1. Let $f : R \to R$ be a function defined by $f(x) = \max\{x, x^3\}$. The set of all points where $f(x)$ is NOT differentiable is

(A) $\{-1, 1\}$ (B) $(-1, 0)$
(C) $\{0, 1\}$ (D) $\{-1, 0, 1\}$

2. Let $f : (0, \infty) \to R$ and $F(x) = \int_0^x f(t)$. If $F(x)^2 = x^2(1+x)$, then $f(4)$ equals

(A) $\frac{5}{4}$ (B) 7
(C) 4 (D) 2

3. The left hand derivative of $f(x) = [x]\sin(\pi x)$ at $x = k$, k an integer is

(A) $(-1)^k(k-1)\pi$ (B) $(-1)^{k-1}(k-1)\pi$
(C) $(-1)^k k\pi$ (D) $(-1)^{k-1}k\pi$

4. If $f(x) = xe^{x(1-x)}$, then $f(x)$ is

(A) increasing on $\left[-\frac{1}{2}, 1\right]$
(B) decreasing on R
(C) increasing on R
(D) decreasing on $\left[-\frac{1}{2}, 1\right]$

5. $\lim_{x\to 0} \frac{\sin(\pi\cos^2 x)}{x^2}$ equals

(A) $-\pi$ (B) π
(C) $\pi/2$ (D) 1

6. The triangle formed by the tangent to the curve $f(x) = x^2 + bx - b$ at the point (1, 1) and the coordinate axes, lies in the first quadrant. If its area is 2, then the value of b is

(A) –1 (B) 3
(C) –3 (D) 1

7. Let $g(x) = 1 + x - [x]$ and $f(x) = \begin{cases} -1, & x < 0 \\ 0, & x = 0 \\ 1, & x > 0 \end{cases}$ Then for all x, $f(g(x))$ is equal to

(A) x (B) 1
(C) $f(x)$ (D) $g(x)$

8. If $f : [1, \infty) \to [2, \infty)$ is given by $f(x) = x + \frac{1}{x}$ then $f^{-1}(x)$ equals

(A) $\frac{x + \sqrt{x^2 - 4}}{2}$ (B) $\frac{x}{1+x^2}$
(C) $\frac{x - \sqrt{x^2 - 4}}{2}$ (D) $1 + \sqrt{x^2 - 4}$

9. The domain of definition of $f(x) = \frac{\log_2(x+3)}{x^2 + 3x + 2}$ is

(A) $R/\{-1, -2\}$ (B) $(-2, \infty)$
(C) $R\backslash\{-1, -2, -3\}$ (D) $(-3, \infty)\backslash\{-1, -2\}$

10. The equation of the common tangent touching the circle $(x - 3)^2 + y^2 = 9$ and the parabola $y^2 = 4x$ above the x-axis is

(A) $\sqrt{3}y = 3x + 1$ (B) $\sqrt{3}y = -(x + 3)$
(C) $\sqrt{3}y = x + 3$ (D) $\sqrt{3}y = -(3x + 1)$

11. The value of $\int_{-\pi}^{\pi} \frac{\cos^2 x}{1 + a^x} dx$, $a > 0$ is

(A) π (B) $a\pi$
(C) $\pi/2$ (D) 2π

12. Let AB be a chord of the circle $x^2 + y^2 = r^2$ subtending a right angle at the centre. Then the locus of the centroid of the triangle PAB as P moves on the circle is

(A) a parabola
(B) a circle
(C) an ellipse
(D) a pair of straight lines

13. The number of integer values of m, for which the x-coordinate of the point of intersection of the lines $3x + 4y = 9$ and $y = mx + 1$ is also an integer, is

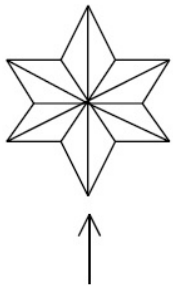
(A) 2 (B) 0
(C) 4 (D) 1

Q.1 One of the following answer figures is hidden in problem figure in the same size and direction.
Select correct one.

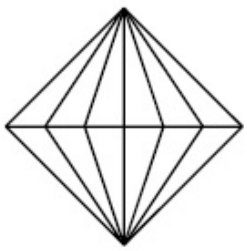
Options

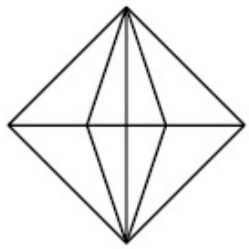
1. 
2. 
3. 
4. 

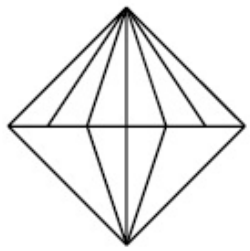
Q.2 The problem figure shows the top view of an object. Identify the correct elevation amongst the answer figures looking in the direction of arrow.

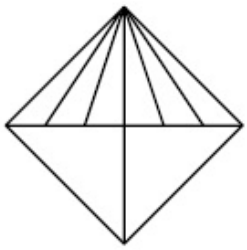


Options

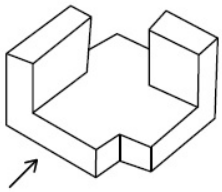
1. 

2. 

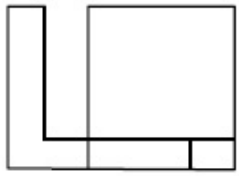
3. 

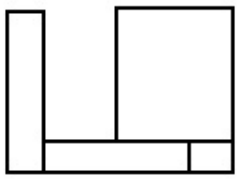
4. 

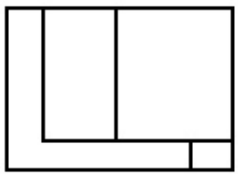
Q.3 The 3D figure shows the view of an object. Identify the correct view looking in the direction of arrow, amongst the answer figures.

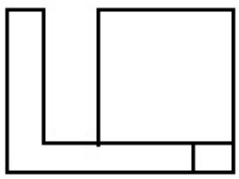


Options

1. 

2. 

3. 

4. 

Q.4 The first Indian Architect who has won Pritzker Prize in 2018 is :

Options
1. Laurie Baker
2. Raj Rewal
3. Achyut Kanvinde
4. B.V. Doshi

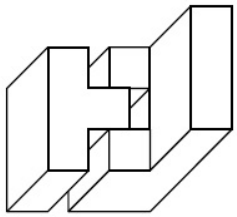
Q.5 Which among the following is the full form of the 'UNESCO' ?

Options
1. United Nations Educational, Scientific & Cultural Organization.
2. United Nations Educational Security Cultural Organization.
3. United Nations Educational, Sustainable & Cultural Organization.
4. United Nations Entrance Site Calling Organization.

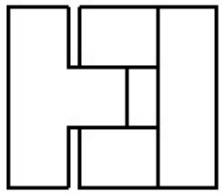
Q.6 'Volume Zero' Documentary is on which Architect ?

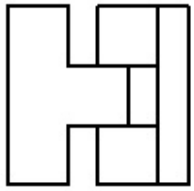
Options
1. Charles Correa
2. Ranjit Sabliki
3. Richard Mier
4. Jasbir Sachdev

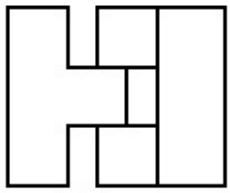
Q.7 The 3D figure shows the view of an object. Identify the correct top view, amongst the answer figures.

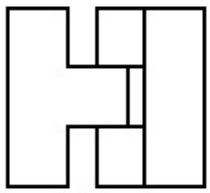


Options

1. 

2. 

3. 

4. 

Q.8 In the Southern Hemisphere shadowless light is from which direction ?

Options
1. East
2. North
3. West
4. South

Q.9 Match List - I with List - II.

List - I	List - II
(I) Agra fort	(a) 
(II) Atala Masjid	(b) 
(III) Nalanda University	(c) 
(IV) Jagannatha Temple	(d) 

Options

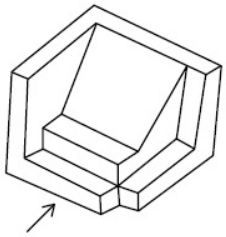
1. (I)-(b), (II)-(c), (III)-(a), (IV)-(d)
2. (I)-(a), (II)-(b), (III)-(c), (IV)-(d)
3. (I)-(b), (II)-(a), (III)-(c), (IV)-(d)
4. (I)-(c), (II)-(a), (III)-(d), (IV)-(b)

Q.10 Word "Bungalow" has originated from :

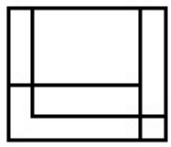
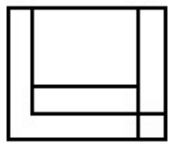
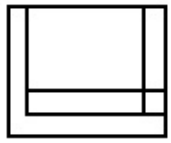
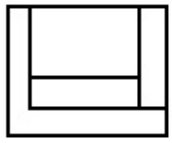
Options

1. Bengalurm
2. Banaras
3. Bari
4. Bengal

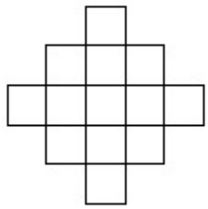
Q.11 The 3D figure shows the view of an object. Identify the correct view looking in the direction of arrow, amongst the answer figures.



Options

1. 
2. 
3. 
4. 

Q.12 In the given figure, how many squares are present ?



Options
1. 15
2. 14
3. 13
4. 18

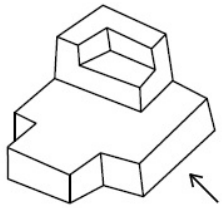
Q.13 Match List - I with List - II.

List - I		List - II
(I) Hall of Nation	(a)	
(II) Falling Water, Pennsylvania	(b)	
(III) Petronas Tower	(c)	
(IV) Secretariat	(d)	

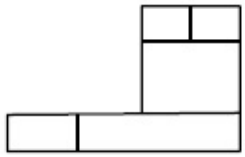
Options

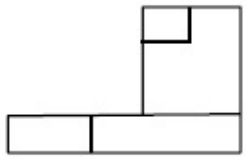
1. (I)-(b), (II)-(a), (III)-(c), (IV)-(d)
2. (I)-(b), (II)-(a), (III)-(d), (IV)-(c)
3. (I)-(c), (II)-(d), (III)-(a), (IV)-(b)
4. (I)-(a), (II)-(b), (III)-(c), (IV)-(d)

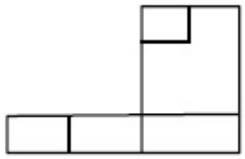
Q.14 The 3D figure shows the view of an object. Identify the correct view looking in the direction of arrow, amongst the answer figures.

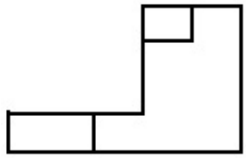


Options

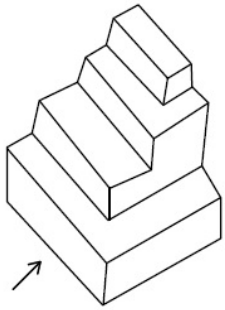
1. 

2. 

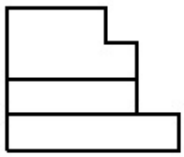
3. 

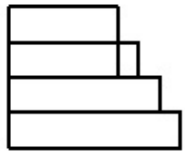
4. 

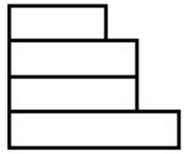
Q.15 The 3D figure shows the view of an object. Identify the correct view looking in the direction of arrow, amongst the answer figures.



Options

1. 

2. 

3. 

4. 

Q.16 The monsoon wind enters in Indian sub-continent from which direction ?

Options
1. South-West side
2. North side
3. South-East side
4. North-West side

Q.17 Victory Tower belongs to which of the following fort :

Options
1. Amer fort
2. Jaigarh fort
3. Bhangarh fort
4. Chittor fort

Drawing

1. Portrait of a Sardar standing at Golden Temple

Or

Make a view of a traditional market you have been to

2. Make a 2D composition using different sized hexagons, using warm colour scheme

Or

Corporation - Decode the Image and draw asthetic composition