

- For $0 < x < \pi$, the sum of the solutions of the equation $4\left(\frac{1}{2}\sin x + \frac{1}{4}\sin^2 x + \frac{1}{8}\sin^3 x + \dots\right) = 2^{\frac{2}{3}}$ is:
 - $\frac{\pi}{3}$
 - $\frac{2\pi}{3}$
 - $\frac{\pi}{2}$
 - π
- A rod AB of length 4 units rests against a vertical wall with A on the horizontal floor. P is a point on AB such that AP:PB = 2:1. If the rod slides down along the wall in a vertical plane, then the point $P(x, y)$ moves on the curve:
 - $9x^2 + 36y^2 = 64$
 - $36x^2 + 9y^2 = 64$
 - $9x^2 + 36y^2 = 16$
 - $36x^2 + 9y^2 = 16$
- If $\int \sqrt{\frac{\cos(x-\theta)}{\cos(x+\theta)}} dx = \alpha \sin^{-1}\left(\frac{\sin x}{\cos \theta}\right) + \beta \log_e |\cos x + \sqrt{\cos^2 x - \sin^2 \theta}| + C$, where C is a constant of integration and $\frac{\pi}{6} < \theta < \frac{\pi}{4}$, then $\alpha \sin \theta + \beta \cos \theta$ is equal to:
 - $\cos 2\theta$
 - 1
 - 0
 - $\sin 2\theta$
- $\lim_{x \rightarrow 0} \frac{1}{x^2} (e^{x^2} - \cos \frac{x}{2})$ is equal to:
 - $\frac{9}{8}$
 - $\frac{9}{4}$
 - $\frac{3}{2}$
 - $\frac{5}{8}$
- Let $f(x) = \max\{x^2, x^3\}$ for all $x \in R$. Then which of the following is NOT true?
 - $f'(-\frac{1}{2}) + f'(\frac{1}{8}) + f'(\frac{3}{2}) = 6$
 - f is continuous for all x .
 - f is not differentiable exactly at two points in R
 - f is not differentiable exactly at one point in R.
- Which of the following is equivalent to $p \leftrightarrow q$?
 - $(\sim p \wedge \sim q) \vee (p \vee q)$
 - $(p \wedge q) \vee (\sim p \wedge \sim q)$
 - $(p \vee q) \vee (\sim p \vee \sim q)$
 - $(p \wedge q) \vee (p \vee q)$
- Let the distinct numbers a, b, c the p^{th}, q^{th} and r^{th} terms of a geometric progression of positive terms. Then the angle between the vectors $\vec{u} = (\log_e a^2)\hat{i} + (\log_e b^2)\hat{j} + (\log_e c^2)\hat{k}$ and $\vec{v} = (q-r)\hat{i} + (r-p)\hat{j} + (p-q)\hat{k}$ is:
 - $\frac{\pi}{4}$
 - $\frac{\pi}{3}$
 - 0
 - $\frac{\pi}{2}$
- If $I = \int_0^1 \tan^{-1}(\sqrt{x} + 1) dx, J = \int_0^1 \frac{\sqrt{x} dx}{x+2\sqrt{x^2}}$, then the value of $2I + J$ is equal to:
 - $2\tan^{-1}(2) - \frac{\pi}{2}$
 - $2\tan^{-1}(2)$
 - $2\tan^{-1}(\frac{1}{2})$
 - $\tan^{-1}(2)$
- A line perpendicular to the line $4x = 3y$ is a tangent to the parabola $y^2 = 3x + 1$ at a point P on it. If S is the focus of the parabola, then the equation of the line SP is:
 - $24x + 5y = 10$
 - $8x + y = 6$
 - $24x + 7y = 10$
 - $24x - y = 26$
- Let α and β be the roots of the quadratic equation $x^2 + \sqrt{3}x + 1 = 0$. Then $\alpha^{2022} + \beta^{2022}$ is equal to:
 - $-\sqrt{3}$
 - 0
 - 2
 - 2
- Let $A(1, 2)$ and $B(3, 6)$ are two points on a circle of radius R, whose one of the diameters is along the line $2x - y + 4 = 0$. Then R^2 is equal to:
 - 17
 - $\frac{41}{5}$
 - $\frac{31}{5}$
 - $\frac{37}{3}$
- The domain of the function, $f(x) = \sqrt{\frac{\log_{0.6}|x-2|}{|x|}}$ is:
 - $(0, 1) \cup (2, 3]$
 - $[1, 2) \cup [3, \infty)$
 - $(-\infty, 0) \cup [1, 2)$
 - $[1, 2) \cup (2, 3]$
- If a line $px + qy = 12$ is a tangent to the ellipse $4x^2 + 9y^2 = 16$, then pq can NOT be equal to:
 - 23
 - 21
 - 29
 - 26
- Let $y = y(x)$ be the solution of the differential equation $x \frac{dy}{dx} = (2x + 3)e^x + xy, x > 0$. If $y(e) = (2e + 3)e^e$, then $\frac{d^2y}{dx^2} - \frac{dy}{dx}$ at $x = 1$ is equal to:
 - 23
 - 21
 - 29
 - 26

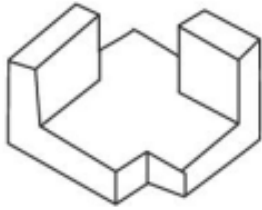
- a. e b. $3e$ c. $2e$ d. 0
15. If $A = \begin{pmatrix} 0 & 0 & 2 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$, then:
- a. $A^{12} = 2A^6$ b. $A^6 = 2A^3$ c. $2A^6 = A^3$ d. $A^{12} = 4A^6$
16. The sum of the series $\frac{1}{6} + \frac{5}{6^2} + \frac{19}{6^3} + \dots + \frac{3^{10}-2^{10}}{3^{10}\cdot 2^{10}}$ is:
- a. $\frac{(511)\cdot 3^{10} + 2^9}{6^{10}}$ b. $1 + \frac{2^9-3^{10}}{6^{10}}$ c. $\frac{(255)\cdot 3^{10} + 2^9}{6^{10}}$ d. $\frac{511}{2^{10}}$
17. The sum of all values of λ , for which the system of equations
- $$x + y + z = 1$$
- $$x + 2y + 4z = \lambda$$
- $$x + 4y + 10z = \lambda^2$$
- Has infinitely many solutions, is:
- a. 3 b. -2 c. 2 d. -3
18. If the angle between the line $\frac{x+1}{1} = \frac{y-1}{2} = \frac{z+2}{-1}$ and the plane $P: 2x - y - \lambda z + 4 = 0, \lambda > 0$, is $\sin^{-1}\left(\frac{1}{9\sqrt{6}}\right)$, then the distance of the point $(-1, 1, -2)$ from the plane P is:
- a. $\frac{2}{9}$ b. $\frac{2}{3}$ c. 1 d. $\frac{3}{2}$
19. The domain of the function $f(x) = \tan^{-1}(\sqrt{x^2 + x - 2}) + \sec^{-1}(x^2 - 5x + 3)$ is:
- a. $\left(-\infty, \frac{5-\sqrt{17}}{2}\right] \cup [1, 4] \cup \left[\frac{5+\sqrt{17}}{2}, \infty\right)$ b. $(-\infty, -2] \cup [1, \infty)$
- c. $[1, 4] \cup \left[\frac{5+\sqrt{17}}{2}, \infty\right)$ d. $(-\infty, -2] \cup [1, 4] \cup \left[\frac{5+\sqrt{17}}{2}, \infty\right)$
20. Let f be a non-zero polynomial function such that $f(3x) = f'(x)f''(x)$. Then the value of $f(6)$ is:
- a. 324 b. 108 c. 648 d. 136

Mathematics Section B

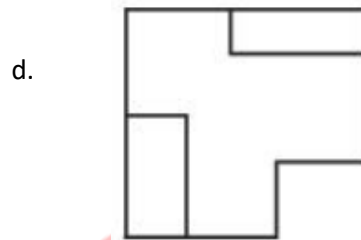
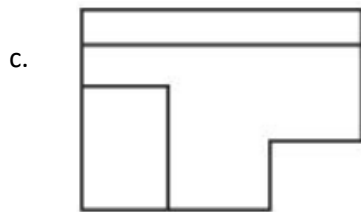
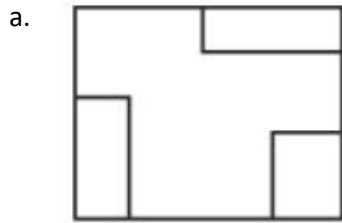
- Number of real roots of the equation $\sqrt{x+2} - \sqrt{x-2} = \sqrt{4x-1}$ is _____.
- If the area (in sq.units) of the region bounded by the curve $y = |x-2| + |2x-3| + |3x-4|$ and the line $y = 3$ is A, then $12A$ is equal to _____.
- The coefficient of $a^4b^6c^6$ in the expansion of $(ab+bc+ca)^8$ is _____.
- Three fair dice are thrown. The number of ways to obtain a total of 11 is _____.
- If a plane, that contains the line $\vec{r} = (1, -1, 1) + \lambda(2, 3, -6), \lambda \in R$, passes through the point $(2, 0, 2)$ and is at a distance d from the origin, then the value of $73d^2$ is _____.
- Between 1 and 31, n numbers have been inserted in such a way that the resulting sequence is an A.P. If the ratio of $(n-1)^{th}$ and 7^{th} inserted numbers is 9: 5, then n is equal to _____.
- The sum of absolute maximum and absolute minimum values of the function $f(x) = |4x^2 + 3x - 10| + x^2 - 2x + 5, x \in [-3, 1]$ is _____.
- Three numbers are randomly picked from the set $\{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$ one after another without replacement. If p be the probability that the smallest of these three numbers is less than 4, then $18p$ is equal to _____.
- If the mean of the numbers 3, 4, a, b, 10 is 6 and their standard deviation is $\sqrt{6.8}$, then $a^3 + b^3$ is equal to _____.
- The number of ordered pairs (a, b) such that the function $f(x) = 4x^3 - (3a+2b)x^2 + 2abx$ is decreasing in $\left[\frac{3}{2}, \frac{5}{3}\right]$ and increasing in $R - \left[\frac{3}{2}, \frac{5}{3}\right]$, is _____.

Aptitude Test:

- The 3D figure shows the view of an object. Identify the correct top view, form amongst the answer figure.



Options:

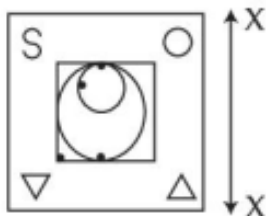


2. 'Rani Ki Vav' is an example of:

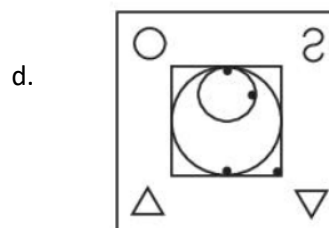
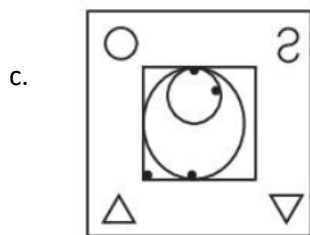
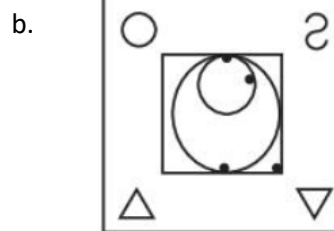
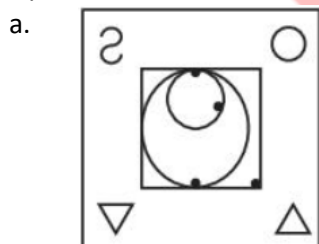
Options:

- a. Fort b. Haveli c. Stepwell d. Temple

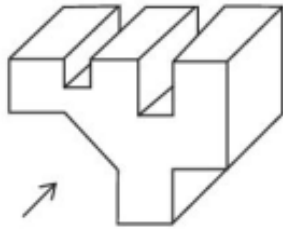
3. Which one of the answer figure is correct mirror image of problem figure with respect to $X - X'$?



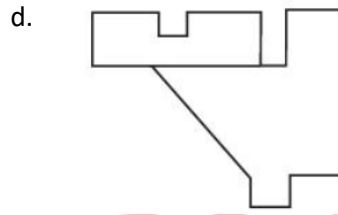
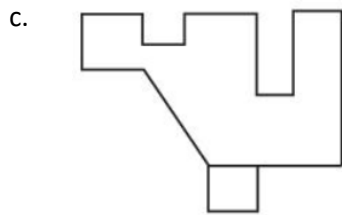
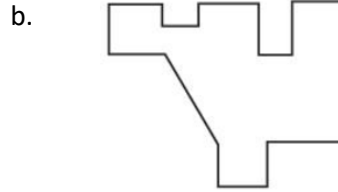
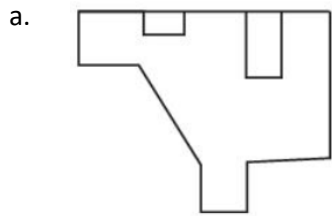
Options:



4. The 3D figure shows the view of an object. Identify the correct view looking in the direction of arrow, from the given answer figure's.



Options:

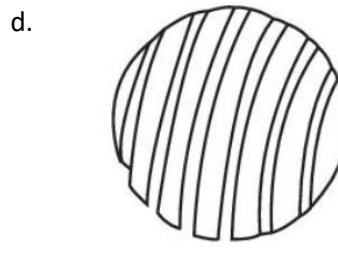
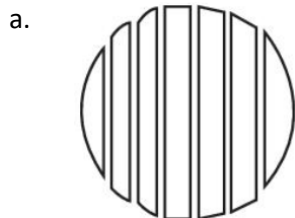


5. Bhagalpur is known for:

- a. Tea b. Cotton c. Rice d. Silk

6. A tennis ball is cut according to the pattern of the grooves of a screw. Which of the following is the correct output:

Options:

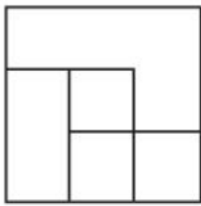


7. The 3D figure shows the view of an object. Identify the correct top view, amongst the answer figure's

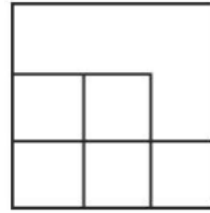


Options:

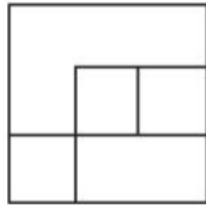
a.



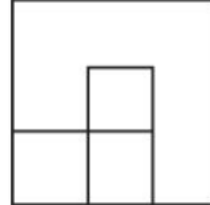
b.



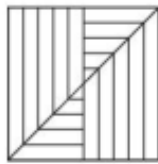
c.



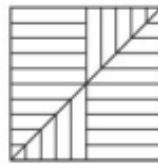
d.



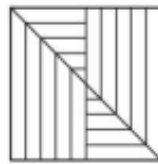
8. Which one of the answer figure will complete the sequence of the problem figure? Choose correct one.



(a)



(b)



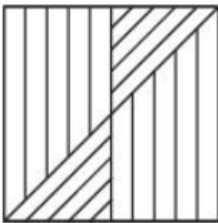
(c)

?

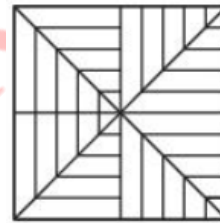
(d)

Options

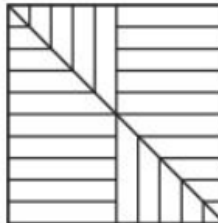
a.



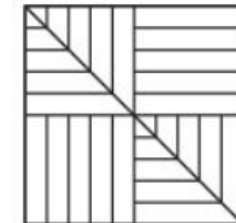
b.



c.



d.



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

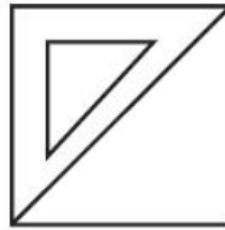


Options:

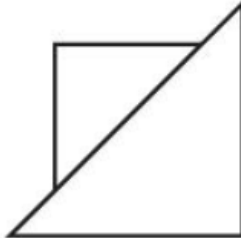
a.



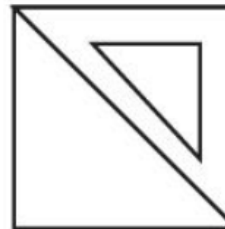
b.



c.



d.



10. 'Kyoto protocol' summit was held in which country?

a. Japan

b. China

c. Malaysia

d. Korea

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



Options:

a.



b.



c.



d.



12. Match List – I with List – II:

List – I

a) Dubai

b) London

c) New York

d) Kuala Lumpur

List – II

(I)



(II)



(III)



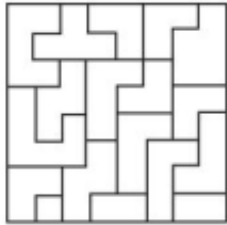
(IV)



Options

- a. (A) – (I), (B) – (III), (C) – (IV), (D) – (II) b. (A) – (IV), (B) – (III), (C) – (II), (D) – (I)
 c. (A) – (II), (B) – (I), (C) – (III), (D) – (IV) d. (A) – (III), (B) – (II), (C) – (IV), (D) – (I)

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



Options

- a.  b. 
 c.  d. 

14. Who has designed the 'India Habitat Center' building situated at New Delhi?

- a. Joseph Allein Stein b. B.V. Doshi
 c. Charles Correa d. I.M. Pei

15. Match List – I with List – II:

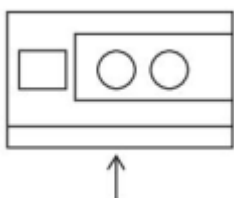
- | | |
|----------------------|-------------------|
| List – I | List – II |
| (A) Jod Gumbaz | (I) Mahabalipuram |
| (B) Cave temples | (II) Madhurai |
| (C) Rangnatha temple | (III) Bijapur |
| (D) Minakshi temple | (IV) srirangam |

- a. (A) – (I), (B) – (IV), (C) – (III), (D) – (II) b. (A) – (III), (B) – (II), (C) – (IV), (D) – (I)
 c. (A) – (IV), (B) – (I), (C) – (III), (D) – (II) d. (A) – (III), (B) – (I), (C) – (IV), (D) – (II)

16. Lingraj temple is situated in:

- a. Puri b. Bhubaneshwar c. Cuttack d. Konark

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



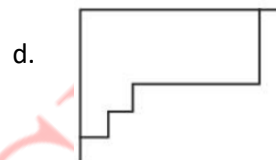
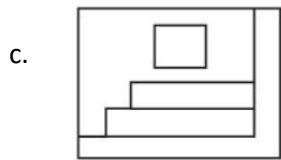
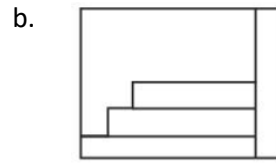
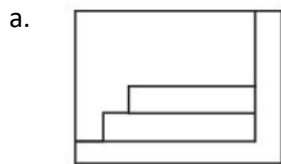
Options:

- a.  b. 
 c.  d. 

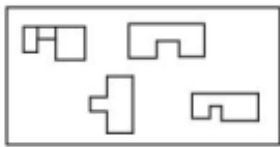
18. The 3D figure shows the view of an object. Identify the correct view looking in the direction of arrow, from the answer figure's.



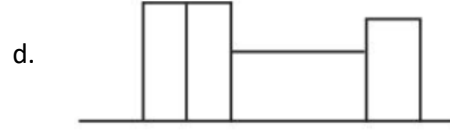
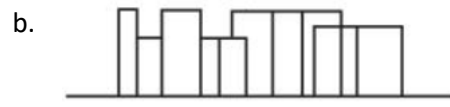
Options:



19. The problem figure shows the top view of an object. Identify the correct elevation looking in the direction of arrow, amongst the answer figure's.



Options:

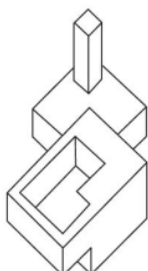


20. Originally there were five 'Jantar Mantars' (Architectural Observatories) constructed by 'Raja Jai Singh'. Which out of those got destroyed in the 19th century?

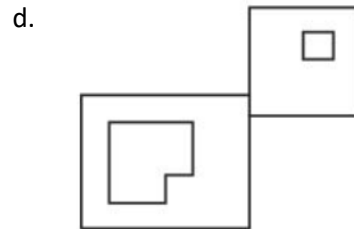
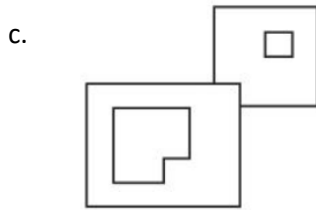
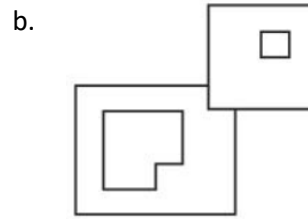
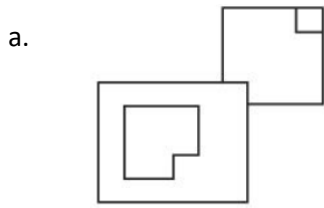
- a. Jantar Mantar at Mathura
b. Jantar Mantar at Varanasi

- c. Jantar Mantra at Delhi
d. Jantar Mantar at Ujjain.

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



Options:



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



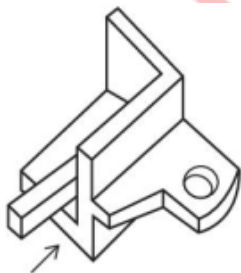
Options:



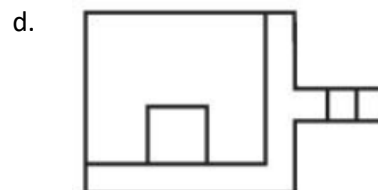
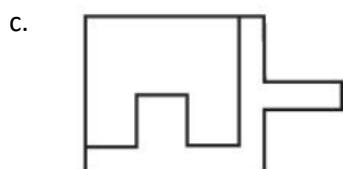
23. Where is 'Junagadh fort' choose the correct option amongst the following?

- a. Jodhpur b. Bikaner c. Udaipur d. Jaisalmer

24. The 3D figure shows the view of an object. Identify the correct view looking in the direction of arrow, from answer figure's.

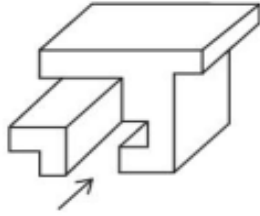


Options:



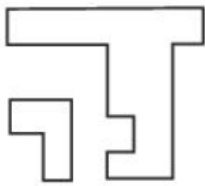
25. Monsoon first reach to which state of India?
 a. Gujarat b. Karnataka c. Kerala d. Maharashtra

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

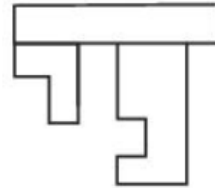


Options

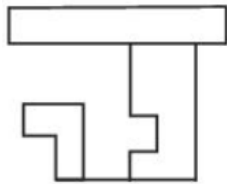
a.



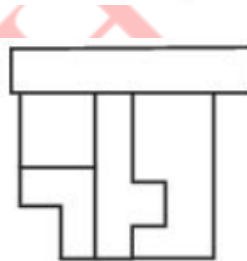
b.



c.



d.



27. The local term 'Barsati' in a building mean.
 a. Mumty b. Parapet c. Canopy d. Balcony
28. Which one of the following terms is used to describe trade between two or more countries?
 a. Local trade b. Internal trade
 c. External trade d. International trade

29. Match List – I with List – II:
 List – I

List – II

(A) Empire state building

(I)



(B) Opera House

(II)



(C) Hagia Sophia

(III)



(D) Guggenheim Museum

(IV)

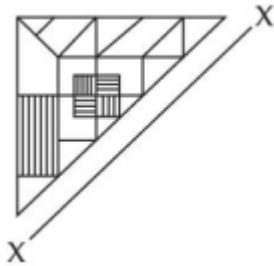


Options:

- a. (A) – (II), (B) – (I), (C) – (IV), (D) – (III)
 c. (A) – (IV), (B) – (I), (C) – (II), (D) – (III)

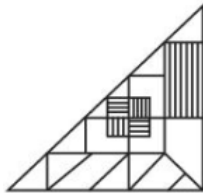
- b. (A) – (I), (B) – (II), (C) – (IV), (D) – (III)
 d. (A) – (III), (B) – (IV), (C) – (I), (D) – (II)

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



Options:

a.



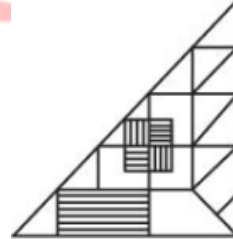
b.



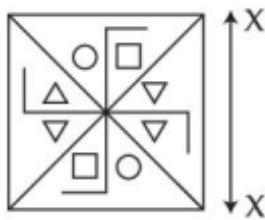
c.



d.

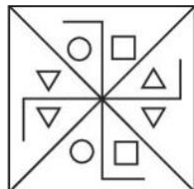


31. Which of the answer figure is correct mirror image of the problem figure with respect to $X - X$?

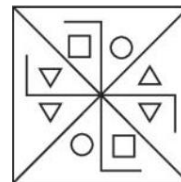


Options:

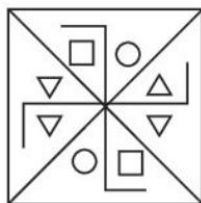
a.



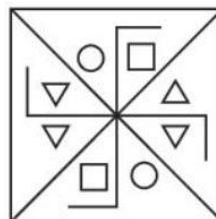
b.



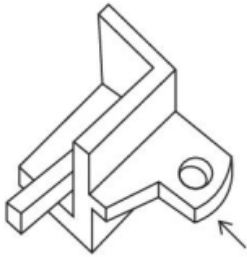
c.



d.

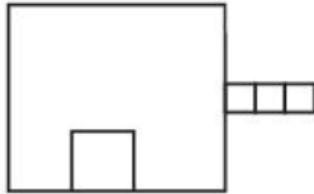


32. The 3D figure shows the view of an object. Identify the correct view looking in the direction of arrow amongst the answer figures.

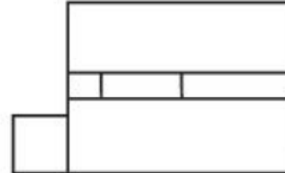


Options:

a.



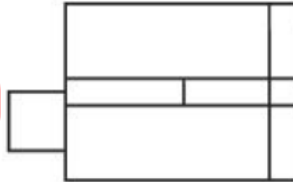
b.



c.



d.



33. Porcelain is a product made up of:

a. Steel

b. Timber

c. Clay

d. Stone

34. Match List – I with List – II:

List – I: Name of the cities/ towns where traditional Ghats are situated.

List –II: Name of the river on which traditional Ghats are constructed.

List – I

List – II

(A) Maheshwar, MP

(I) Ganga

(B) Kolhapur, Maharashtra

(II) Shipra

(C) Ujjain, MP

(III) Narmada

(D) Varanasi, UP

(IV) Panchganga

Options:

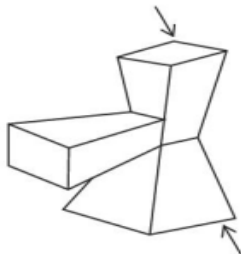
a. (A) – (I), (B) – (II), (C) – (III), (D) – (IV)

b. (A) – (III), (B) – (IV), (C) – (II), (D) – (I)

c. (A) – (IV), (B) – (III), (C) – (II), (D) – (I)

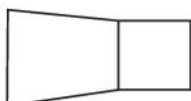
d. (A) – (IV), (B) – (II), (C) – (III), (D) – (I)

35. The 3D figure shows the view of an object. Find out the odd shape from the answer figures which is not related to 3D figure.

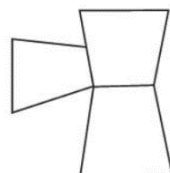


Options:

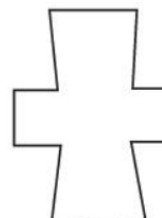
a.



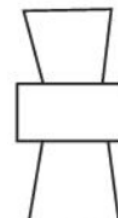
b.



c.



d.



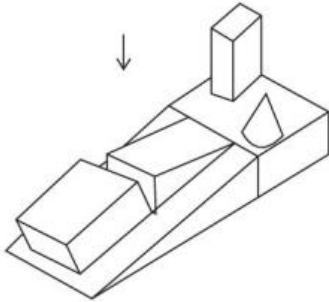
36. Match List – I with List – II:

List – I		List – II
(A) Jaisalmer	-	(I) Pink city
(B) Jodhpur	-	(II) Golden city
(C) Jaipur	-	(III) Lake city
(D) Udaipur	-	(IV) Blue city

Options:

- | | |
|---|---|
| a. (A) – (II), (B) – (IV), (C) – (III), (D) – (I) | b. (A) – (IV), (B) – (II), (C) – (III), (D) – (I) |
| c. (A) – (III), (B) – (I), (C) – (IV), (D) – (II) | d. (A) – (II), (B) – (IV), (C) – (I), (D) – (III) |

37. The 3D figure shows the view of an object. Identify the correct view in the direction of the arrow, from the answer figure's.



Options:

- | | |
|----|----|
| a. | b. |
| c. | d. |

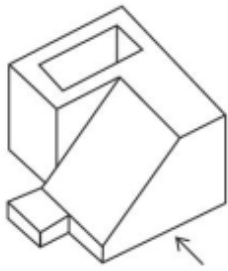
38. The 3D figure shows the view of an object. Identify the correct view when figure opened up amongst the answer figures.



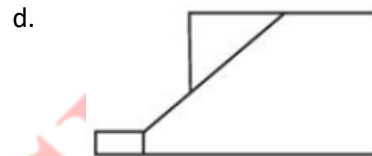
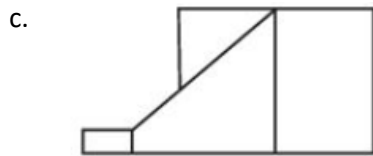
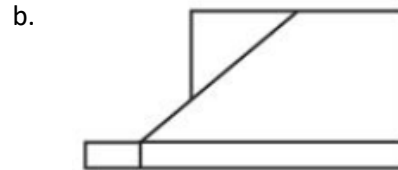
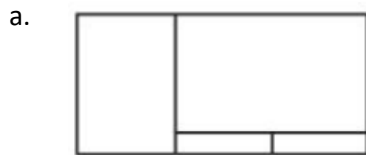
Options:

- | | |
|----|----|
| a. | b. |
| c. | d. |

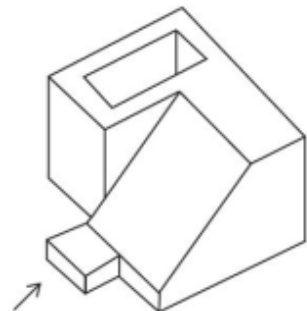
39. The 3D figure shows view of an object. Identify the correct view looking in the direction of arrow, from the answer figure's.



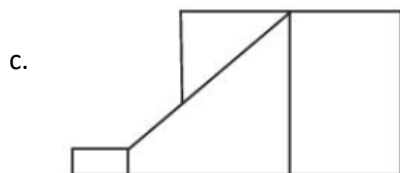
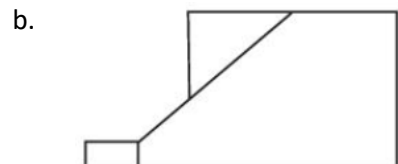
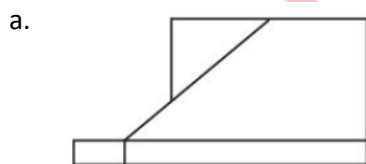
Options:



40. The 3D figure shows view of an object, looking in the direction of arrow, identify the correct elevation from the answer figures.



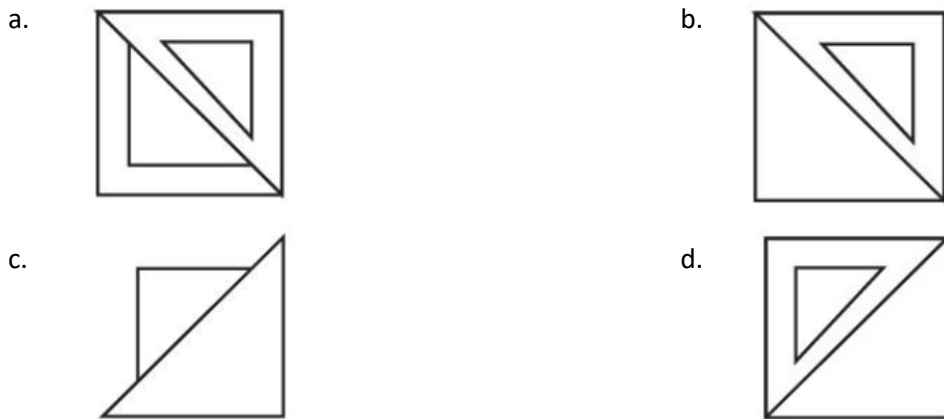
Options:



41. The 3D figure shows the view of an object. Identify the correct view looking in the direction of arrow, from answer figure's.



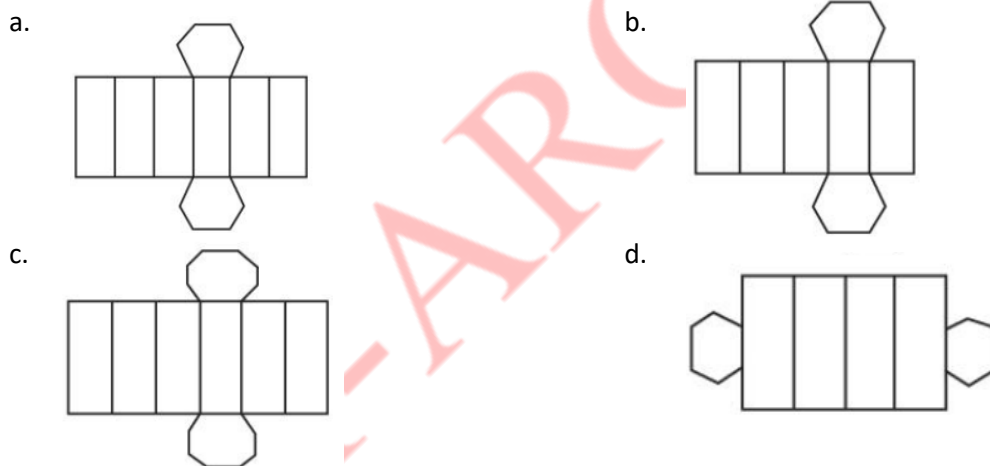
Options:



42. The 3D figure shows the view of an object. Identify the correct view when the figure opened up from amongst the answer figures.



Options:



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



Options:



44. Proposed 'Central Vista' project is located in which city?

- a. Mumbai b. New Delhi c. Varanasi d. Lucknow

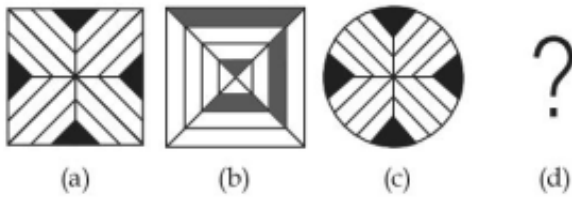
45. X SUCCESS Y Mirror the words along $X - Y$ axis and choose the correct option amongst the following.

- a. SNCCES b. 22ECCN2 c. 2UCCES2 d. 2NCCES2

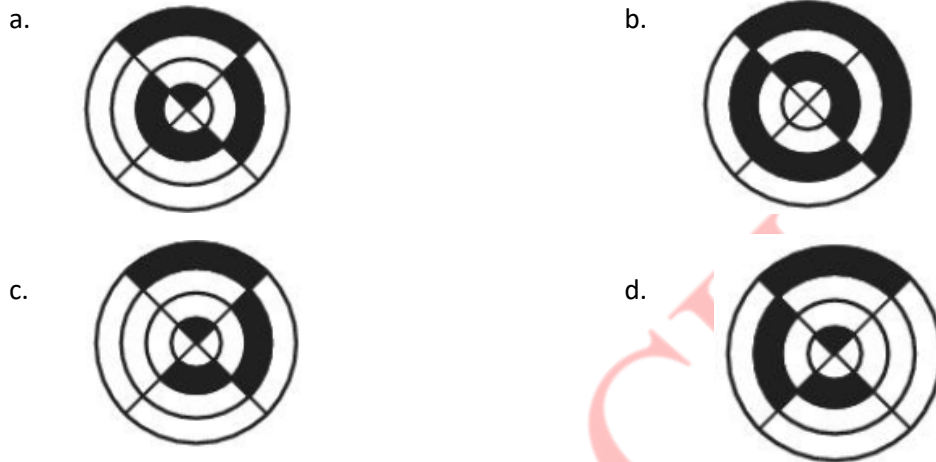
46. What was Delhi's old name?

- a. Old Delhi b. Shahpur Jat c. Shahajahanabad d. Shahjahanpur

47. Which one of the answer figure will complete the sequence of the problem figure? Choose the correct one.



Options:



48. 'Al - Khazneh' the treasury is located in:

- a. Turkey b. Jordan c. UAE d. Saudi - Arabia

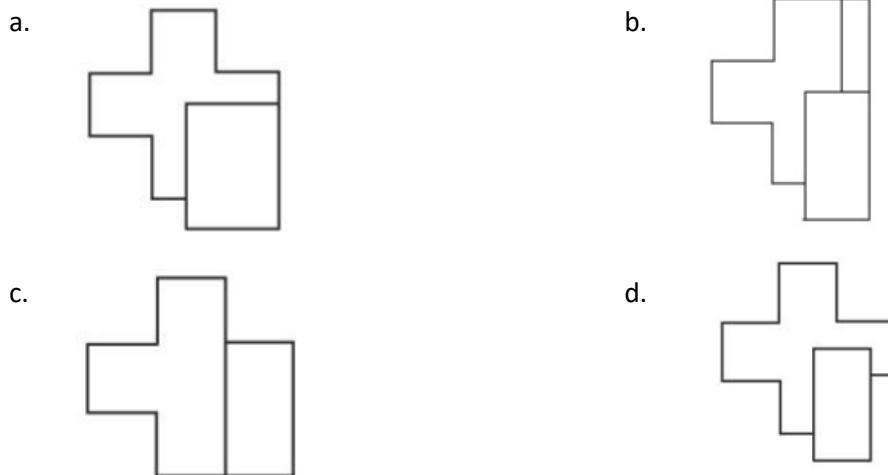
49. Which is the largest monestry in India?

- a. Dharamshala b. Tawang c. Leh d. Labrang

50. The 3D figure shows the view of an object. Identify the correct top view, amongst the answer figure's.



Options:



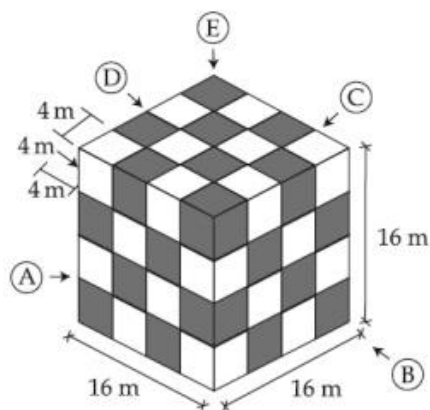
Planning

Q1. In the tribal arts of India, the traditional tribal Bastar art is famous around all over the world. This art is practiced by tribal of Bastar region of India and is known throughout the world for their unique art works. The tribal communities of Bastar have been protecting this rare art from generation to generation, but in absence of publicity it is restricted to weekly 'haat' and markets. This art is made by conventional tools rather than using the modern excellent machines. Bastar art can be divided mainly into wood work, bamboo art, soil art and metal arts. Wood art works are mainly used in wooden material to make Bastar culture, festivals, creatures of gods, statues of gods and goddesses and decorations. Bamboo art is made with bamboo sheets, chairs, living room, table, baskets, mats and home furnishings are made. In soil art, the statues of goddesses, decorative utensils, vases, pots and household furnishings are made. In the metal arts, artifacts of copper and tin mixed metal are made, mainly in which statues of goddesses, idols of worship, idols of tribal of culture and home furnishings are made.

With reference to the passage above, choose the correct statement.

- a. Bastar art is a traditional art of Bihar
- b. Bastar statues are widely worshipped in Bastar region.
- c. Bastar art is available in metal, wood, bamboo and soil.
- d. Bastar art is machine made and rarely done through conventional tools.

Q2. The drawing below shows a building block $16\text{ m} \times 16\text{ m}$ Black and White surfaces are cubes visible on all four vertical surfaces and top surface, except the base. Calculate the total volume of black cubes that are visible from all sides except the base. Find the correct answer.



- a. 1536 cu.m.
- b. 1664 cu.m.
- c. 2048 cu.m.
- d. 4028 cu.m.

Q3. In defining a settlement as 'urban', which one of the following is the correct option?

- a. 75% of female workers to be engaged in non- agricultural pursuits.
- b. 75% of workers to be engaged in non – agricultural pursuits.
- c. 75% of male workers to be engaged in non – agricultural pursuits.
- d. 75% workers to be engaged in agricultural pursuits.

Q4. Statement I:

The thirteenth Five – Year Plan of India is being prepared for 2020 – 2025.

Statement II:

Since its inception in 1951, twelve five year plans have been prepared.

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

- a. Both statement I and statement II are correct.
- b. Statement I is incorrect but statement II is correct.
- c. Statement I is correct but statement II is incorrect.
- d. Both statement I and statement II are incorrect.

Q5. Which of the following is not the correct inference from the table?

Year	Delhi	Greater Mumbai	Kolkata	Hyderabad
1991	9.4	12.5	10.97	4.1
2001	13.8	16.3	13.1	5.65
2011	16.8	18.4	14.0	7.5

- a. Population growth rate was the highest for Delhi between 1991-2001
- b. Population of Greater Mumbai is almost half of the total population of all cities in 2011.
- c. Total population of all cities in 2011 has doubled from total population in 1991.
- d. Kolkata is growing at the slowest rate amongst all four cities.

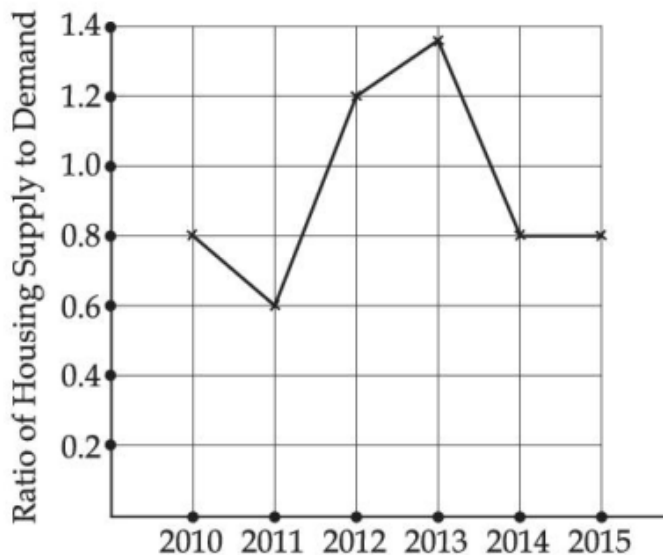
Q6. Find the correct sequence in descending order for the hierarchy of plans with reference to the area.

- a. Regional Plan, Zonal Plan, Master Plan, Layout Plan.
- b. Master Plan, Regional Plan, Layout Plan, Zonal Plan.
- c. Zonal Plan, Layout Plan, Master Plan, Regional Plan.
- d. Regional Plan, Master Plan, Zonal Plan, Layout Plan.

Q7. To show proportion of an item to the whole, the preferred chart type would be:

- a. Pie chart
- b. Scatter Plot
- c. Gantt chart
- d. Pine diagram

Q8.



The above graph gives the ratio of housing supply to housing demand.

How many years was the demand for housing more than its supply?

- a. 1 year
- b. 4 years
- c. 2 years
- d. 5 years

Q9. Which country organised the 'Earth Summit' in 1992?

- a. Brazil
- b. Sweden
- c. United Kingdom
- d. U.S.A.

Q10. Which type of soil is available in the largest quantity in India? Choose the correct answer.

- a. Black (Regular) soil
- b. Red soil
- c. Alluvial soil
- d. Mountain soil

Q11. Central government programme known as HRIDAV primarily focuses on:

- a. Highland resources
- b. Hill towns
- c. Heritage cities
- d. Highways, roads and infrastructure.

Q12. Which is the most populated city in the world?

- a. Shanghai
- b. Sao Paulo
- c. Tokyo
- d. Delhi

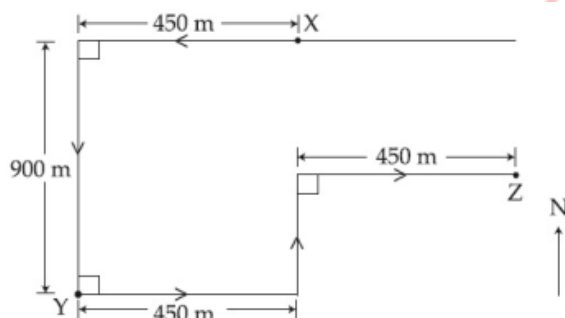
Q13. Population of four cities from 1991 – 2011 (in millions).

Year	Delhi	Greater Mumbai	Kolkata	Hyderabad
1991	9.4	12.5	10.97	4.1
2001	13.8	16.3	13.1	5.65
2011	16.8	18.4	14.0	7.5

Which city has grown at the highest rate between 2001 - 2011?

- a. Hyderabad
- b. Delhi
- c. Kolkata
- d. Greater Mumbai

Q14.



John starts from his home at point X and follows the path shown in the diagram to reach the bank at point Y and then to his office at point Z.

Which of the following statements holds true?

- a. John's bank is located west – south – west of his home.
- b. John's home is south – east of his office.
- c. John's home is north – west of his office.
- d. John's bank is located north – east of his home.

Q15. First printing press of Europe was named:

- a. Vernacular Press
- b. Erasmus Printing Press
- c. The Gutenberg press
- d. Britannica Press

Q16. Match List – I with List –II

List – I

- (A) Paris
- (B) New York
- (C) Singapore
- (D) Kuala Lumpur

List – II

- (I) Petronas Tower
- (II) Gardens by the Bay
- (III) Louvre Museum
- (IV) Times Square

Choose the correct answer from the options given below:

- a. (A) – (II), (B) – (I), (C) – (III), (D) – (IV)
- b. (A) – (III), (B)- (IV), (C) – (II), (D) – (I)
- c. (A) – (II), (B) – (III), (C) – (IV), (D) – (I)
- d. (A)- (III), (B) – (IV), (C) – (I), (D) – (II)

- Q17. In which city did "Lottery Committee" initiate town planning during 18th century?
 a. Amritsar b. Calcutta c. Delhi d. Bombay
- Q18. With how many states does the state of Madhya Pradesh share its border with?
 a. 4 b. 6 c. 7 d. 5
- Q19. Past weather report for city X reveals that in the month of August, whenever the temperature was 38°C or above, the humidity level was 85% or higher. From this statement it can be concluded that the report which is not accurate for city X, for the month of August is:
 a. 37°C, 82% b. 39°C, 85% c. 38°C, 84% d. 36°C, 80%
- Q20 Assertion A:
 The U.S. has hegemony in the world based on its military power.
 Reason R:
 The U.S. absorbs about 65% of India's total experts in the software sector.
 In the light of above statements, choose the most appropriate answer from the options given below:
 a. (A) is correct but (R) is not correct
 b. Both (A) and (R) are correct but (R) is not the correct explanation of (A)
 c. Both (A) and (R) are correct and (R) is the correct explanation of (A)
 d. (A) is not correct but (R) is correct.
- Q21. How many towns are there in India based on 2011 census?
 a. 3000 b. 4727 c. 5687 d. 7935
- Q22. Which of these cities are depicted in Charles Dickens's, "A Tale of two cities"?
 (A) London (B) New York (C) Venice (D) Paris (E) Warsaw
 Choose the correct answer from the options given below:
 a. (C) and (D) only b. (A) and (B) only
 c. (B) and (E) only d. (A) and (D) only
- Q23. Which among the following states in India is more prone to earthquake?
 a. Kerala b. West Bengal c. Madhya Pradesh d. Assam
- Q24. Burning wood for household cooking and heating is hazardous to health. Wood smoke contains dangerous toxins that can cause change in human cells. As such there must be some legislation to regulate use of wood stoves and open – air fires.
 Which of the following statements, if true, provide/s support for the above argument?
 (A) Dangerous toxins is higher in vehicle exhaust than in wood smoke.
 (B) Smoke produced by coal – burning stoves is more toxic than wood – burning stoves.
 (C) In areas where the legislation is to be implemented, the concentration of smoke results in poor air – quality
 (D) No significant beneficial effect on air quality by banning of wood for cooking
 (E) In areas where the legislation is to be implemented, wood is used by more than 50% households.
 Choose the most appropriate answer from the options given below:
 Options:
 a. (C) and (E) only b. (C) only c. (B) only d. (A) and (B) only
- Q25. Arrange the following ratio scales in the ascending order:
 (A) 1 : 4, 000 (B) 1 : 5, 000 (C) 1 : 30, 000 (D) 1 : 250 (E) 1 : 750

a. (A) → (B) → (C) → (D) → (E)

b. (C) → (A) → (B) → (D) → (E)

c. (C) → (B) → (A) → (E) → (D)

d. (D) → (E) → (A) → (B) → (C)

Drawing

Q1. Draw a proportionate sketch of given reference image with black and white rendering techniques of your choice. Picture should fit in given space for this answer.



OR

Create a wall magic for a metro station using triangles of any size and overall panel size of your choice. The theme of magic is 'Environment' use colours to make the mosaic attractive and meaningful.

Q2. Consider yourself a fish in the aquarium that is in a room and a girl is standing near the aquarium and playing with the fish. Create the view of the room according the eye of fish.

OR

Create picture with fish/ fishes, a girl, boat, farmers, tractor, trees and plants.