

# JEE Main 2019

## Forenoon Session – Slot 1

### January 8 – Paper 2

Actual Question Paper with Answer Key



# JEE Main 2019 Paper 2 Question Paper (EH) & Answer Key: January 8, Slot 1

## Section : Mathematics

Let  $m$  and  $k$  be positive integers ( $m \neq k$ ).  
Then

Q.1  $\lim_{n \rightarrow \infty} n \left\{ \left(1 + \frac{1}{n}\right)^m + \left(1 + \frac{2}{n}\right)^m + \dots + \left(1 + \frac{k}{n}\right)^m - k \right\}$  is :

- Options 1. 0  
2.  $km$   
3.  $\frac{m(m+1)k}{2}$   
4.  $\frac{k(k+1)}{2}m$

The function  $f : \mathbb{R} \rightarrow \mathbb{R}$ , is given by

Q.2  $f(x) = \frac{x}{1 + |x|}$ , is :

- Options 1. onto but not one-one  
2. neither one-one nor onto  
3. one-one and onto  
4. one-one but not onto

$$\text{For } f(x) = \begin{cases} x \frac{e^{1/x} - e^{-1/x}}{e^{1/x} + e^{-1/x}}, & x \neq 0 \\ 0, & x = 0 \end{cases}$$

Q.3

Options 1.  $f$  is not differentiable at 0

2.  $f$  is not continuous at 0
3.  $f'(0) = 1$
4.  $f'(0) = 0$

Q.4 Two parallel chords are drawn on the same side of the centre of a circle of radius 20. It is found that they subtend  $60^\circ$  and  $120^\circ$  angles at the centre of the circle. Then the perpendicular distance between the chords is :

Options

1.  $5(\sqrt{3} + 1)$
2.  $10(\sqrt{2} - 1)$
3.  $5(\sqrt{3} - 1)$
4.  $10(\sqrt{3} - 1)$

Q.5 The compound statement

$$(\sim C \wedge A \wedge B) \vee (\sim C \wedge \sim A \wedge B) \vee (C \wedge B)$$

is equivalent to :

- Options
1. A
  2.  $\sim A$
  3. C
  4. B

Q.6

If for positive real numbers  $a$ ,  $b$  and  $c$ , the system of linear equations

$$x = a(y + z), y = b(z + x), z = c(x + y)$$

has non-trivial solutions, then

$$\frac{1}{1+a} + \frac{1}{1+b} + \frac{1}{1+c} \text{ is equal to :}$$

Options

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

Q.7 A real valued function

$f(x) = C \log_e |x| + Dx^3 + x$ ,  $x \neq 0$ , where  $C$  and  $D$  are constants, has critical points at  $x = -1$  and  $x = 2$ . Then the ordered pair  $(C, D)$  is :

Options

1.  $\left(\frac{2}{3}, -\frac{1}{9}\right)$
2.  $\left(\frac{1}{9}, -\frac{2}{3}\right)$
3.  $\left(-\frac{2}{3}, \frac{1}{9}\right)$
4.  $\left(-\frac{1}{9}, \frac{2}{3}\right)$

Q.8 Let  $P_1, P_2$  be any two points on a circle of radius  $r$  centred at the origin  $O$ , such that

$$\angle P_1OP_2 = \frac{\pi}{3}. \text{ If } P \text{ is the point of}$$

intersection of the tangents to the circle at  $P_1$  and  $P_2$ , then the locus of the point  $P$ , is :

Options 1.  $4(x^2 + y^2) = 3r^2$

2.  $x^2 + y^2 = 3r^2$

3.  $x^2 + y^2 = 4r^2$

4.  $3(x^2 + y^2) = 4r^2$

**Q.9** Let  $C$  be the circle whose diameter is the line segment formed by the line  $3x + 2y = 6$  intercepted by the coordinate axes. Then  $C$  also passes through the point :

**Options** 1.  $(2, 2)$

2.  $(1, 1)$

3.  $(2, 3)$

4.  $(3, 2)$

**Q.10** Let  $S_n$  be the sum of the first  $n$  - terms of the series

$$1^2 + 2 \cdot 5^2 + 3^2 + 2 \cdot 7^2 + 5^2 + 2 \cdot 9^2 + \dots$$

If  $S_{20} = 20A$ , then  $A$  is equal to :

**Options** 1. 2019

2. 1851

3. 1951

4. 2001

**Q.11** If  $\cos(\alpha + \beta) = \frac{4}{5}$  and  $\sin(\alpha - \beta) = \frac{5}{13}$ ,

where  $\alpha, \beta \in \left(0, \frac{\pi}{4}\right)$ , then the value of

$\tan 2\alpha$  is :

Options

1.  $\frac{56}{33}$

2.  $\frac{54}{33}$

3.  $\frac{58}{33}$

4.  $\frac{55}{33}$

Q.12 If  $z_1, z_2$  and  $z_3$  are any three distinct complex numbers such that  $|z_1|=1, |z_2|=2, |z_3|=4,$   
 $\arg z_2 = \arg z_1 - \pi$  and  $\arg z_3 = \arg z_1 + \frac{\pi}{2}$   
 then  $z_2 z_3$  is equal to :

Options

1.  $-8iz_1^2$

2.  $-\frac{8i}{z_1^2}$

3.  $\frac{8i}{z_1^2}$

4.  $8iz_1^2$

Q.13 If  $2\alpha$  is a root of  $ax^2 + bx + c = 0,$   $\beta$  is a root of  $ax^2 - 2bx - c = 0,$  and the real numbers  $a, b, c$  ( $a > 0$ ), are such that  $\beta < \alpha$ ; then a root  $\gamma$  of  $ax^2 + 4bx + 2c = 0$  always satisfies :

Options

1.  $\gamma < \beta < \alpha$

2.  $\beta < \alpha < \gamma$

3.  $\alpha < \gamma < 2\beta$

4.  $\beta < \gamma < \alpha$

Q.14 The value of  $\alpha$  for which the shortest distance between the lines represented by  $y + z = 0, z + x = 0$  and  $x + y = 0, x + y + z = \alpha$  is 1, is :

Options

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

2.  $\sqrt{\frac{3}{5}}$

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

4.  $\sqrt{\frac{5}{3}}$

Q.15 Let  $(1+x)^n = C_0 + C_1x + C_2x^2 + \dots + C_nx^n$  where  $C_r = {}^nC_r$  and  $(C_0 + C_1)(C_1 + C_2)\dots(C_{n-1} + C_n) = AC_1C_2\dots C_n$ . Then for  $n=5$ , A is equal to :

Options

1.  $3125/24$

2.  $625/24$

3.  $324/5$

4.  $128/3$

Q.16 A and B try to hit a target. The probability that A hits the target is  $\frac{7}{10}$  and the probability that B hits the target is  $\frac{4}{10}$ . If these two events are independent, the probability that B hits the target, given that the target is hit, is :

Options



1.  $\frac{17}{41}$

2.  $\frac{20}{41}$

3.  $\frac{19}{41}$

4.  $\frac{18}{41}$

Q.17

If  $f(x) = \int_e^{e^x} \log_e \left( \frac{x}{\log_e t} \right) dt$ , then the value

of  $\frac{3f'(3)}{e}$  is :

Options 1.  $-3 \log_e 3$ 

2.  $3 \log_e 3$

3.  $e^3 - e$

4.  $e^2 - 1$

Q.18

Let  $\vec{a} = 2\hat{i} + \hat{j} - 2\hat{k}$  and  $\vec{b} = \hat{i} + \hat{j}$ . If

$\vec{c}$  be a vector such that

$\vec{a} \cdot \vec{c} = |\vec{c}|$ ,  $|\vec{c} - \vec{a}| = 2\sqrt{2}$  and the angle

between  $\vec{a} \times \vec{b}$  and  $\vec{c}$  is  $30^\circ$ , then the

value of  $\left| \left( \vec{a} \times \vec{b} \right) \times \vec{c} \right|$  is :

Options

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

2. 3

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

4. 6

Q.19  
Options The distance of the point (1, 2, 3) from the plane  $x + y + z = 2$  measured parallel to the

line  $\frac{x+1}{-1} = \frac{y}{-2} = \frac{z-3}{1}$  is :

1.  $\sqrt{22}$
2.  $\sqrt{24}$
3.  $\sqrt{23}$
4.  $\sqrt{21}$

Q.20  
Options Let  $x_1, x_2, \dots, x_{20}$  be 20 observations and  $d_i = 2(x_i - 5)$ ,  $i = 1, 2, \dots, 20$ . If the mean and variance of  $d_1, d_2, \dots, d_{20}$  are 20 and 12 respectively, then the mean and variance of  $x_1, x_2, \dots, x_{20}$  are respectively,

1. 10 and 3
2. 15 and 4
3. 15 and 3
4. 10 and 4

For distinct positive numbers  $a$ ,  $b$  and  $c$ , if  $a^2, b^2, c^2$  are in A.P., then which one of the following triplets is also in A.P. ?

1.  $\frac{1}{b+c}, \frac{1}{c+a}, \frac{1}{a+b}$

Q.21

Options

$$2. \frac{1}{b-c}, \frac{1}{c-a}, \frac{1}{a-b}$$

$$3. \frac{1}{b-c}, \frac{1}{a-b}, \frac{1}{c-a}$$

$$4. \frac{1}{b+2c}, \frac{1}{c+2a}, \frac{1}{a+2b}$$

Q.22

Let  $F(x) = \int_0^x f(t) dt$ , where

$$f(x) = 2 + \sin x - \cos x. \text{ If}$$

$|F(x) - F(y)| \leq k|x - y|$  for all  $x$  and  $y$  in  $\mathbf{R}$ ,  
then a possible value of  $k$  is :

Options 1.  $2 + \sqrt{2}$

2.  $2 - \sqrt{2}$

3.  $\sqrt{2} - 1$

4.  $1 + \frac{1}{\sqrt{2}}$

Q.23

If  $B = \begin{bmatrix} -2 & -2 \\ -1 & 0 \end{bmatrix}$  and  $A$  is a matrix such

that  $A^{-1}B = B^{-1}$  and  $kA^{-1} = 2B^{-1} + I$ ,  
where  $k$  is some scalar and  $I$  is the  $2 \times 2$   
identity matrix, then the value of  $k$  is :

Options 1.  $-1$

2.  $-2$

3.  $1$

4.  $2$

Q.24

The value of the integral  $\int_{\pi/2}^{\pi} \frac{\sin(3x/2)}{\sin(x/2)} dx$  is :

- Options
1.  $\frac{\pi}{2} - 1$
  2.  $\frac{\pi}{2}$
  3.  $\frac{\pi}{2} - 2$
  4.  $\frac{\pi}{2} + 2$

Q.25 The solution of the differential equation

$$\frac{dy}{dx} + \frac{\sin 2y}{x} = x^3 \cos^2 y, \text{ is :}$$

(where C is a constant of integration)

- Options
1.  $x^2 \sin 2y = \frac{x^6}{6} + C$
  2.  $x^2 \tan y = \frac{x^6}{6} + C$
  3.  $x^2 \tan y = \frac{x^4}{4} + C$
  4.  $x^2 \cos 2y = \frac{x^6}{6} + C$

Q.26 If an ellipse has its foci at (2, 0) and (-2, 0) and its length of the latus rectum is 6, then the equation of the ellipse is :

- Options
1.  $\frac{x^2}{64} + \frac{y^2}{24} = 1$

$$2. \frac{x^2}{36} + \frac{y^2}{18} = 1$$

$$3. \frac{x^2}{16} + \frac{y^2}{12} = 1$$

$$4. \frac{x^2}{24} + \frac{y^2}{64} = 1$$

Q.27 The area (in sq. units) of the region bounded by the curve  $\sqrt{x} + \sqrt{y} = 1$ ,  $x, y \geq 0$ , and

the tangent to it at the point  $\left(\frac{1}{4}, \frac{1}{4}\right)$  is :

Options

1.  $\frac{1}{36}$

2.  $\frac{1}{8}$

3.  $\frac{1}{12}$

4.  $\frac{1}{24}$

Q.28 If  $m$  and  $n$  are the lengths of the perpendicular from the origin to the straight lines whose equations are  $x \cot \theta - y = 2 \cos \theta$  and

$$4x + 3y = -\sqrt{5} \cos 2\theta, \quad (\theta \in (0, \pi)),$$

respectively, then the value of  $m^2 + 5n^2$  is :

Options

1. 7

2. 1

3. 3

4. 5

**Q.29** For  $\beta \neq 0$ , if the coefficient of  $x^3$  in the binomial expansion of  $(1 + \beta x)^6$  and the coefficient of  $x^4$  in the binomial expansion of  $(1 - \beta x)^8$  are equal, then the value of  $\beta$  is :

- Options**
1.  $2/7$
  2.  $-2/7$
  3.  $-1/7$
  4.  $1/7$

**Q.30** If any tangent to the parabola  $x^2 = 4y$  intersects the hyperbola  $xy = 2$  at two points P and Q, then the mid-point of line segment PQ lies on a parabola with axis along :

- Options**
1.  $x$ -axis and focus on positive  $x$ -axis
  2.  $y$ -axis and focus on positive  $y$ -axis
  3.  $x$ -axis and focus on negative  $x$ -axis
  4.  $y$ -axis and focus on negative  $y$ -axis

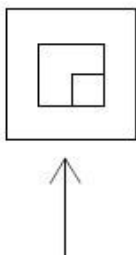
## Section : Aptitude

### Comprehension:

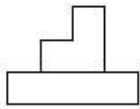
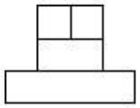
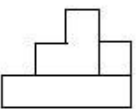
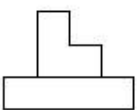
**Directions :** The problem figure shows the top view of an object. Identify the correct elevation from amongst the answer figures looking in the direction of the arrow.

**SubQuestion No : 1**

**Q.1**



Options

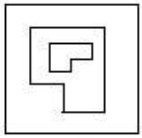
1. 
2. 
3. 
4. 

**Comprehension:**

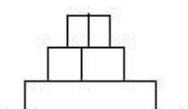
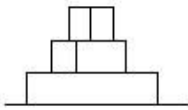
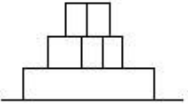
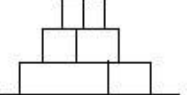
Directions : The problem figure shows the top view of an object. Identify the correct elevation from amongst the answer figures looking in the direction of the arrow.

**SubQuestion No : 2**

Q.2



Options

1. 
2. 
3. 
4. 

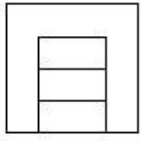


**Comprehension:**

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

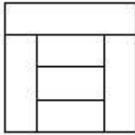
**SubQuestion No : 3**

Q.3

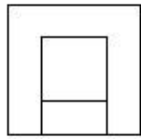


**Options**

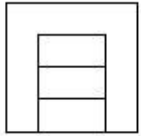
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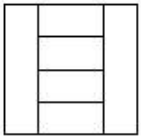
2.



3.



4.

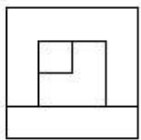


**Comprehension:**

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

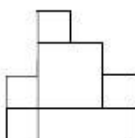
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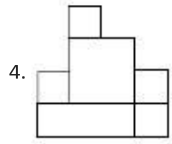
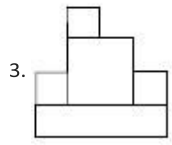
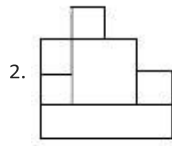
Q.4



**Options**

1.



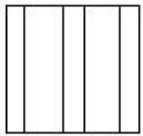


**Comprehension:**

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

**SubQuestion No : 5**

Q.5



**Options**

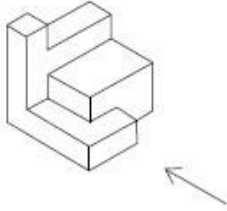


**Comprehension:**

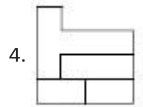
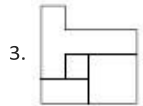
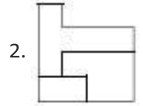
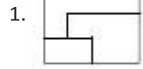
Directions : The 3 - D figure shows the view of an object. Identify the correct front view in the direction of the arrow, from amongst the answer figures.

SubQuestion No : 6

Q.6



Options

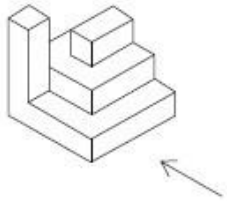


Comprehension:

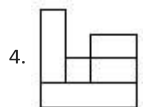
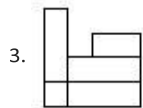
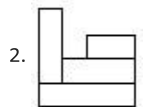
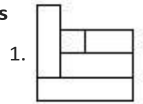
Directions : The 3 - D figure shows the view of an object. Identify the correct front view in the direction of the arrow, from amongst the answer figures.

SubQuestion No : 7

Q.7



Options

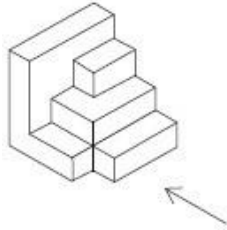


**Comprehension:**

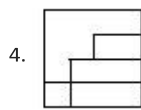
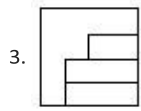
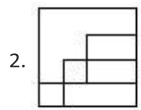
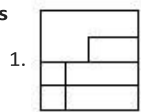
Directions : The 3 - D figure shows the view of an object. Identify the correct front view in the direction of the arrow, from amongst the answer figures.

**SubQuestion No : 8**

**Q.8**



**Options**

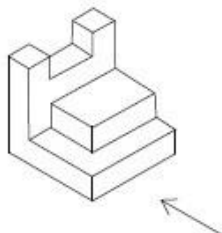


**Comprehension:**

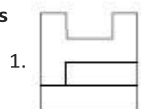
Directions : The 3 - D figure shows the view of an object. Identify the correct front view in the direction of the arrow, from amongst the answer figures.

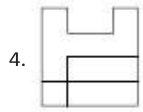
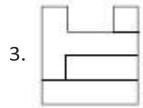
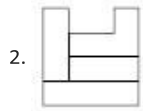
**SubQuestion No : 9**

**Q.9**



**Options**



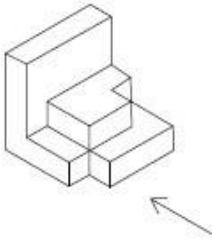


**Comprehension:**

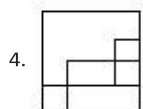
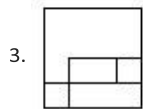
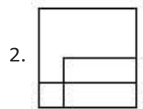
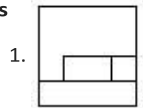
Directions : The 3 - D figure shows the view of an object. Identify the correct front view in the direction of the arrow, from amongst the answer figures.

**SubQuestion No : 10**

Q.10



**Options**

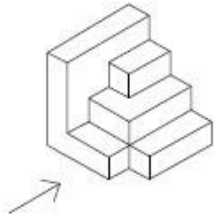


**Comprehension:**

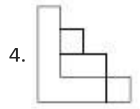
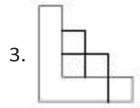
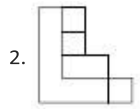
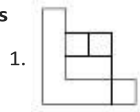
Directions : The 3 - D figure shows the view of an object. Identify the correct front view in the direction of the arrow, from amongst the answer figures.

**SubQuestion No : 11**

Q.11



Options

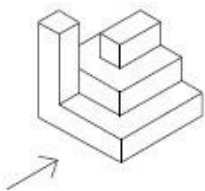


**Comprehension:**

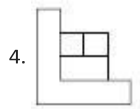
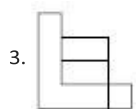
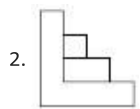
Directions : The 3 - D figure shows the view of an object. Identify the correct front view in the direction of the arrow, from amongst the answer figures.

SubQuestion No : 12

Q.12



Options

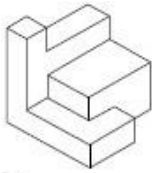


**Comprehension:**

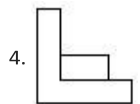
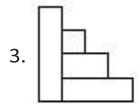
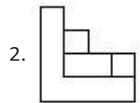
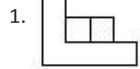
Directions : The 3 - D figure shows the view of an object. Identify the correct front view in the direction of the arrow, from amongst the answer figures.

**SubQuestion No : 13**

Q.13



**Options**

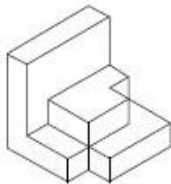


**Comprehension:**

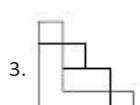
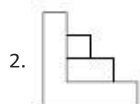
Directions : The 3 - D figure shows the view of an object. Identify the correct front view in the direction of the arrow, from amongst the answer figures.

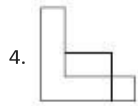
**SubQuestion No : 14**

Q.14



**Options**



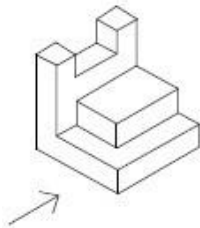


**Comprehension:**

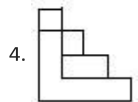
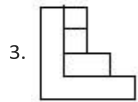
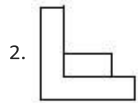
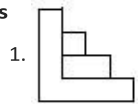
Directions : The 3 - D figure shows the view of an object. Identify the correct front view in the direction of the arrow, from amongst the answer figures.

**SubQuestion No : 15**

**Q.15**



**Options**

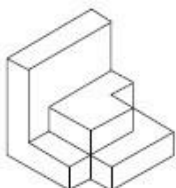


**Comprehension:**

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

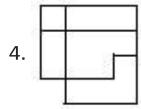
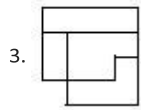
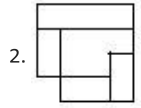
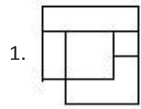
**SubQuestion No : 16**

**Q.16**



**Options**



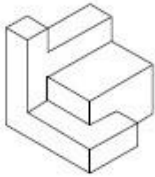


**Comprehension:**

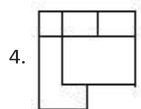
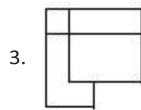
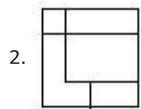
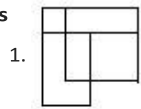
Directions : The 3 - D figure shows the view of an object. Identify the correct top view from amongst the answer figures.

**SubQuestion No : 17**

**Q.17**



**Options**

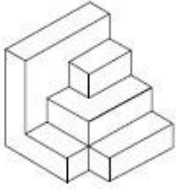


**Comprehension:**

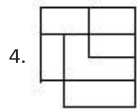
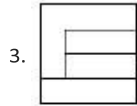
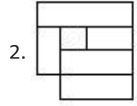
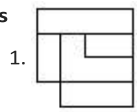
Directions : The 3 - D figure shows the view of an object. Identify the correct top view from amongst the answer figures.

SubQuestion No : 18

Q.18



Options

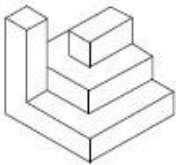


**Comprehension:**

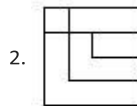
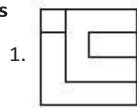
Directions : The 3 - D figure shows the view of an object. Identify the correct top view from amongst the answer figures.

SubQuestion No : 19

Q.19



Options

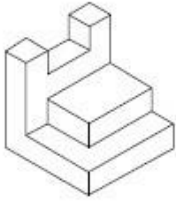


**Comprehension:**

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

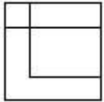
**SubQuestion No : 20**

**Q.20**

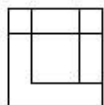


**Options**

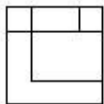
1.



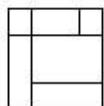
2.



3.



4.

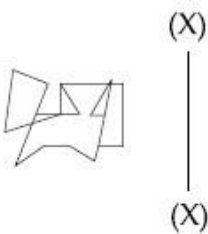


**Comprehension:**

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

**SubQuestion No : 21**

**Q.21**



**Options**

1.



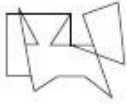
2.



3.



4.

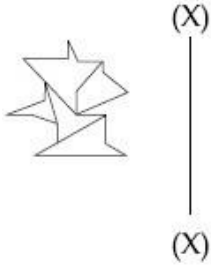


**Comprehension:**

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

**SubQuestion No : 22**

Q.22



**Options**

1.



2.



3.



4.

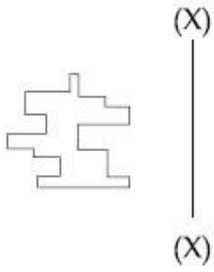


**Comprehension:**

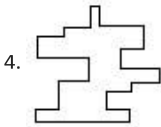
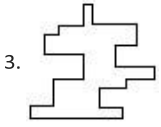
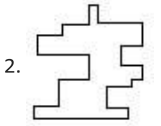
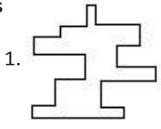
Directions : Which one of the answer figure is the correct mirror image of the problem figure with respect to X - X ?

**SubQuestion No : 23**

Q.23



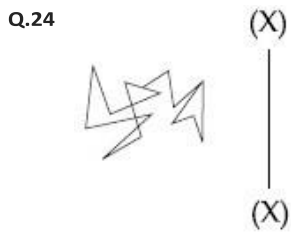
Options



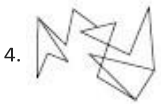
**Comprehension:**

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

SubQuestion No : 24



Options

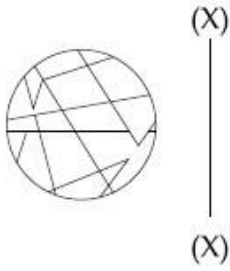


**Comprehension:**

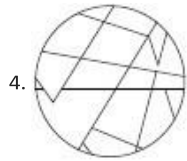
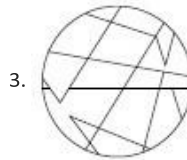
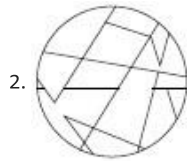
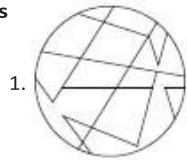
Directions : Which one of the answer figure is the correct mirror image of the problem figure with respect to X - X ?

**SubQuestion No : 25**

Q.25



**Options**



**Comprehension:**

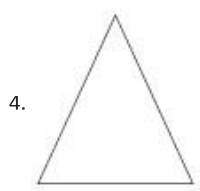
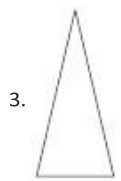
Directions : Find the odd figure out of the answer figures given below :

**SubQuestion No : 26**

Q.26 .

**Options**





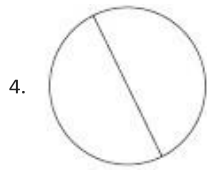
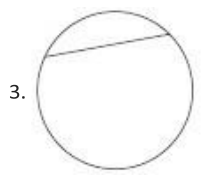
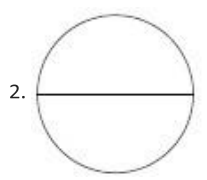
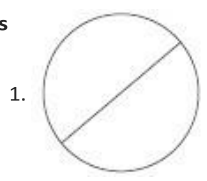
**Comprehension:**

Directions : Find the odd figure out of the answer figures given below :

SubQuestion No : 27

Q.27 .

Options



Comprehension:

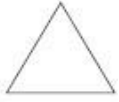
Directions : Find the odd figure out of the answer figures given below :

SubQuestion No : 28

Q.28 .

Options

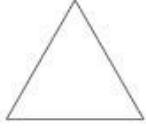
1.



2.



3.



4.



**Comprehension:**

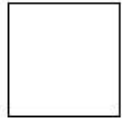
Directions : Find the odd figure out of the answer figures given below :

SubQuestion No : 29

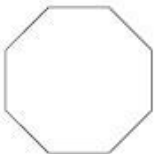
Q.29 .

Options

1.



2.



3.



4.



**Comprehension:**



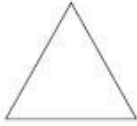
Directions : Find the odd figure out of the answer figures given below :

SubQuestion No : 30

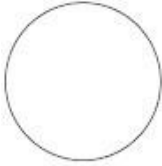
Q.30 .

Options

1.



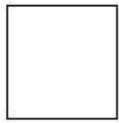
2.



3.



4.



**Comprehension:**

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

SubQuestion No : 31

Q.31



Options

1.



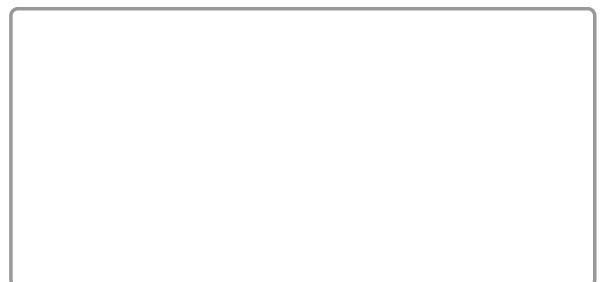
2.



3.



4.

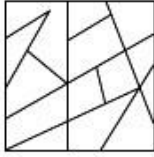


**Comprehension:**

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

**SubQuestion No : 32**

Q.32



Options

- 1.
- 2.
- 3.
- 4.

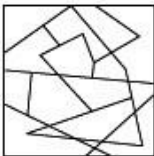


**Comprehension:**

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

**SubQuestion No : 33**

Q.33



Options

- 1.
- 2.
- 3.
- 4.

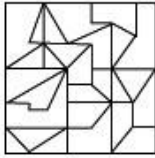


**Comprehension:**

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

**SubQuestion No : 34**

Q.34



Options

- 1.
- 2.
- 3.
- 4.

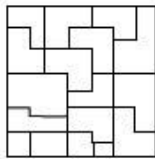


**Comprehension:**

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

SubQuestion No : 35

Q.35



Options

- 1.
- 2.
- 3.
- 4.



**Comprehension:**

SubQuestion No : 36

Q.36 In which of the following Indian city is the 'Bara Immambara' located ?

- Options
1. Lucknow
  2. Ahmedabad
  3. Hyderabad
  4. Delhi



Comprehension:

SubQuestion No : 37

Q.37 Which Indian city is abutting the Arabian Sea ?

- Options
1. Mumbai
  2. Surat
  3. Kolkata
  4. Chennai

Comprehension:

SubQuestion No : 38

Q.38 Which one of the following is a primary color ?

- Options
1. Orange
  2. Purple
  3. Green
  4. Red

Comprehension:

SubQuestion No : 39

Q.39 Cavity walls are which one of the following ?

- Options
1. Walls with air gap
  2. Walls with doors
  3. Walls with holes

4. Walls with windows

Comprehension:

.

SubQuestion No : 40

Q.40 Which one of the following is not a planned city ?

- Options
1. Kanpur
  2. Chandigarh
  3. Gandhi nagar
  4. Bhubaneswar

Comprehension:

.

SubQuestion No : 41

Q.41 Frame structure in high rise building pertains to which one of the following ?

- Options
1. Columns and Beams structure
  2. Structure with squares on the facade
  3. Load bearing wall structure
  4. A square building

Comprehension:

.

SubQuestion No : 42

Q.42 In the Northern Hemisphere the winter sun rises from which direction amongst the following ?

Options

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

Comprehension:

.

SubQuestion No : 43

Q.43 What does the abbreviation NASA stand for amongst the following ?

- Options
1. National Archeology Studies Academy
  2. National Art and Science Association
  3. National Architecture and Science Association
  4. National Aeronautics and Space Administration

Comprehension:

.

SubQuestion No : 44

Q.44 Which color amongst the following represents danger ?

- Options
1. White
  2. Red
  3. Green
  4. Black

Comprehension:

SubQuestion No : 45

Q.45 What does the abbreviation ISRO stand for amongst the following ?

- Options
1. International Settlements and Relief Organization
  2. International Sea and Rain Office
  3. Indian Studies and Result Office
  4. Indian Space Research Organization

Comprehension:

SubQuestion No : 46

Q.46 Green buildings are associated with which of the following :

- Options
1. Location
  2. Beauty
  3. Landscape
  4. Environmental suitability

Comprehension:

SubQuestion No : 47

Q.47 Chajjas above windows are meant to protect the building from which of the following ?

- Options
1. Birds
  2. Sun
  3. Typhoon
  4. Wind

Comprehension:

.

SubQuestion No : 48

Q.48 Which one of the following is a horizontal element that supports the loads above openings in walls in a building ?

- Options
1. Foundation
  2. Lintel
  3. Pillar
  4. Column

Comprehension:

.

SubQuestion No : 49

Q.49 A byte is which one of the following ?

- Options
1. A group of stars
  2. An act of an acrobat
  3. A unit of digital memory
  4. A unit of sound

Comprehension:

.

SubQuestion No : 50

Q.50 In which of the following Indian city are the 'Shaking Minarets' located ?

- Options
1. Ahmedabad
  2. Delhi
  3. Lucknow
  4. Hyderabad

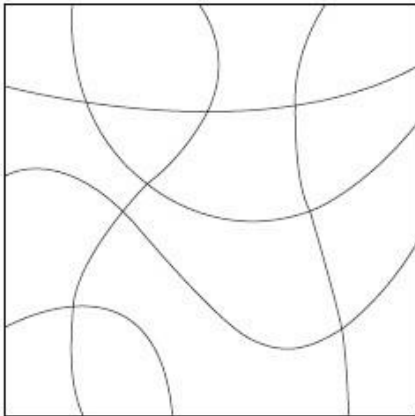


## Section: Drawing

- Q.  
1 (a) In the space provided in the answer sheet for this question, draw margin lines to form a frame. In this frame create an aesthetic composition using only curved lines. The shapes created by these curved lines can be of any size, and may be placed separate, overlapping or within each other. The idea is to produce an aesthetic and visually exciting composition of these shapes in the frame without making it represent any realistic form like house face etc. The composition should be filled with some colors of your choice so that the visual quality of the composition is enhanced.

20 Marks

- Q.  
2 (b) Draw the graphic image shown below to double its size in the space provided for the answer of this question. Each component line should be drawn double its length and correctly positioned direction wise as shown in the question figure.



20 Marks

Q.  
3

- (c) Design an appropriate pattern for a curtain for a small girl's room. Draw and color it. **30 Marks**

**OR**

Draw a picture of your favorite film star's face as realistic as possible.

**OR**

Draw from imagination a picture of some people sitting around a bonfire.