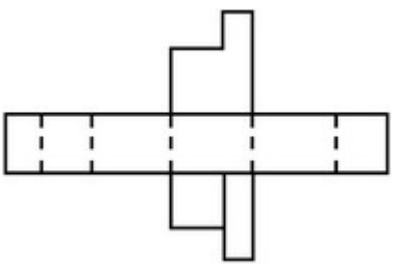
Which of the following answer figure shows the correct view of the 3-D image unfold ?

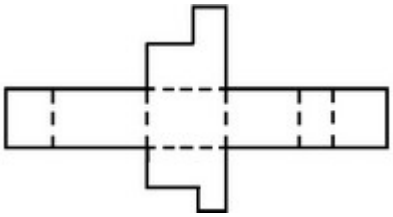


Options :

1. 

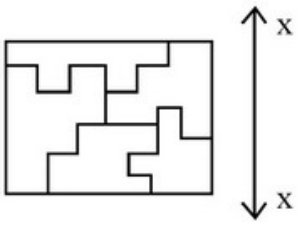
2. 

3. 

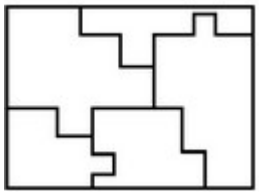
4. 

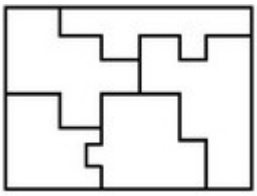
Question Number : 59 Question Id : 6760337790 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

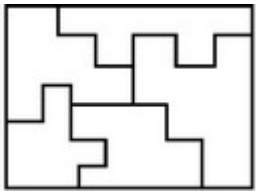
Which one of the answer figures is the correct mirror image of the problem figure with respect to x-x ?

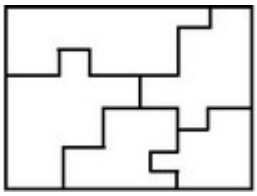


Options :

1. 

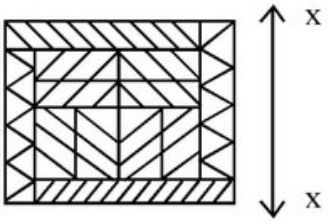
2. 

3. 

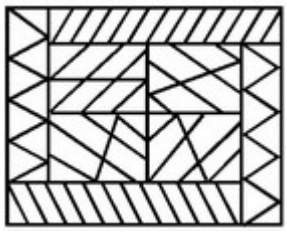
4. 

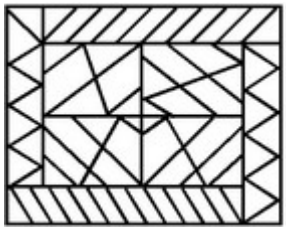
Question Number : 60 Question Id : 6760337791 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

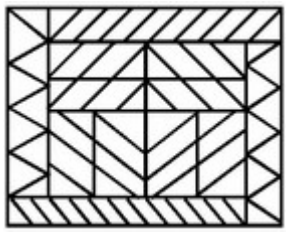
Which one of the answer figures is the correct Mirror image of the problem figure with respect to x-x ?

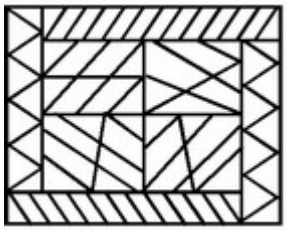


Options :

1. 

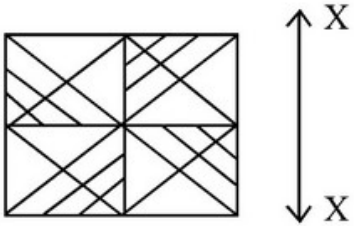
2. 

3. 

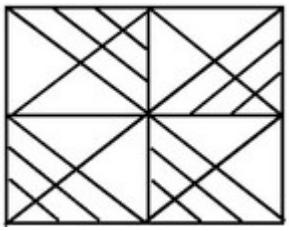
4. 

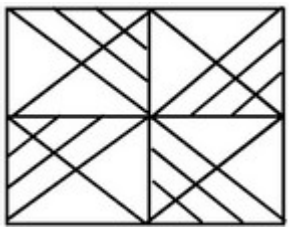
Question Number : 61 Question Id : 6760337792 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

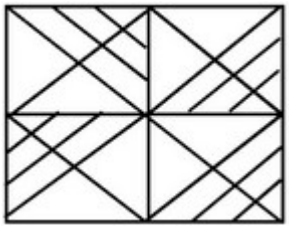
Which one of the answer figure is the correct Mirror image of the problem figure with respect to X-X ?

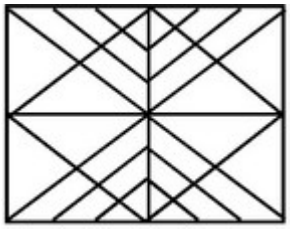


Options :

1. 

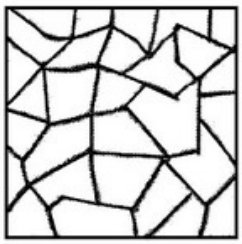
2. 

3. 

4. 

Question Number : 62 Question Id : 6760337793 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

One of the following answer figure is hidden in the problem figure in the same size and direction. Select the correct one.



Options :

1. 

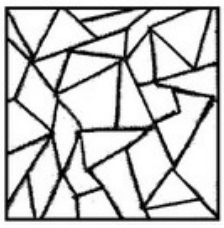
2. 

3. 

4. 

Question Number : 63 Question Id : 6760337794 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

One of the following answer figure is hidden in the problem figure in the same size and direction. Select the correct one.



Options :

1. 

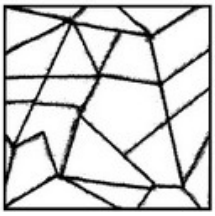
2. 

3. 

4. 

Question Number : 64 Question Id : 6760337795 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

One of the following answer figures is hidden in the problem figure in the same size and direction. Select the correct one.



Options :

1. 

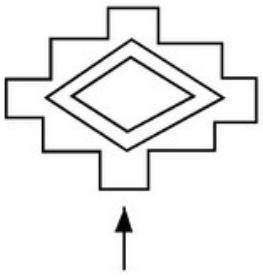
2. 

3. 

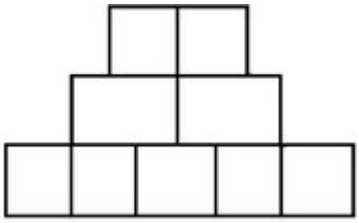
4. 

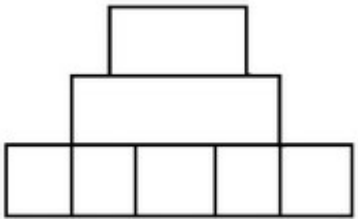
Question Number : 65 Question Id : 6760337796 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

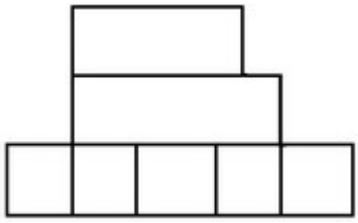
The problem figure shows the top view of an object. Identify the correct elevation from the figures looking in the direction of arrow.

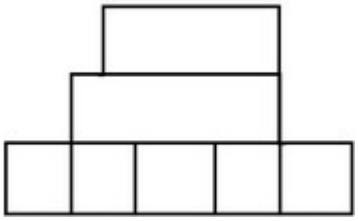


Options :

1. 

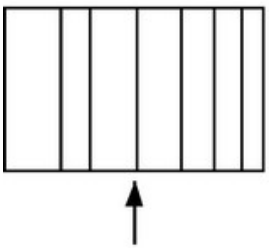
2. 

3. 

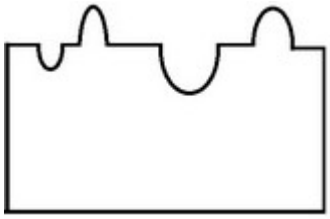
4. 

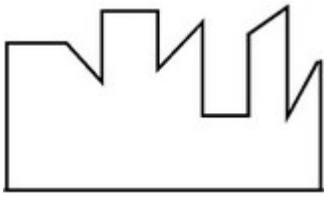
Question Number : 66 Question Id : 6760337797 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

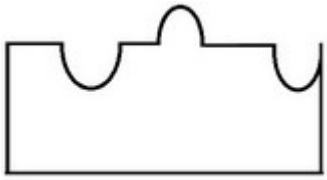
The problem figure shows the top view of an object. Identify the correct elevation from the answer figures looking in the direction of arrow.

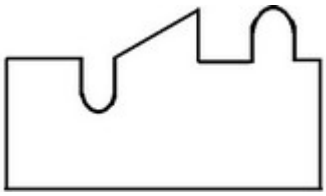


Options :

1. 

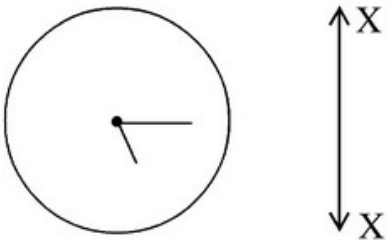
2. 

3. 

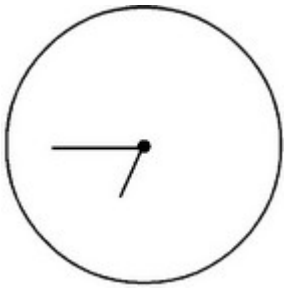
4. 

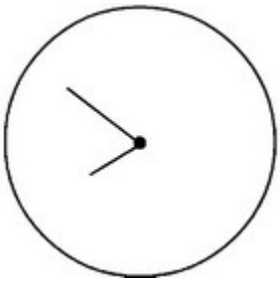
Question Number : 67 Question Id : 6760337798 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

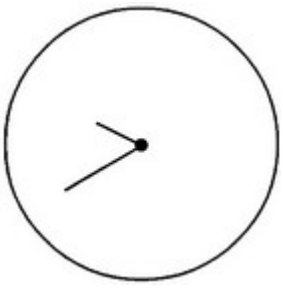
Which one of the answer figure is the correct Mirror image of the problem figure with respect to X-X ?



Options :

1. 

2. 

3. 

4. 

Question Number : 68 Question Id : 6760337799 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

'Shikara' is a type of boat found mainly in lakes of city of the following states.

Options :

1. Udaipur

2. Jammu-Kashmir

3. Kerala

4. Manipur

Question Number : 69 Question Id : 6760337800 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Who amongst the following designed the 'Ram Mandir' at Ayodhya ?

Options :

1. Chandrakant Sompura

2. Hafeez Contractor

3. Anant Raje

4. Raza Kabul

Question Number : 70 Question Id : 6760337801 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Which of the following group represent Primary colours ?

Options :

1. White, Black, Grey

2. Violet, Green, Orange

3. Red, Blue, Yellow

4. Red, Green, Black

Question Number : 71 Question Id : 6760337802 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

'Kedarnath' is located in which district of India ?

Options :

1. Uttarkashi

2. Uttarakhand

3. Chamoli

4. Rudraprayag

Question Number : 72 Question Id : 6760337803 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Who is the Architect of 'Virasat-e-Khalsa' ?

Options :

1. I. M. Pei

2. Moshie Safdie

3. Raj Rewal

4. Bimal Patel

Question Number : 73 Question Id : 6760337804 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Who was the Architect of famous 'Glass Pyramid at the Louvre Paris' ?

Options :

1. Walter Groupius

2. Charles Correa

3. I. M. Pei

4. F. L. Wright

Question Number : 74 Question Id : 6760337805 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Match the following List-I with List-II.

	List-I		List-II
A.	Madhubani painting	I.	Madhya Pradesh
B.	Shekhwati painting	II.	Orissa
C.	Pattuchitra painting	III.	Bihar
D.	Gond painting	IV.	Rajasthan

Options :

1. A-I, B-II, C-IV, D-III

2. A-III, B-IV, C-II, D-I

3. A-II, B-III, C-IV, D-I

4. A-IV, B-I, C-II, D-III

Question Number : 75 Question Id : 6760337806 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

What do you understand by 'Complementary colours' ? Choose correct answer amongst the following

Options :

1. Mixing the primary colours.

2. Colours next to each other on colour wheel.

3. Colours opposite to each other on colour wheel.

4. Mixing of secondary colours.

Question Number : 76 Question Id : 6760337807 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Who worked with 'Le-corbusier' on Chandigarh planning among following architects.

Options :

1. C. P. Kukreja

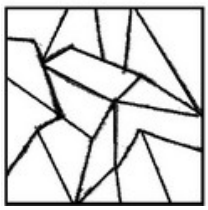
2. F. L. Wright

3. Stein Joseph

4. Raj Rewal

Question Number : 77 Question Id : 6760337808 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

One of the following answer figure is hidden in the problem figure in same size and direction. Select the correct one.



Options :

1. 

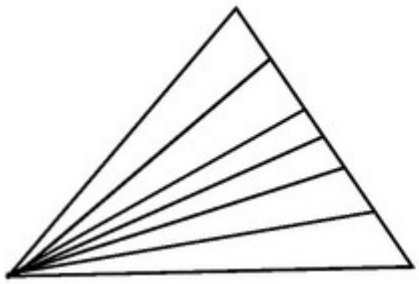
2. 

3. 

4. 

Question Number : 78 Question Id : 6760337809 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

In the following question number of triangles are ?



Options :

1. 15

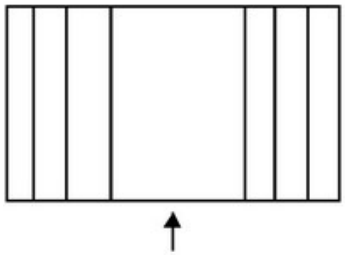
2. 19

3. 20

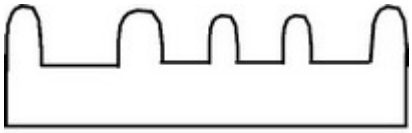
4. 21

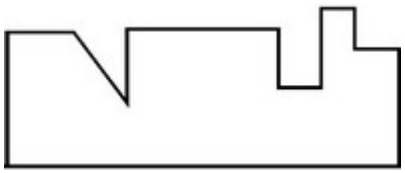
Question Number : 79 Question Id : 6760337810 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

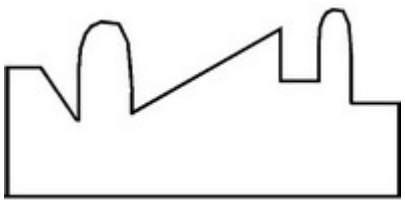
The problem figure shows the top view of an object. Identify the correct elevation from the answer figures looking in the direction of arrow.



Options :

1. 

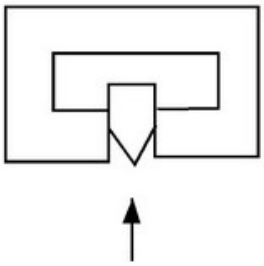
2. 

3. 

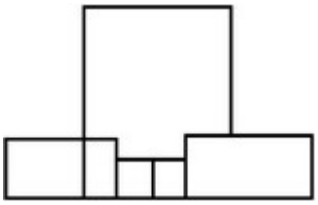
4. 

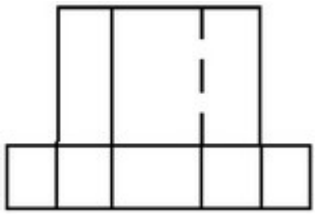
Question Number : 80 Question Id : 6760337811 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

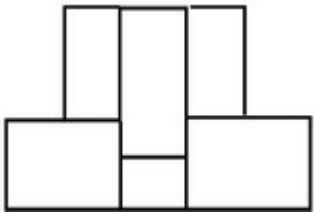
The problem figure shows the top view of an object. Identify the correct elevation from the answer figure. Looking in the direction of arrow.

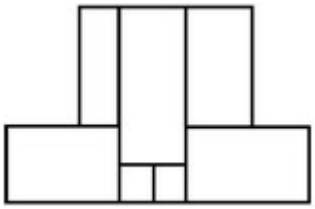


Options :

1. 

2. 

3. 

4. 

Planning

Section Number :	4
Number of Questions :	25
Number of Questions to be attempted :	25
Section Marks :	100

Question Number : 81 Question Id : 6760337812 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Which country has the highest life expectancy in the world in 2020 ?

Options :

1. Honk Kong

2. Switzerland

3. India

4. Australia

Question Number : 82 Question Id : 6760337813 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

(a) Metropolis (b) Neighbourhood

(c) Polis (d) Anthropos

Which of the following is the **correct** option based on the descending population size ?

Options :

1. (D) → (A) → (C) → (B)

2. (A) → (C) → (B) → (D)

3. (A) → (D) → (B) → (C)

4. (C) → (A) → (B) → (D)

Question Number : 83 Question Id : 6760337814 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

In which year the Indian Forest Act was passed ?

Options :

1. 1921

2. 1927

3. 1930

4. 1951

Question Number : 84 Question Id : 6760337815 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Which one of the following is NOT a dominant characteristics of Islamic cities during medieval period ?

Options :

1. Gardens

2. Candles

3. Mosque

4. Cathedral

Question Number : 85 Question Id : 6760337816 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Which of these is a capital city ?

Options :

1. Frankfurt

2. Sydney

3. New York

4. Stockholm

Question Number : 86 Question Id : 6760337817 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

The headquarters of World Health Organisation is located in :

Options :

1. Washington D.C.

2. Paris

3. Stockholm

4. Geneva

Question Number : 87 Question Id : 6760337818 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Match **List - I** with **List - II** :

	List - I		**List - II**
A	Auroville	I	Dilwara Temples
B	New Delhi	II	Dakshineshwar Temple
C	Mount Abu	III	Bahai Temple
D	Kolkata	IV	Matrimandir

Choose the **correct** answer from the options given below :

Options :

1. A-II, B-III, C-IV, D-I

2. A-III, B-II, C-IV, D-I

3. A-IV, B-II, C-I, D-III

4. A-IV, B-III, C-I, D-II

Question Number : 88 Question Id : 6760337819 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Which of the following was the main aim to promote 'World Trade Organisation' ?

Options :

1. To liberalise international trade.

2. To promote trade of rich countries.

3. To promote trade of poor countries.

4. To promote bilateral trade.

Question Number : 89 Question Id : 6760337820 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Gender division usually refers to :

Options :

1. Unequal child sex ratio.

2. Absence of voting rights for women.

3. Biological difference between men and women.

4. Unequal roles assigned by the society to men and women.

Question Number : 90 Question Id : 6760337821 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

The ways in which individuals may become cut-off from full involvement in the society is known as :

Options :

1. Social inclusion

2. Social inequality

3. Social stratification

4. Social exclusion

Question Number : 91 Question Id : 6760337822 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

The per capita income of a country is calculated by dividing :

Options :

1. The total income by total consumption.

2. The national income by its total population.

3. The total value of goods and services amongst its citizens.

4. The national income by total capital investments.

Question Number : 92 Question Id : 6760337823 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Which of the following problems is associated with burning of coal ?

Options :

1. generation of ash with toxic impurities.

2. spillage of coal-tar on land and land-degradation.

3. carbon dioxide emissions.

4. acid rain phenomenon.

Question Number : 93 Question Id : 6760337824 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

If the distance between points A and B on the map measures 2.5 cm and the scale given on the map is 1 : 500, what will be the distance between points A and B on actual ground ?

Options :

1. 12.5 cm

2. 20 cm

3. 12.5 m

4. 20 m

Question Number : 94 Question Id : 6760337825 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

The maximum potential of wind energy is available in which of the following states of India ?

Options :

1. Karnataka

2. Andhra Pradesh

3. Gujarat

4. Tamil Nadu

Question Number : 95 Question Id : 6760337826 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

What is the full form of GIS ? Choose the correct answer.

Options :

1. Geological Information System

2. Geographic Information System

3. Geo-scientific Intelligent System

4. Geo-photographic Intelligent Satellite

Question Number : 96 Question Id : 6760337827 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Match **List - I** with **List - II** :

	List - I		**List - II**
A	Satyagraha Movement	I	Alaknanda valley
B	Chipko Movement	II	Calcutta
C	Swadeshi Movement	III	Bambay
D	Quit India Movement	IV	Champaran

Choose the **correct** answer from the options given below :

Options :

1. A - I, B - IV, C - II, D - III

2. A - II, B - III, C - IV, D - I

3. A - III, B - IV, C - II, D - I

4. A - IV, B - I, C - II, D - III

Question Number : 97 Question Id : 6760337828 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

The concentration of NO_2 (in ppm) collected from 30 wards of a city is shown below :

Concentration of NO_2	Frequency
0.00 - 0.04	4
0.04 - 0.08	9
0.08 - 0.12	9
0.12 - 0.16	2
0.16 - 0.20	4
0.20 - 0.24	2

Find the mean concentration of NO_2 in the air. Choose the **correct** answer.

Options :

1. 0.99 ppm

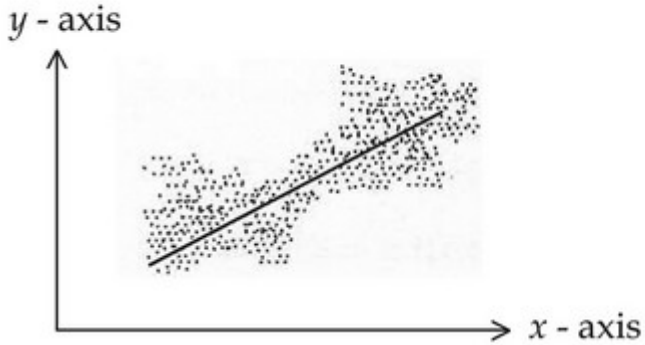
2. 0.009 ppm

3. 0.099 ppm

4. 9.0 ppm

Question Number : 98 Question Id : 6760337829 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Given scatter diagram can be interpreted as showing :



Options :

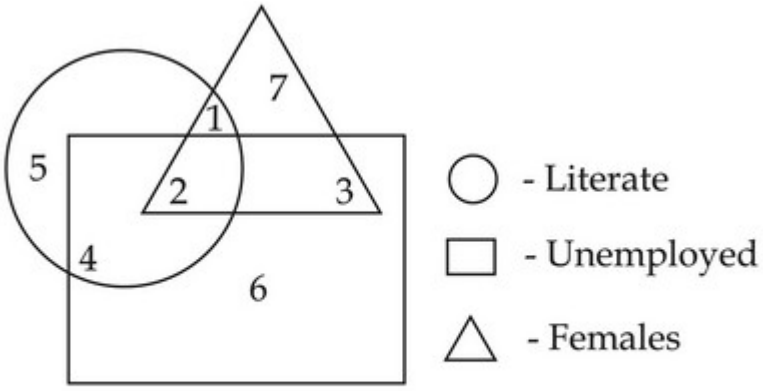
1. Low degree of positive correlation

2. High degree of positive correlation

3. Perfect positive correlation

4. No correlation

Question Number : 99 Question Id : 6760337830 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1



Which number represents unemployed and illiterate females ?

Options :

1. 2

2. 1

3. 4

4. 3

Question Number : 100 Question Id : 6760337831 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Given below are two statements : One is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.

Assertion (A) : Women home-based workers suffer from various ailments in a city.

Reason (R) : Metropolitan cities show a high growth of population from census 2001 to census 2011.

In the light of the above statements, choose the **correct** answer from the options given below :

Options :

1. Both **(A)** and **(R)** are true and **(R)** is the correct explanation of **(A)**.

2. Both **(A)** and **(R)** are true but **(R)** is **NOT** the correct explanation of **(A)**.

3. **(A)** is true but **(R)** is false.

4. **(A)** is false but **(R)** is true.

Question Number : 101 Question Id : 6760337832 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Given below are two statements : One is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.

Assertion (A) : Global temperature is expected to rise significantly.

Reason (R) : Increasing vehicular growth is causing increasing carbon dioxide emission in air.

In the light of the above statements, choose the *most appropriate* answer from the options given below :

Options :

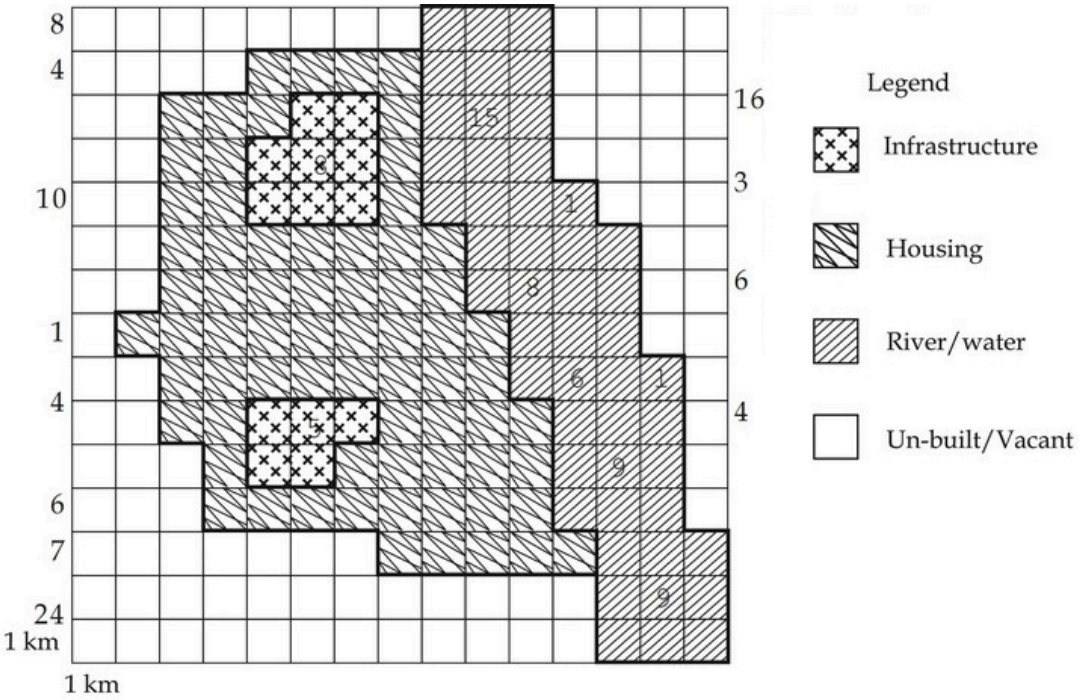
1. Both **(A)** and **(R)** are true and **(R)** is the correct explanation of **(A)**.

2. Both **(A)** and **(R)** are true but **(R)** is **NOT** the correct explanation of **(A)**.

3. **(A)** is true but **(R)** is false.

4. **(A)** is false but **(R)** is true.

Question Number : 102 Question Id : 6760337833 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1



The above layout shows built area as well as Un-built area. Housing area has four floors and infrastructure has seven floors. Find the ratio of land under built area to Non-built area. The correct answer is :

Options :

1. 142 : 92

2. 83 : 142

3. 83 : 92

4. 142 : 83

Question Number : 103 Question Id : 6760337834 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

The ratio of built housing area on all floors to built infrastructure area on all floors will be :

Options :

1. 280 : 91

2. 281 : 90

3. 90 : 281

4. 91 : 280

Question Number : 104 Question Id : 6760337835 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

In many Dutch and German cities, residential streets are now places where cars must give ways to pedestrians. In these traffic calmed areas, residents and visitors accept the view that the function of streets is not merely to provide mobility for cars. Streets may also be used for walking, cycling, playing and other social interactions. One of the most important aspects of these streets in the range of "traffic calming" initiatives, aimed at reducing the volume and speed of traffic. These initiatives lead to several positive effects on children's social interaction. Recent research has demonstrated that children in German cities have significantly higher level of freedom to travel to places unoccupied by adults in their own neighbourhood than children in other-cities of the world.

One of the main purposes of "traffic calming", as understood from the above passage is to :

Options :

1. calm the children playing on the street.

2. reduce the speeds of vehicles on the street.

3. reduce the noise created by traffic on the street.

4. calm the residents of the neighbourhoods to curb their aggressive nature.

Question Number : 105 Question Id : 6760337836 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

In many Dutch and German cities, residential streets are now places where cars must give ways to pedestrians. In these traffic calmed areas, residents and visitors accept the view that the function of streets is not merely to provide mobility for cars. Streets may also be used for walking, cycling, playing and other social interactions. One of the most important aspects of these streets in the range of "traffic calming" initiatives, aimed at reducing the volume and speed of traffic. These initiatives lead to several positive effects on children's social interaction. Recent research has demonstrated that children in German cities have significantly higher level of freedom to travel to places unoccupied by adults in their own neighbourhood than children in other-cities of the world.

As per the above passage, the "traffic calming" initiatives have impacted the children in these neighbourhoods in terms of :

Options :

1. enhancing their cognitive skills.

2. making them independent from parental control.

3. calming them.

4. increasing their mobility and social interactions.