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JEE MAIN SAMPLE PAPER

Paper 2 for B.Arch

SET B

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Maths

Q1. Let S be the set of all real values of 'a' for which the following system of linear equations
ax+2y+5z=1
2x+y+3z=1
3y+7z=1
is consistent. Then the set S is :
1. equal to R
2. equal to R−{1}
3. equal to {1}
4. an empty set

Correct. 1

Q2. An urn contains 5 red, 4 black and 3 white marbles. Then the number of ways in which 4 marbles can be drawn from it so that at most 3 of them are red, is :
1. 455
2. 460
3. 490
4. 495

Correct. 3

Q3. The perpendicular distance from the point (3, 1, 1) on the plane passing through the point (1, 2, 3) and containing the line, $\overrightarrow{\mathrm{r}} = \hat{i} + \hat{j} + \lambda(2\hat{i} + \hat{j} + 4\hat{k})$ is :
1. $\frac{1}{\sqrt{11}}$
2. $\frac{4}{\sqrt{41}}$
3. 0
4. $\frac{3}{\sqrt{11}}$

Correct. 3

Q4. The value of $\frac{1}{\cos 285^\circ} + \frac{1}{\sqrt{3}\sin 255^\circ}$ is:
1. $2\sqrt{2}$
2. $\frac{4\sqrt{2}}{\sqrt{3}}$

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

Correct. 2

Q5. An observer standing at a point P on the top of a hill near the sea-shore notices that the angle of depression of a ship moving towards the hill in a straight line at a constant speed is 30°. After 45° minutes, this angle becomes 45°. If T (in minutes) is the total time taken by the ship to move to a point in the sea where the angle of depression from P of the ship is 60°, then T is equal to :
1. $45(1+\sqrt{3})$
2. $45\left(1+\frac{2}{\sqrt{3}}\right)$
3. $45\left(2+\frac{1}{\sqrt{3}}\right)$
4. $45\left(1+\frac{1}{\sqrt{3}}\right)$

Correct. 4

Q6. A and B try to hit a target. The probability that A hits the target is 7/10 and the probability that B hits the target is 4/10. If these two events are independent, the probability that B hits the target, given that the target is hit, is:
1. 17/41
2. 18/41
3. 20/41
4. 19/41

Correct. 3

Q7. The compound statement (~C∧A∧B) v (~C∧~A∧B) v (C∧B)
is equivalent to:
1. B
2. A
3. ~A
4. C

Correct. 1

Q8. 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. $\frac{1}{b+2c}, \frac{1}{c+2a}, \frac{1}{a+2b}$
2. $\frac{1}{b-c}, \frac{1}{a-b}, \frac{1}{c-a}$
3. $\frac{1}{b+c}, \frac{1}{c+a}, \frac{1}{a+b}$
4. $\frac{1}{b-c}, \frac{1}{c-a}, \frac{1}{a-b}$

Correct. 3

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Q9. 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. $\sqrt{23}$
2. $\sqrt{22}$
3. $\sqrt{24}$
4. $\sqrt{21}$

Correct. 3

Q10. 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:

1. $-3\log_e 3$
2. $3\log_e 3$
3. $e^2 - 1$
4. $e^3 - e$

Correct. 3

Q11. The value of α for which the shortest distance between the lines represented by y+z=0, z+x=0 and x+y=0, x+y+z=α is 1, is :

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

Correct. 4

Q12. 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 - π and arg z_3 = arg z_1 + π/2, then z_1z_3 is equal to :

1. $\frac{8i}{z_1^2}$
2. $-8iz_1^2$
3. $-\frac{8i}{z_1^2}$
4. $8iz_1^2$

Correct. 2

Q13. Let z(≠ -1) be any complex number such that |z|=1. Then the imaginary part of $\frac{\bar{z}(1-z)}{z(1+\bar{z})}$ is:

1. -tan(θ/2) Sinθ
2. tan(θ/2) Cosθ
3. -tan(θ/2) Cosθ
4. tan(θ/2) Sinθ

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Correct. 3

Q14. Let A be a 2x2 matrix such that $A^2+A+1=0$ where $I=I_2$. Then $|adj((I-A)^6)|$ is equal to:

1. 3^3
2. 3^4
3. 3^6
4. 3^9

Correct. 3

Q15. Let A be the set of all 3 digit natural numbers and B={xЄA: H.C.F. (x,15)=1}. Then the number of elements in B is:

1. 420
2. 360
3. 480
4. 240

Correct. 3

Q16. The sum of the infinite series $1+2+\frac{2}{3}+\frac{6}{3^2}+\frac{10}{3^3}+\frac{14}{3^4}+\ldots\ldots\ldots$ is : :

1. 4
2. 5
3. 6
4. 9/2

Correct. 2

Q17. $\lim_{x\to 3}\frac{\sqrt{x+6}-\sin(x-3)-3}{(x-3)\cos(x-3)}$ is equal to :

1. 5/6
2. 1/6
3. -2/3
4. -5/6

Correct. 4

Q18. Let P be a point on the parabola $y^2=3x$ such that OP makes an angle of π/6 with the x-axis, where O is the origin. A normal is drawn to the parabola at P intersecting the axis of the parabola at Q. If S is the focus Of the parabola, then SQ is equal to :

1. 39/2
2. 39/4
3. 9
4. 41/4

Correct. 2

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Q19. If the two lines $\frac{x-2m}{2m+5} = \frac{y}{8m} = \frac{z-4}{2}$ and $\frac{x-2}{m-2} = \frac{y}{-1} = \frac{z-2m}{1-3m}$ are parallel for some m ∈ R, then the distance between them is:
1. √10
2. 2√5
3. √29
4. √34

Correct. 4

Q20. If three vectors $\overrightarrow{v}_1 = \alpha\hat{i} + \hat{j} + \hat{k}$,
$\overrightarrow{V}_2 = \hat{i} + \beta\hat{j} - 2\hat{k}$, and
$\overrightarrow{V}_3 = \hat{i} + \hat{j}$ are coplanar,
$\overrightarrow{v}_1$ and
$\overrightarrow{v}_3$ are perpendicular, then the vector $\overrightarrow{V}_1$(\times \overrightarrow{\mathrm{V}_{2}}\) is:
1. $-\hat{i} + \hat{j} + 2\hat{k}$
2. $\hat{i} - \hat{j} + 2\hat{k}$
3. $\hat{i} + \hat{j}$
4. $2\hat{i} - 2\hat{j} + \hat{k}$

Correct. 2

Q21. Let Tn be the number of all possible triangles formed by joining vertices of an n-sided regular polygon. If Tn+1 – Tn = 10, then the value of n is _____?

Correct. 5

Q22. Let A and B be two sets containing 2 elements and 4 elements respectively. The number of subsets of A × B having 3 or more elements is ___?

Correct. 219

Q23. If the tangent at (1, 7) to the curve x^2=y–6 touches the circle x^2+y^2+16x+12y+c=0 then the value of c is _____?

Correct. 95

Q24. The sum of the following series
$1 + 6 + \frac{9\left(1^2+2^2+3^2\right)}{7} + \frac{12\left(1^2+2^2+3^2+4^2\right)}{9} + \frac{15\left(1^2+2^2+\ldots+5^2\right)}{11} + \cdots$ upto 15 terms is _____?

Correct. 7820

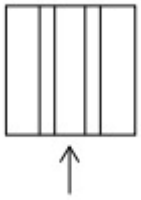
Q25. The coefficient of t^4 in the expansion of $\left(\frac{1-t^6}{1-t}\right)^3$ is _____?

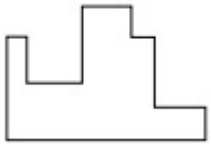
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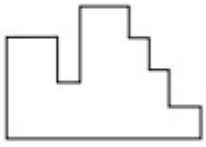
Correct. 15

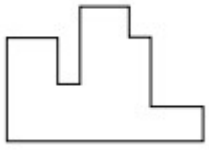
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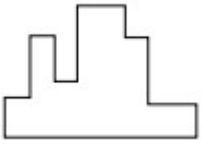
Q1. The problem figure shows the top view of an object. Identify the correct elevation from amongst the answer figures looking in the direction of the arrow.



1. 

2. 

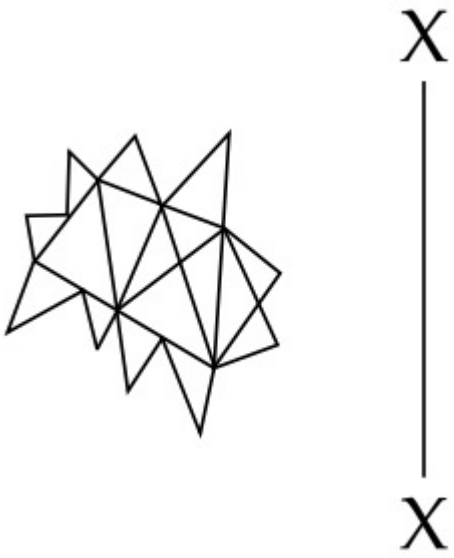
3. 

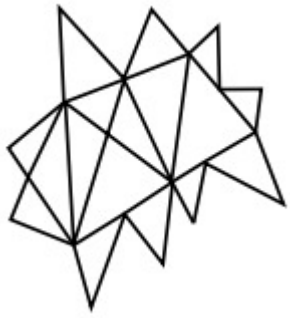
4. 

Correct. 3

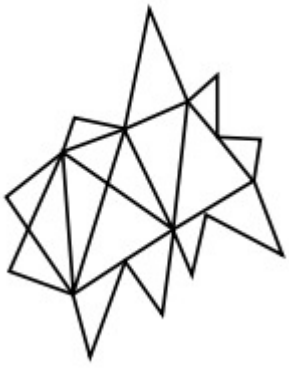
Q2. Which one of the answer figures is the correct mirror image of the problem figure with respect to X - X ?

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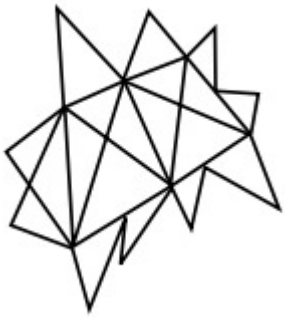


1. 

2. 

3. 

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4. 

Correct. 1

Q3. Problem Figures

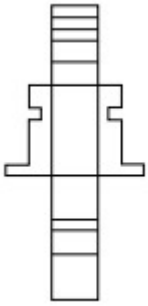


1. 
2. 
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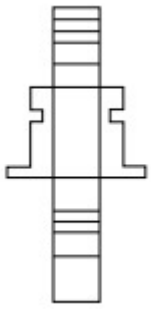
Correct. 2

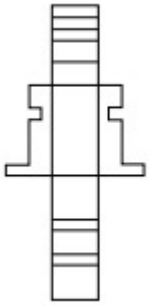
Q4. Which one of the answer figures shows the correct view of the 3–D problem figure after the problem figure is opened up ?

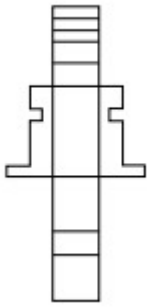


1. 

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2. 

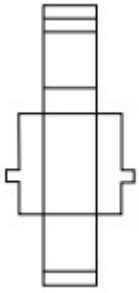
3. 

4. 

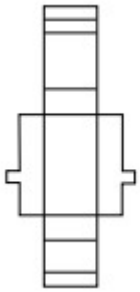
Correct. 1

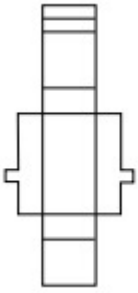
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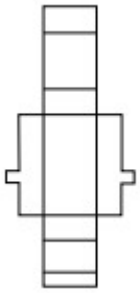


1. 

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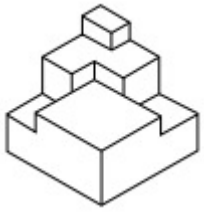
2. 

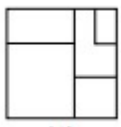
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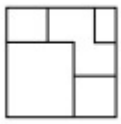
4. 

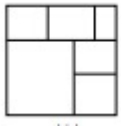
Correct. 2

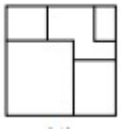
Q6. The 3-D figure shows the view of an object. Identify the correct top view from amongst the answer figures.



1. 

2. 

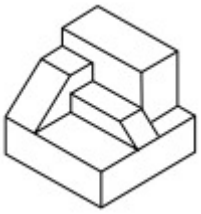
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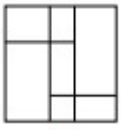
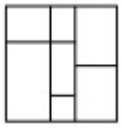
4. 

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Correct. 2

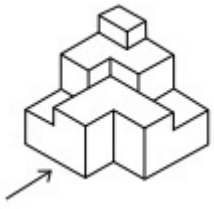
Q7. The 3-D figure shows the view of an object. Identify the correct top view from amongst the answer figures.

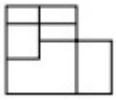
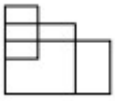
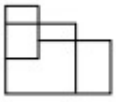
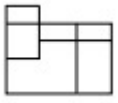


1. 
2. 
3. 
4. 

Correct. 3

Q8. The 3–D problem figure shows a view of an object. Identify the correct front view, from amongst the answer figures, looking in the direction of arrow.

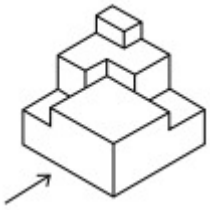


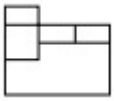
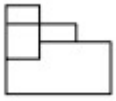
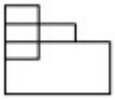
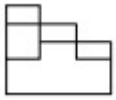
1. 
2. 
3. 
4. 

Correct. 3

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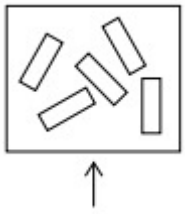
Q9. The 3–D problem figure shows a view of an object. Identify the correct front view, from amongst the answer figures, looking in the direction of arrow.



1. 
2. 
3. 
4. 

Correct. 2

Q10. The problem figure shows the top view of objects. Looking in the direction of the arrow, identify the correct elevation, from amongst the answer figures.

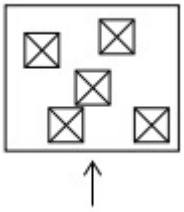


1. 
2. 
3. 
4. 

Correct. 3

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Q11. The problem figure shows the top view of objects. Looking in the direction of the arrow, identify the correct elevation, from amongst the answer figures.



1. 

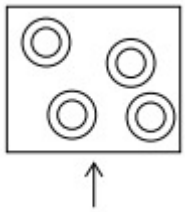
2. 

3. 

4. 

Correct. 2

Q12. The problem figure shows the top view of objects. Looking in the direction of the arrow, identify the correct elevation, from amongst the answer figures.



1. 

2. 

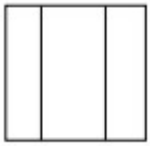
3. 

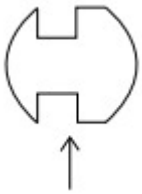
4. 

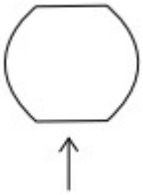
Correct. 1

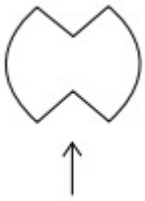
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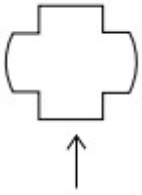
Q13. The problem figure shows the elevation of an object. Identify the correct top view from amongst the answer figures.



1. 

2. 

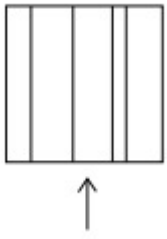
3. 

4. 

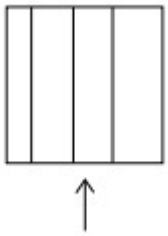
Correct. 2

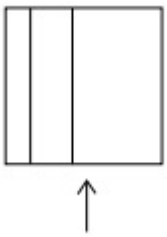
Q14. The problem figure shows the elevation of an object. Identify the correct top view from amongst the answer figures.

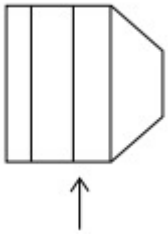


1. 

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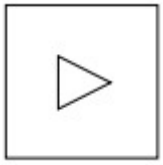
2. 

3. 

4. 

Correct. 2

Q15. Find the odd figure out of the problem figures given below.

1. 

2. 

3. 

4. 

Correct. 4

Q16. Which color is obtained by mixing red and yellow colors ?
1. Purple
2. Pink
3. Orange

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4. Brown

Correct. 3

Q17. Temperature of the Earth due to the 'Greenhouse Effect' :
1. Increases
2. Decreases
3. Remains constant
4. Keeps increasing/decreasing

Correct. 1

Q18. Gol Gumbaj of Bijapur is :
1. A Fort
2. A Mausoleum
3. A Palace
4. A Mosque

Correct. 2

Q19. IGBC stands for :
1. International Great Beautiful City
2. Indian Green Building Council
3. Indian Great Building Center
4. Indian Government Biological Center

Correct. 2

Q20. What is Venice famous for ?
1. Canals
2. Mountains
3. Valleys
4. Springs

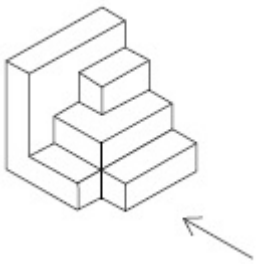
Correct. 1

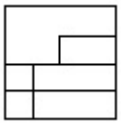
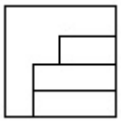
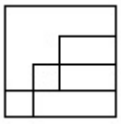
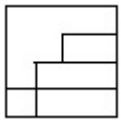
Q21. Pyramids are located in :
1. Rome
2. Egypt
3. Greece
4. Ethiopia

Correct. 2

Q22. 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.

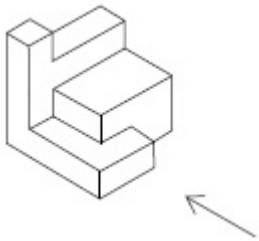
AglaSem Admission

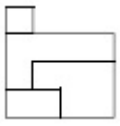
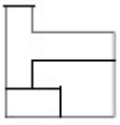
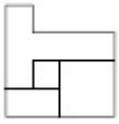
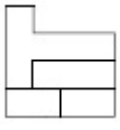


1. 
2. 
3. 
4. 

Correct. 4

Q23. 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.



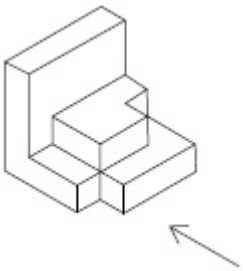
1. 
2. 
3. 
4. 

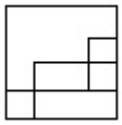
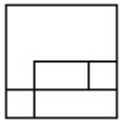
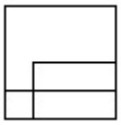
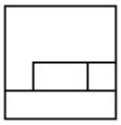
Correct. 2

Q24. Directions : The 3-D figure shows the view of an object. Identify the correct front view in the

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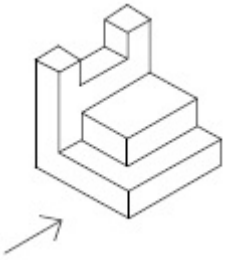
direction of the arrow, from amongst the answer figures.

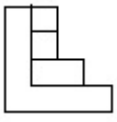
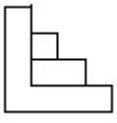
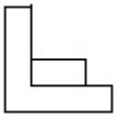
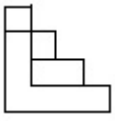


1. 
2. 
3. 
4. 

Correct. 2

Q25. Directions: The 3-D figure shows the view of an object. Identify the correct top view from amongst the answer figures.

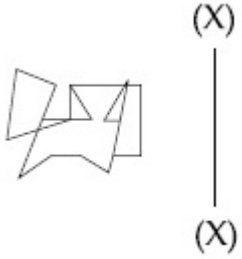


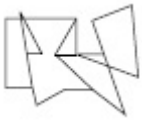
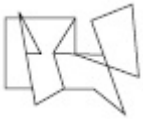
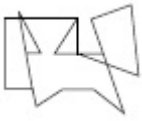
1. 
2. 
3. 
4. 

Correct. 3

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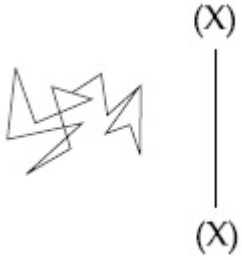
Q26. Directions : Which one of the answer figure is the correct mirror image of the problem figure with respect to X-X?



1. 
2. 
3. 
4. 

Correct. 4

Q27. Directions : Which one of the answer figure is the correct mirror image of the problem figure with respect to X-X?



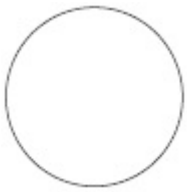
1. 
2. 
3. 
4. 

Correct. 3

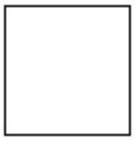
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Q28. Directions : Find the odd figure out of the answer figures given below:

1. 

2. 

3. 

4. 

Correct. 2

Q29. Directions: One of the following answer figure is hidden in the problem figure in the same size and direction Select the correct one.



1. 

2. 

3. 

4. 

Correct. 2

Q30. What does the abbreviation ISRO stand for amongst the following?
1. Indian Studies and Result Office
2. International Settlements and Relief Organization
3. Indian Space Research Organization
4. International Sea and Rain Office

Correct. 3

Q31. Frame structure in high rise building pertains to which one of the following?

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

Correct. 2

Q32. A byte is which one of the following ?
1. A unit of digital memory
2. An act of an acrobat
3. A group of stars
4. A unit of sound

Correct. 1

Q33. Which one of the following is a primary color?
1. Green
2. Orange
3. Red
4. Purple

Correct. 3

Q34. Chajjas above windows are meant to protect the building from which of the following ?
1. Sun
2. Birds
3. Typhoon
4. Wind

Correct. 1

Q35. A small lift for carrying small loads only is known as which of the following ?
1. A Deaf Bearer
2. A Dump Waiter
3. A Jockey Boy
4. A Push Upper

Correct. 2

Q36. Parquet flooring is usually made of which of the following ?
1. Granite
2. Marble
3. Cement
4. Wood

Correct. 4

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Q37. The fort in Hyderabad is known as which of the following ?
1. Bahubali
2. Golconda
3. Siladhari
4. Virbanda

Correct. 2

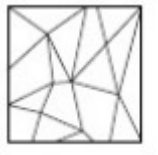
Q38. The Sas Bahu Temple is located in which of the following ?
1. Red Fort
2. Jhansi Fort
3. Gwalior Fort
4. Jaipur Fort

Correct. 3

Q39. The Lotus Temple is located in which one of the following city ?
1. New Delhi
2. Nagpur
3. Kanpur
4. Lucknow

Correct. 1

Q40. Directions : One of the following answer figures is hidden in the problem figure in the same size and direction. Select the correct one.



1. 
2. 
3. 
4. 

Correct. 3

Q41. Directions : One of the following answer figures is hidden in the problem figure in the same size and direction. Select the correct one.

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1. 

2. 

3. 

4. 

Correct. 1

Q42. Directions : One of the following answer figures is hidden in the problem figure in the same size and direction. Select the correct one.



1. 

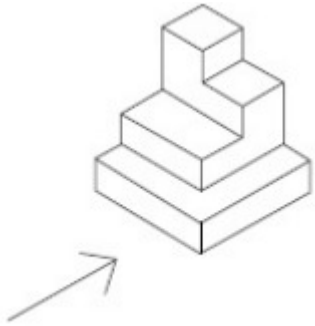
2. 

3. 

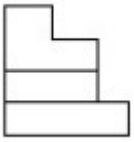
4. 

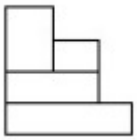
Correct. 4

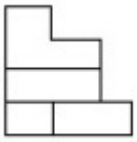
Q43. Directions : The 3D figure shows the view of an object. Identify the correct front view looking in the direction of the arrow, from amongst the answer figures.

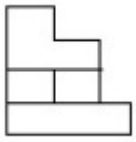


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1. 

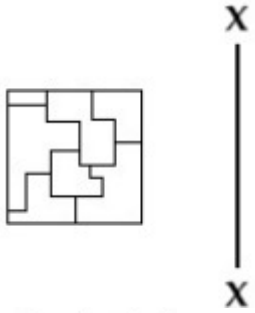
2. 

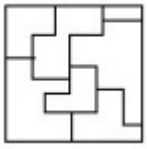
3. 

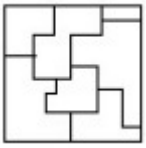
4. 

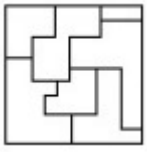
Correct. 1

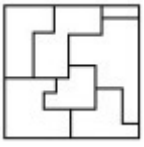
Q44. Directions : The 3D figure shows the view of an object. Identify the correct front view looking in the direction of the arrow, from amongst the answer figures.



1. 

2. 

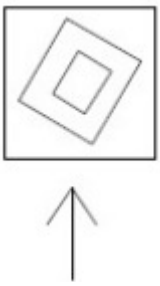
3. 

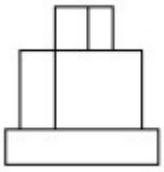
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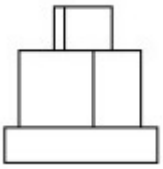
Correct. 2

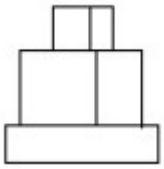
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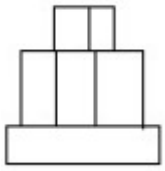
Q45. Directions : The problem figure shows the top view of an object. Identify the correct elevation from amongst the answer figures looking in the direction of the arrow.



1. 

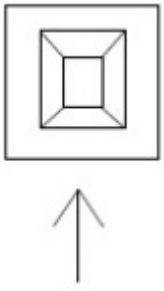
2. 

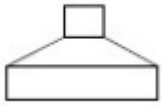
3. 

4. 

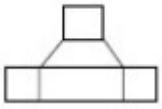
Correct. 3

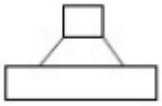
Q46. Directions : The problem figure shows the top view of an object. Identify the correct elevation from amongst the answer figures looking in the direction of the arrow.

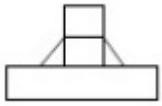


1. 

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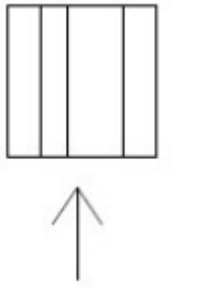
2. 

3. 

4. 

Correct. 3

Q47. 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.



1. 

2. 

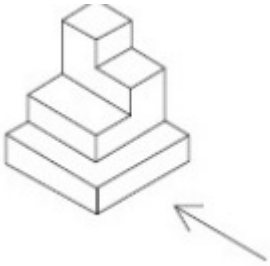
3. 

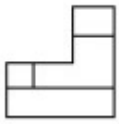
4. 

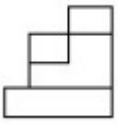
Correct. 1

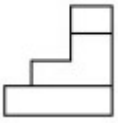
Q48. Directions : The 3D figure shows the view of an object. Identify the correct side view looking in the direction of the arrow, from amongst the answer figures.

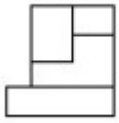
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1. 

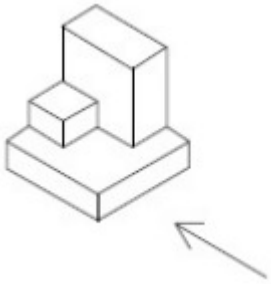
2. 

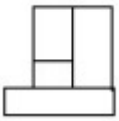
3. 

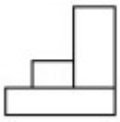
4. 

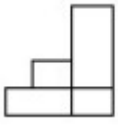
Correct. 3

Q49. Directions : The 3D figure shows the view of an object. Identify the correct side view looking in the direction of the arrow, from amongst the answer figures.

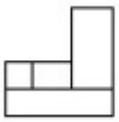


1. 

2. 

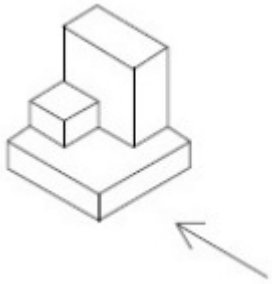
3. 

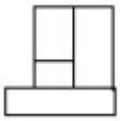
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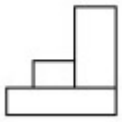
4. 

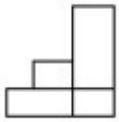
Correct. 2

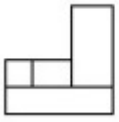
Q50. Directions : The 3D figure shows the view of an object. Identify the correct side view looking in the direction of the arrow, from amongst the answer figures.



1. 

2. 

3. 

4. 

Correct. 1

Drawing

1. Design an appropriate pattern for a curtain for a small girl's room. Draw and color it.

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

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