JEE PAPER 2 MOCK TEST 4

INSTRUCTIONS FOR CANDIDATES

1. Fill up the necessary information in the space provided on the cover
2. The total duration of this test (Part 1 Part II and Part III) is 3 hours. There are 25 questions in Part I, 50 questions in Part II and 2 questions in Part III.
3. There is No Negative Marking.
4. You may attempt the questions in any order you prefer.
5. Please check for the completeness of the Question Booklet
6. Mark all answers in the booklet only. For Section 3, ask for additional papers.
7. Rough work, if any, is to be done on the Question Booklet only. No separate sheet will be provided/used for rough work.
8. Calculator, Mobile or any Electronic Gadgets, etc., are not permitted inside the examination hall.
9. Candidates seeking, receiving and/or giving assistance during the test will be disqualified.
10. The right to exclude any question(s) from final evaluation rests with the Examining authority.

QUESTION BOOKLET

NAME: _____

MOBILE NUMBER: _____

DATE: _____

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Section 1: Mathematics : Questions 1 – 25

1. If $(x + iy)^2 = 7 + 24i$, then a value of $(7 + \sqrt{576})^{1/2} - (7 - \sqrt{576})^{1/2}$ is:
   A) −3i
   B) 2i
   C) 6
   D) −6i

2. 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:
   A) equal to R
   B) equal to R− {1}
   C) equal to {1}
   D) an empty set

3. For all real numbers x, y and z, the determinant
   $\begin{vmatrix} 2x & xy - xz & y \\ 2x + z + 1 & xy - xz + yz - z^2 & 1 + y \\ 3x + 1 & 2(xy - xz) & 1 + y \end{vmatrix}$ is equal to:
   A) zero
   B) (x−y) (y−z) (z−x)
   C) (x−yz) (y−z)
   D) (y−xz) (z−x)

4. If the sum of the first 15 terms of the series $3 + 7 + 14 + 24 + 37 + \ldots$. is 15 k, then k is equal to:
   A) 122
   B) 81
   C) 119
   D) 126

5. $\lim_{x \to 0} \log \frac{\sin 7x + \cos 7x}{\sin 3x}$ equals :
   A) $\frac{7}{3}$
   B) $\frac{14}{3}$
   C) $\frac{1}{3}$
   D) $\frac{1}{3}$ * log 7

6. If the function f: R → R, defined by

f(x) = ax if x < 2 and f (x) = $ax^2 - bx + 3$ if $x \geq 2$ is differentiable, then the value of $f'(-3) + f'(3)$ is equal to:

A) 3 B) 4

C) 15/2 D) 0

7. The sum of the abscissae of the points where the curves, $y = kx^2 + (5k+3)x + 6k + 5$, $(k \in R)$, touch the x-axis, is equal to:

A) $\frac{-19}{3}$ B) $\frac{-10}{3}$

C) $\frac{-5}{3}$ D) $\frac{4}{3}$

8. Water is running into an underground right circular conical reservoir, which is 10 m deep and radius of its base is 5 m. If the rate of change in the volume of water in the reservoir is $\frac{3\pi}{2}$ m^3 /min., then the rate (in m/min) at which water rises in it, when the water level is 4 m, is:

A) $\frac{3}{8}$ B) $\frac{1}{8}$

B) $\frac{1}{4}$ D) $\frac{3}{2}$

9. The integral $\int \frac{(x+2)\,dx}{(x^2+3x+3)\sqrt{x+1}}$ is equal to:

A) $\frac{1}{\sqrt{3}} \tan^{-1} \frac{x}{\sqrt{3(x+1)}} + C$ B) $\frac{2}{\sqrt{3}} \tan^{-1} \frac{x}{\sqrt{3(x+1)}} + C$

C) $\frac{2}{\sqrt{3}} \cot^{-1} \frac{x}{\sqrt{(x+1)}} + C$ D) $\frac{1}{\sqrt{3}} \cot^{-1} \frac{x\sqrt{3}}{\sqrt{(x+1)}} + C$

10. The integral $\int_{\frac{\pi}{24}}^{\frac{5\pi}{24}} \frac{dx}{1+\sqrt[3]{\tan 2x}}$ is equal to:

A) $\frac{\pi}{3}$ B) $\frac{\pi}{12}$

C) $\frac{\pi}{6}$ D) $\frac{\pi}{18}$

11. If the line, y=mx, bisects the area of the region $\{f(x,y) : 0 \leq x \leq 3/2 \;\&\; 0 \leq y \leq 1 + 4x - x^2\}$, then m equals:

A) $\frac{9}{8}$ B) $\frac{13}{3}$

C) $\frac{13}{6}$ D) $\frac{39}{16}$

12. The order and the degree of the differential equation of all ellipses with centre at the origin, major axis along x-axis and eccentricity $\frac{\sqrt{3}}{2}$ are, respectively:

A) 1, 1 B) 2, 1
C) 1, 2 D) 2, 2

13. If an equilateral triangle, having centroid at the origin, has a side along the line, $x + y = 2$, then the area (in sq. units) of this triangle is:

A) 6 B) $6\sqrt{3}$
C) $\frac{9\sqrt{3}}{2}$ D) $3\sqrt{6}$

14. The equation of the circle, which is the mirror image of the circle, $x^2 + y^2 - 2x = 0$, in the line, $y = 3 - x$ is:

A) $x^2+y^2 - 6x - 8y + 24 = 0$ B) $x^2+y^2 - 8x - 6y + 24 = 0$
C) $x^2+y^2 - 4x - 6y + 24 = 0$ D) $x^2+y^2 - 6x - 4y + 24 = 0$

15. The product of the perpendiculars drawn from the foci of the ellipse, $\frac{x^2}{9} + \frac{y^2}{25} = 1$ upon the tangent to it at the point $\left(\frac{3}{2}, \frac{5\sqrt{3}}{2}\right)$, is:

A) 9 B) 189/13
C) 18 D) $13\sqrt{3}$

16. Which one of the following points does not lie on the normal to the hyperbola, $\frac{x^2}{16} - \frac{y^2}{9} = 1$ drawn at the point $(8, 3\sqrt{3})$?

A) $(13, \frac{-1}{\sqrt{3}})$ B) $(12, \frac{1}{\sqrt{3}})$
C) $(11, \sqrt{3})$ D) $(10, \sqrt{3})$

17. If the shortest distance between the lines
$x + 2\lambda = 2y = -12z$,
$x = y + 4\lambda = 6z - 12\lambda$ is $4\sqrt{2}$ units, then a value of λ is:

A) 2 B) $\sqrt{2}$

C) $2\sqrt{2}$ D) $1/\sqrt{2}$

18. Two numbers are selected at random (without replacement) from the first six positive integers. If X denotes the smaller of the two numbers, then the expectation of X, is:

A) $\frac{14}{3}$ B) $\frac{13}{3}$

C) $\frac{7}{3}$ D) $\frac{5}{3}$

19. If A and B are two independent events such that $P(A) = \frac{3}{10}$ and P(A∪B) = $\frac{4}{5}$, then P (A∩B) is equal to:

A) $1/5$ B) $1/10$

C) $3/14$ D) $3/35$

20. A bag contains three coins, one of which has head on both sides, another is a biased coin that shows up heads 90% of the time and the third one is an unbiased coin. A coin is taken out from the bag at random and tossed. If it shows up a head, then the probability that it is the unbiased coin, is:

A) $5/12$ B) $5/24$

C) $1/3$ D) $3/8$

Numeric Entry Questions

Direction for question 21- 25: Each of the following questions an answer has to be filled in the box given.

21. If A and B be two finite sets such that the total number of subsets of A is 960 more than the total number of subsets of B, then n(A)−n(B) (where n(X) denotes the number of elements in set X) is equal to:

22. If λ_1 and λ_2 are the two values of λ such that the roots α and β of the quadratic equation, $\lambda(x^2-x) + x + 5 = 0$ satisfy $\frac{\alpha}{\beta} + \frac{\beta}{\alpha} + \frac{4}{5} = 0$, then $\frac{\lambda 1}{\lambda 2^2} + \frac{\lambda 2}{\lambda 1^2} =$

23. 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:

24. If the digits at ten's and hundred's places in $(11)^{2016}$ are x and y respectively, then the ordered pair (x, y) is equal to:

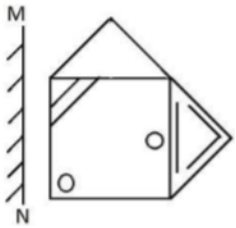
(,)

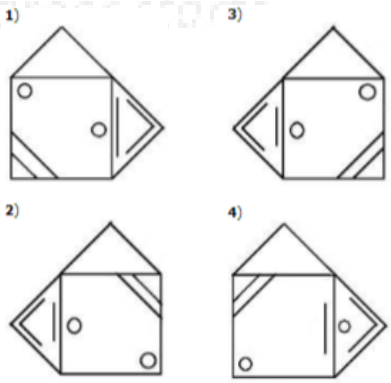
25. Let a_1, a_2, a_3, a_4, a_5 be a G.P. of positive real numbers such that the A.M. of a2 And a_4 is 117 and the G.M. of a_2 and a_4 is 108. Then the A.M. of a_1 and a_5 is:

Section 2: Aptitude: Questions 1 – 50

Q1. If a mirror is placed on the line MN, then which of the answer figures is the right image of the given figure?

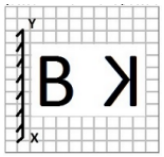
A) 1
B) 2
C) 3
D) 4

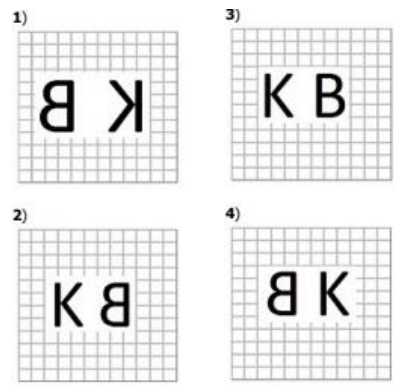




Q2. If a mirror is placed on the line MN, then which of the answer figures is the right image of the given figure?

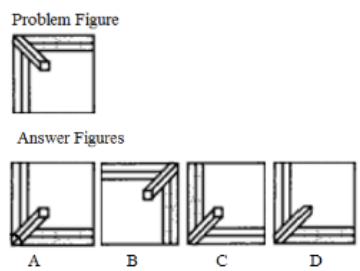
A) a
B) b
C) c
D) d





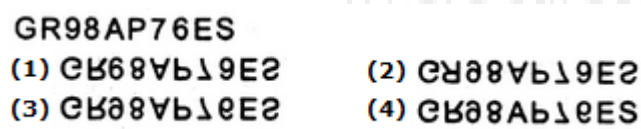
Q3. Choose the alternative which shows the correct water image of the number.

A) a
B) b
C) c
D) d



Q4. Find the water image of the object

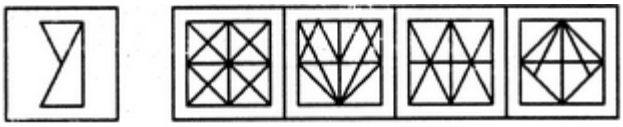
A) 1
B) 2
C) 3
D) 4



Q5. Find out the alternative figure which contains figure (X) as its part.

A) 1
B) 2
C) 3
D) 4

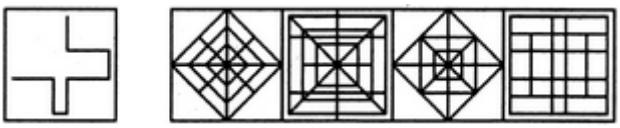
Q6. Find out the alternative figure which contains figure (X) as its part.



A) 1
B) 2
C) 3
D) 4

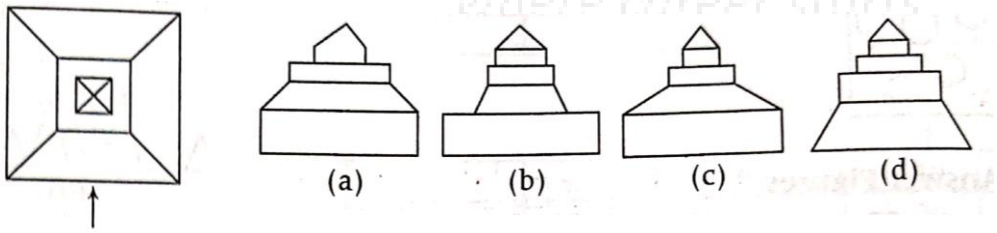
Q7. Find out the alternative figure which contains figure (X) as its part.

A) 1
B) 2
C) 3
D) 4



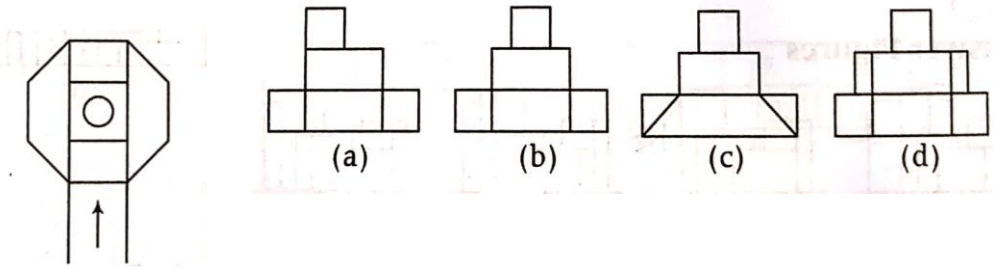
Q(8-10)- The problem figure shows top view of the object. Identify the correct elevation from amongst the answer figures looking in the direction of the arrow.

Q8. A) a
B) b
C) c
D) d



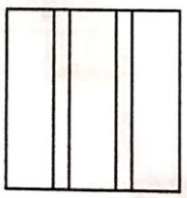
Problem Figure **Answer Figure**

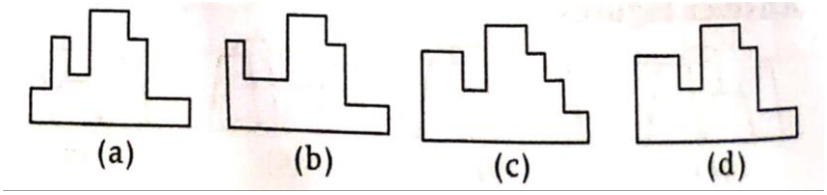
Q9. A) a
B) b
C) c
D) d



Problem Figure **Answer Figure**

Q10. A) a
B) b
C) c
D) d

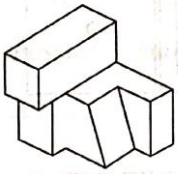




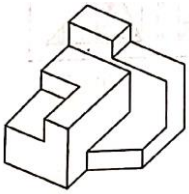
Problem Figure **Answer Figure**

Q(11-16)- In the following questions, count the number of faces of the given figures

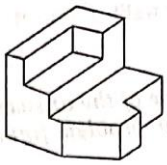
Q11. A) 10
B) 13
C) 12
D) 11



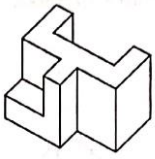
Q12. A) 16
B) 14
C) 15
D) 17



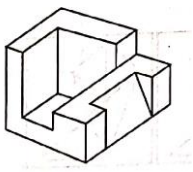
Q13. A) 15
B) 11
C) 12
D) 14



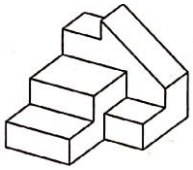
Q14. A) 14
B) 15
C) 12
D) 13



Q15. A) 13
B) 15
C) 16
D) 14

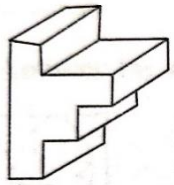


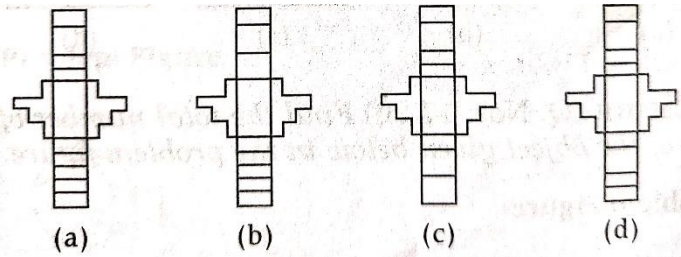
Q16. A) 13
B) 15
C) 16
D) 14



Q(17-20) Which one of the answer figures shows the correct view of the 3D problem figure after the problem figure is opened up?

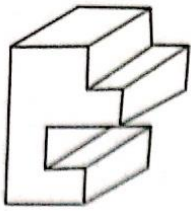
Q17. A) a
B) b
C) c
D) d

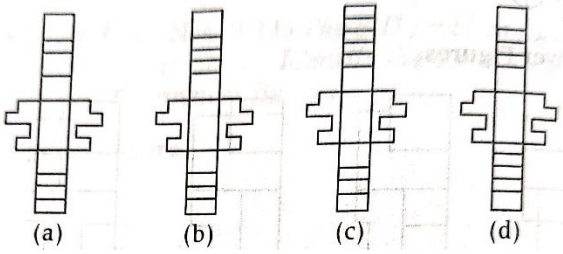




Problem Figure **Answer Figure**

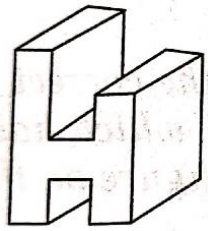
Q18. A) a
B) b
C) c
D) d

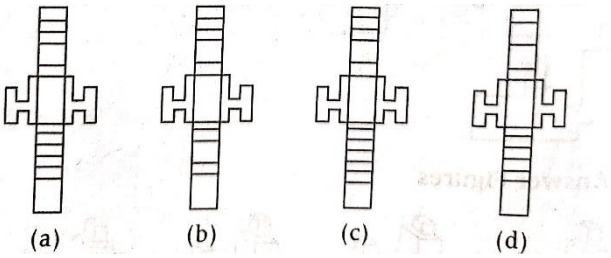




Problem Figure **Answer Figure**

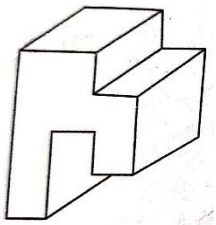
Q19. A) a
B) b
C) c
D) d

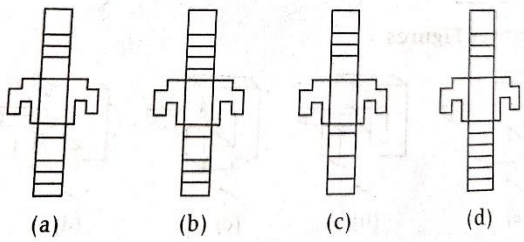




Problem Figure **Answer Figure**

Q20. A) a
B) b
C) c
D) d

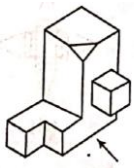


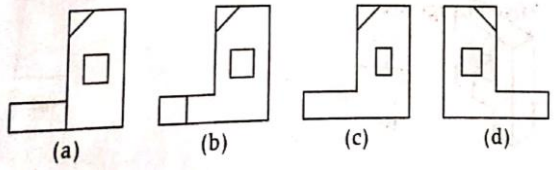


Problem Figure **Answer Figure**

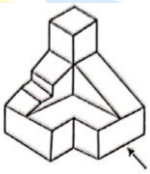
Q(21-25) The 3D problem figure shows an object. Identify the correct view from amongst the answer figures looking in the direction of the arrow.

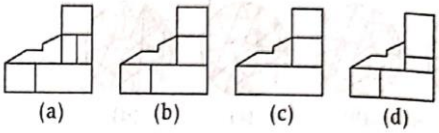
Q21. A) a
B) b
C) c
D) d



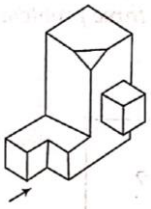


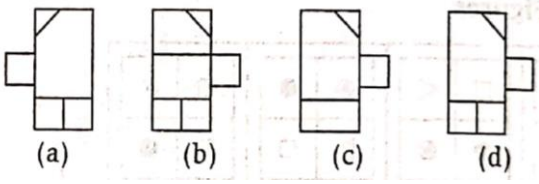
Q22. A) a
B) b
C) c
D) d



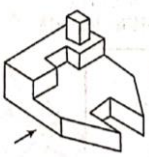


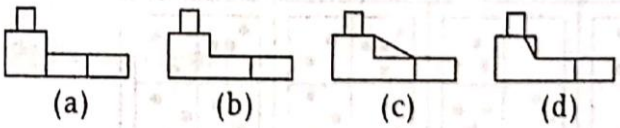
Q23. A) a
B) b
C) c
D) d



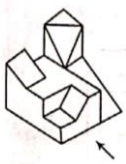


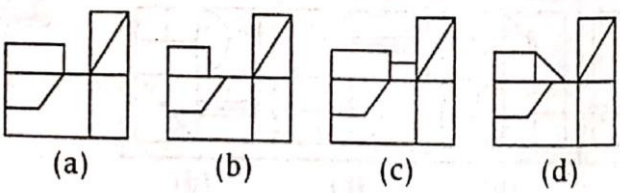
Q24. A) a
B) b
C) c
D) d





Q25 A) a
B) b
C) c
D) d





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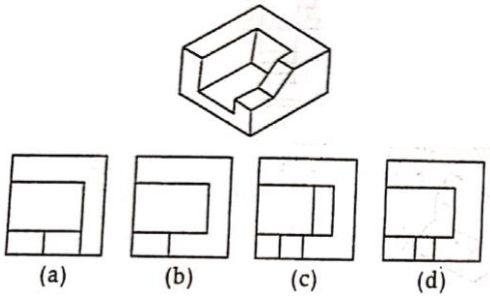
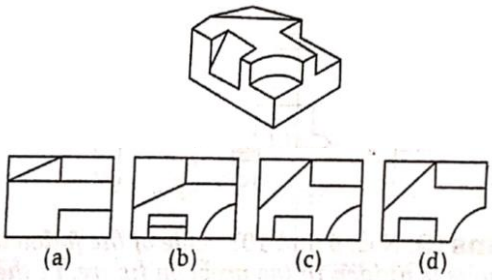
Q(26-30)- Choose the correct top view of the object

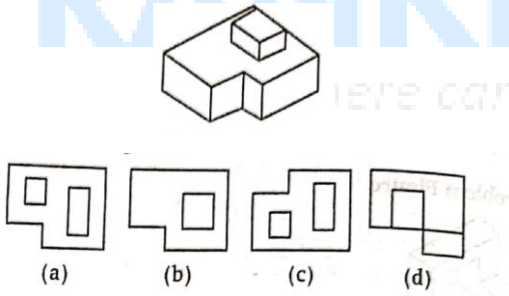
Q26. A) a
B) b
C) c
D) d



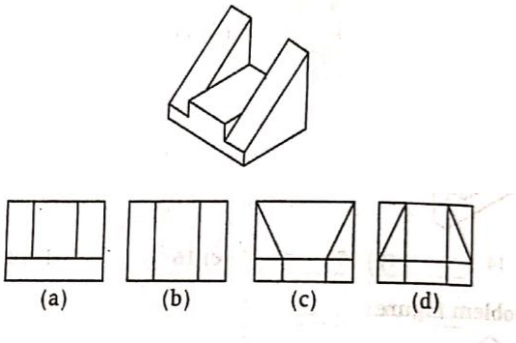
Q27. A) a
B) b
C) c
D) d



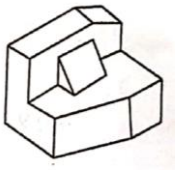
Q28. A) a
B) b
C) c
D) d

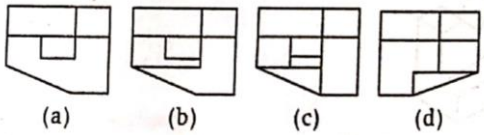


Q29. A) a
B) b
C) c
D) d



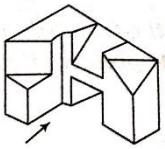
Q30. A) a
B) b
C) c
D) d

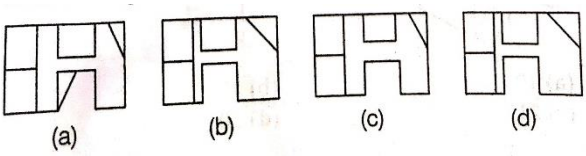




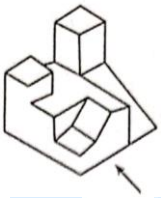
Q(31-35)- Choose the correct front view of the object, from the direction of the arrow

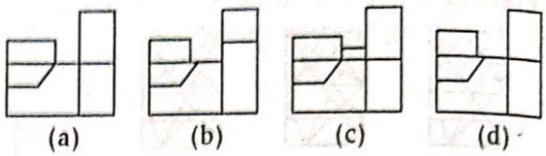
Q31. A) a
B) b
C) c
D) d



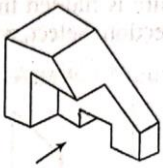


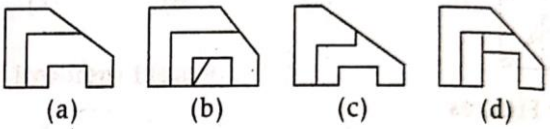
Q32. A) a
B) b
C) c
D) d



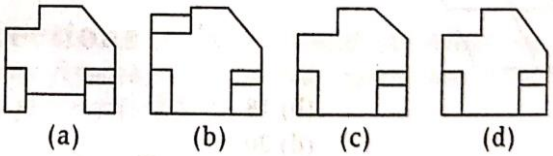


Q33. A) a
B) b
C) c
D) d

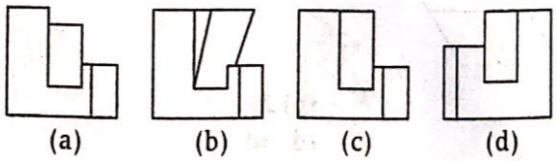




Q34. A) a
B) b
C) c
D) d



Q35. A) a
B) b
C) c
D) d



Q36. Brahadeeshwara temple at Tanjore was built by
A) Cholas B) Cheras
C) Pallavas D) Pandiyas

Q37. Illumination levels are measured in?

A) Volt B) Watt
C) Lux D) Decibel

Q38. As seen in Hagia Sophia, the transitional section between the dome and the rectangular base is a?

A) Pendentive B) vault
C) keystone D) nave

Q39. The art of designing plants, trees and water bodies?

A) Town Planning B) landscaping
C) Environmental Planning D) Horticulture

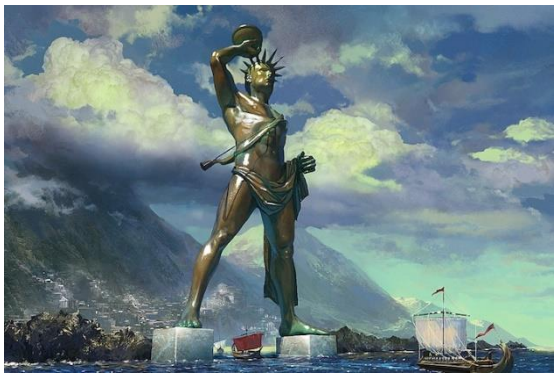
Q40. Which city is called “White City” of Rajasthan?

A) Ajmer B) Jaipur
C) Udaipur D) Jodhpur

Q41. Identify the given image?

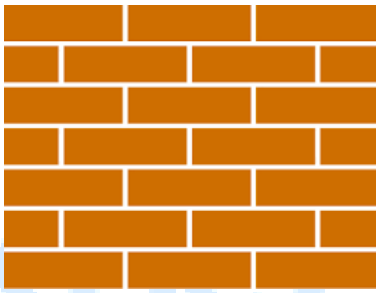
A) Taj Mahal B) Buland Darwaza
C) Humayun Tomb D) Gol Gumbaj

Q42. Identify the given image?



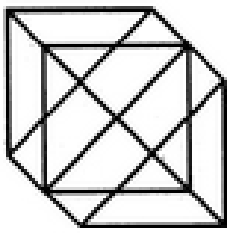
A) Ancient Colossus
B) Statue of Zeus
C) Statue of Liberty
D) None of the Above

Q43. Identify the displayed type of brick bonding?



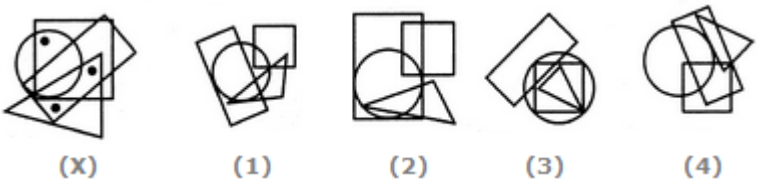
A) Stretcher Bond
B) English Bond
C) Header Bond
D) Flemish Bond

Q44. Find the number of triangles in the given figure.?



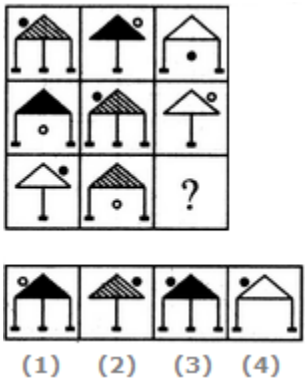
A) 18
B) 20
C) 24
D) 27

Q45. Select the figure which satisfies the same conditions of placement of the dots as in Figure-X.



A) 1
B) 2
C) 3
D) 4

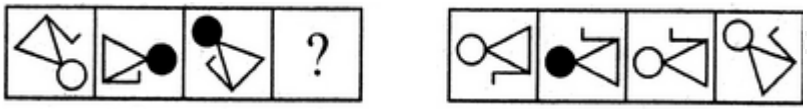
Q46. Select a suitable figure from the four alternatives that would complete the figure matrix.



A) 1 B) 2
C) 3 D) 4

Q47. Select a suitable figure from the Answer Figures that would replace the question mark (?).

Problem Figures: Answer Figures:



A) 1 B) 2
C) 3 D) 4

Q48. Select the alternative which represents three out of the five alternative figures which when fitted into each other would form a complete square.

A) 1,4,5 B) 2,3,4
C) 1,3,4 D) 2,3,5

Q49 & 50. The following questions are based on the information given below:

1. There is a cuboid whose dimensions are 4 x 3 x 3 cm.
2. The opposite faces of dimensions 4 x 3 are coloured yellow.

3. The opposite faces of other dimensions 4 x 3 are coloured red.
4. The opposite faces of dimensions 3 x 3 are coloured green.
5. Now the cuboid is cut into small cubes of side 1 cm.

Q49. How many small cubes have three faces colored?

A) 24 B) 10
C) 16 D) 8

Q50. How many small cubes will have only one face colored?

A) 10 B) 12
C) 14 D) 18

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Section 3: Drawing : Questions 1 & 2
General Instructions:

Question 1 & 2- Bond paper A-4 only pencil Sketches

Attach sheets for Answers

Q1. Scene. **(50 marks)**

You have entered a fantasy world along with one of your friends, where you have a dog grown to an elephant size and an elephant into a dog size. Similarly, a rose plant has grown into a coconut tree size and a coconut tree into a rose plant size.

Draw what you see.

Q2. Scene. **(50 marks)**

You live on 3rd floor of a community building where only facility of drinking water is a handpump. It is summer season and a lot of people have gathered in a queue around this pump to fetch water.

Draw what you see from balcony of your flat.

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----------End of Question Paper----------

Space for Rough Work

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