JEE Main 2022 Paper 2B (B.Planning) Jul 30 Shift 1 Question Paper

Conducted by the National Testing Agency (NTA)

Time Allowed: 3 Hours **B.Planning** **Maximum Marks: 400**

General Instructions

(i) This is **Paper 2B (B.Planning)** of **JEE (Main) 2022**, conducted by the National Testing Agency on **30 Jul 2022**.

(ii) The paper contains **105 questions**; attempt **100** as specified in the section table. The maximum score is **400 marks**.

(iii) Multiple choice questions have four options. Select one answer. Each correct answer carries **4 marks**; an incorrect answer carries **−1 mark**.

(iv) Numerical value questions carry **4 marks** for a correct answer and **−1 marks** for an incorrect answer. Unanswered questions carry **0 marks**.

(v) All Planning and Aptitude Test questions are compulsory.

(vi) In Mathematics Section B, attempt **any five of the ten** numerical value questions.

Section	Questions	To attempt	Marks
Mathematics Section A	20	20	80
Mathematics Section B	10	5	20
Aptitude Test	50	50	200
Planning	25	25	100

Mathematics Section A

1. 4 marks

Let f and g be two twice differentiable functions in $(-2, 2)$ such that

$$f(-1) = f(1) = 0,\ f\left(\frac{1}{2}\right) = 1,\ \text{and}$$

$$g\left(-\frac{3}{2}\right) = g\left(\frac{3}{2}\right) = g(0) = 0, g(1) = 1$$

Then, the minimum number of roots of the equation

$f(x)g''(x) + f''(x)g(x) + 2f'(x)g'(x) = 0$ in $(-2, 2)$ is :

(1) 2 (2) 4

(3) 3 (4) 5

---

2. 4 marks

Let $f : \mathbf{R} \to \mathbf{R}$ be a function defined as $f(x) = \alpha|x| + |\beta x - \gamma|$, where α, β, γ are distinct positive real numbers. Then, the maximum number of points at which $f(x)$ attains minima is equal to :

(1) 1 (2) 4

(3) 2 (4) 3

---

3. 4 marks

Which of the following logical statements is a tautology ?

(1) $p \Rightarrow \sim q$ (2) $p \Rightarrow (\sim p) \vee q$

(3) $(p \wedge q) \Rightarrow ((\sim p) \vee q)$ (4) $(p \wedge (\sim q)) \Rightarrow ((\sim p) \vee q)$

---

4. 4 marks

The area of the region

$S=\{(x, y) : 2x-x^2 \le y^2 \le 2x, x \le 2, x \le y\}$

is :

(1) $\frac{7}{4}-\frac{\pi}{4}$

(2) $\frac{2}{3}$

(3) $\frac{7}{6}-\frac{\pi}{4}$

(4) $\frac{5}{3}$

5. 4 marks

The area bounded by the parabola $x^2=12y$ and the line L, where L passes through the focus S of the parabola and meets the parabola at A′ and A with the condition that no point B exists on the axis of the parabola such that ASB is a right angle triangle with right angle at A, is :

(1) $9\sqrt{3}$

(2) 18

(3) 27

(4) 24

6. 4 marks

The area of the triangle whose two sides have the equations $2x-y=1$ and $x-2y=-1$ and whose centroid is (2, 2), is :

(1) $\frac{3}{2}$

(2) $\frac{5}{2}$

(3) 3

(4) $\frac{7}{2}$

7. 4 marks

The area of the region $A=\{(x, y) : x+2y\le 4\le (x-2)^2+(y-2)^2, x, y\ge 0\}$ is :

(1) $\frac{28}{5}-\pi-2\sin^{-1}\left(\frac{3}{5}\right)$

(2) $\frac{144}{25}-\pi-2\sin^{-1}\left(\frac{3}{5}\right)$

(3) $\frac{28}{5}-\pi+2\sin^{-1}\left(\frac{3}{5}\right)$

(4) $\frac{28}{5}-\frac{\pi}{2}-\sin^{-1}\left(\frac{3}{5}\right)$

8. 4 marks

Let the slope of the tangent to the curve $y=f(x)$ at any point $P(x, y)$, $x>-1$, be

$$\frac{\sqrt{x^2+9}-3x^2y}{1+x^3}$$

If $f(0)=\frac{9}{2}\log_e 3-10$, then $f(4)$ equals :

(1) $\frac{9\log_e 3+10}{65}$

(2) $\frac{9\log_e 3+20}{65}$

(3) $\frac{9\log_e 3}{65}$

(4) $\frac{9\log_e 3-10}{65}$

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9. 4 marks

Let $\vec{a}$, $\vec{b}$ and $\vec{c}$ be non-coplanar vectors in space. Let the components of a vector $\vec{u}$ along $\vec{a}$, $\vec{b}$ and $\vec{c}$ be 4, -5 and 3 respectively. If the components of $\vec{u}$ along the vectors $-\vec{a}+\vec{b}+2\vec{c}$, $\vec{a}-\vec{b}-\vec{c}$ and $-\vec{a}-\vec{b}+\vec{c}$ are α, β, γ respectively, then the value of $\alpha+2\beta+2\gamma$ is :

(1) 31

(2) 35

(3) 37

(4) 61

---

10. 4 marks

If the mean of the distribution :

Class :	15 - 25	25 - 35	35 - 45	45 - 55	55 - 65	65 - 75	75 - 85
Frequency :	2	4	7	α	8	4	2

is $\frac{201}{4}$, then its variance is equals to :

(1) $\frac{3319}{19}$

(2) $\frac{3519}{29}$

(3) $\frac{3319}{16}$

(4) $\frac{3519}{16}$

---

11. 4 marks

The probability that a randomly chosen one-one function $f: \{1, 2, 3, 4, 5\} \to \{1, 2, 3, 4, 5, 6\}$ satisfies $f(1)+f(2)=f(3)$ is :

(1) $\frac{1}{12}$

(2) $\frac{1}{10}$

(3) $\frac{1}{6}$

(4) $\frac{1}{5}$

---

12. 4 marks

Let 4, A_1, A_2, ..., A_n, 102 and 12, B_1, B_2, ..., B_n, 110 be two arithmetic progressions. If $A_r = B_s$ with $1 \le r - s \le 100$, then the number of possible values of n is :

(1) 20

(2) 25

(3) 50

(4) 75

---

13. 4 marks

The sum of all the coefficients in the expression

$(1+x+x^2+...+x^{49})+(1+x)(1+x+x^2+...+x^{48})+(1+x+x^2)(1+x+x^2+...+x^{47})+...+(1+x+x^2+...+x^{48})(1+x)+(1+x+x^2+...+x^{49})$ is equal to :

(1) 21675

(2) 22525

(3) 22100

(4) 21660

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14. 4 marks

The remainder when $(2023)^{2021}$ is divided by 12 is :

(1) 1 (2) 5

(3) 7 (4) 11

15. 4 marks

The number of positive integers that are ≤ 1000 and divisible by 7 or 13, is :

(1) 218 (2) 208

(3) 228 (4) 192

16. 4 marks

Let A and B be $n \times n$ real matrices such that $A = A^T$ and $B = -B^T$. If $C = A^5B^2 - B^2A^5$ and $D = A^4B^3 - B^3A^4$, then :

(1) C is symmetric and D is skew-symmetric

(2) Both C and D are symmetric

(3) Both C and D are skew-symmetric

(4) C is skew-symmetric and D is symmetric

17. 4 marks

The sum of the real and imaginary parts of all the complex numbers z satisfying

$$\bar{z} = i\left(\text{Re}(z) + z^2\right)$$

is equal to :

(1) 0 (2) 1

(3) -1 (4) $-\frac{\sqrt{3}}{2}$

18. 4 marks

Let a, b, c respectively be the sides of the triangle ABC opposite the angles A, B, C. If $\frac{\sin A}{\sin C} = \frac{\sin(A-B)}{\sin(B-C)}$, then the value of $\frac{1+\cos(A-B)\cos C}{1+\cos(A-C)\cos B} - \frac{a^2}{2b^2}$ is equal to :

(1) $\frac{1}{4}$

(2) $\frac{1}{2}$

(3) 1

(4) 2

---

19. 4 marks

If (a, b, c) is the ortho-centre of the triangle whose sides have the equations $\frac{x-2}{-3} = \frac{y-3}{-2} = \frac{z+2}{4}$, $\frac{x-2}{-1} = \frac{y-3}{-2} = \frac{z+2}{3}$ and $\frac{x}{1} = \frac{y-1}{0} = \frac{z-\frac{3}{2}}{-\frac{1}{2}}$, then $a-2b+2c$ is equal to _____.

(1) 9

(2) 11

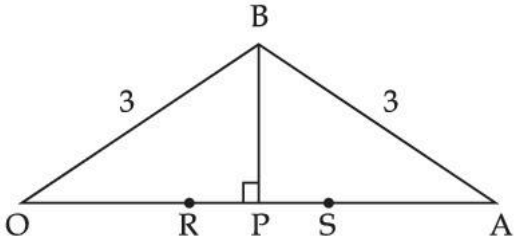
(3) 13

(4) 15

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20. 4 marks

In the below diagram, let $OB = OS = AB = AR = 3$. If the area of the triangle OAB is 1 then the maximum value of $(OP)^2$ is :



(1) $\frac{9+\sqrt{77}}{2}$

(2) $\frac{9-\sqrt{77}}{2}$

(3) $\frac{3+\sqrt{77}}{2}$

(4) $\frac{12-\sqrt{77}}{2}$

---

21. Numerical value · 4 marks

The least value of $\alpha \in \mathbf{R}$ for which

$$\lim_{x\to 0} \frac{(2^x - 1)^2 \tan^\alpha x}{(\sin^{-1}x)\log_e(1+x^6)}$$

exists and is finite, is equal to _____.

---

22. Numerical value · 4 marks

Let $\vec{a} = 2\hat{i} - \hat{j} + \hat{k}$ and $\vec{b} = \hat{i} + \hat{j} - \hat{k}$. Let a vector $\vec{c}$ be coplanar with the vectors $\vec{a}$ and $\vec{b}$. If $|\vec{c}|^2 = 66$ and $\vec{c} \cdot (\vec{a} + \vec{b}) = 12$, then the value of $|\vec{b} \cdot \vec{c} - 4|$ is equal to _____.

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23. Numerical value · 4 marks

Let P_1 and P_2 be the images of the point P(−1, 1, 1) in the planes $-2x+y+z+1=0$ and $x-y-z+2=0$ respectively. If the length of the line segment joining P_1 and P_2 is α, then the value of $9\alpha^2$ is equal to _____.

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24. Numerical value · 4 marks

If the line segment joining the points A(a, 2) and B(2, 3) subtends an angle $\frac{\pi}{4}$ at the origin, then the maximum absolute value of a is equal to _____.

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25. Numerical value · 4 marks

Let the slope of the tangent at (x, y) to a curve passing through the point (2, 4) be $\frac{(x+y)^2}{(x+1)(y-1)}$.

If the equation of the curve is

$(x+1)^\alpha (x+2y-\beta) = \alpha^5 e^{\left(\frac{2y-\gamma x-4}{x+1}\right)}$, then the value of $\alpha+\beta+\gamma$ is equal to _____.

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26. Numerical value · 4 marks

Let $f(t) = \int_{-t}^{t} e^{x^2}\left((1+2x^2)\sin x + x\cos x\right)dx$. Then the value of $f\left(\frac{\pi}{2}\right) + f(\pi)$ is equal to _____.

27. Numerical value · 4 marks

All possible 6-digit odd numbers formed with the digits 1, 1, 2, 3, 7, 8 are written in descending order. If 378121 is the K^{th} term of the sequence so formed, then K is equal to _____.

28. Numerical value · 4 marks

Let $A=[a_{ij}]$ be 3×3 real matrix and $Adj(A)=[A_{ij}]$. If $a_{1j}+a_{2j}+a_{3j}=1$, for $j=1, 2, 3$ and $A_{11}=2$, $A_{31}=4$ and $\det(A)=10$, then A_{21} equals _____.

29. Numerical value · 4 marks

The least value of a real number K for which the equation $4x^2-8(K-1)x+3K^2+10-9K=0$ has atleast one positive root is _____.

30. Numerical value · 4 marks

The number of transitive relations from the set $\{x, y\}$ to $\{x, y\}$ is equal to _____.

31. 4 marks

A plan for selecting colours for composition is also known as _____.

(1) Colour spectrum
(2) Colour wheel
(3) Colour scheme
(4) Colour mix

32. 4 marks

'Rowlatt Act' passed in which year ?

(A) 1919
(B) 1920
(C) 1918
(D) 1921

Choose the **most appropriate** answer from the options given below :

(1) (A) only
(2) (A) and (B) only
(3) (B) only
(4) (B) and (C) only

33. 4 marks

The marble inlay work with precious and semi-precious stone in 'Taj Mahal' or elsewhere is popularly known as :

(1) Mondrian inlay work
(2) Kalamkari
(3) Pietra Dura/Parchinkari
(4) Zardosi

34. 4 marks

'Shaking Minaret' situated in the city of _____.

(1) Hyderabad
(2) Lucknow
(3) Ahmedabad
(4) Aurangabad

35. 4 marks

Which of the following personalities is **not** an Architect ?

(1) Renzo Piano
(2) Richard Gere
(3) Charles Correa
(4) Richard Rogers

36. 4 marks

In which state 'Bihu' is most widely celebrated ?

(1) Rajasthan
(2) Uttar Pradesh
(3) Nagaland
(4) Assam

37. 4 marks

'NRCP' stands for _____.

(1) National River Concept Plan
(2) National River Conserve Plan
(3) National River & Conservation Plan
(4) National River Conservation Plan

38. 4 marks

Vernacular Architecture mainly involves :

(1) Use of modern/contemporary materials
(2) Use of automation technology
(3) Use of composite & hightech materials
(4) Use of locally available material & traditional construction technology

39. 4 marks

A discomfort caused by light contrast is known as _____.

(1) Heat
(2) Glare
(3) Skin allergy
(4) Reflection of light

collegedunia

40. 4 marks

'Red Fort' of Agra was commissioned by whom ?

(1) Akbar
(2) Bahadur Shah Zafar
(3) Shahjahan
(4) Babar

41. 4 marks

The unit of measuring sound absorption in a room is :

(1) Sabin
(2) Phon
(3) Hertz
(4) Decibel

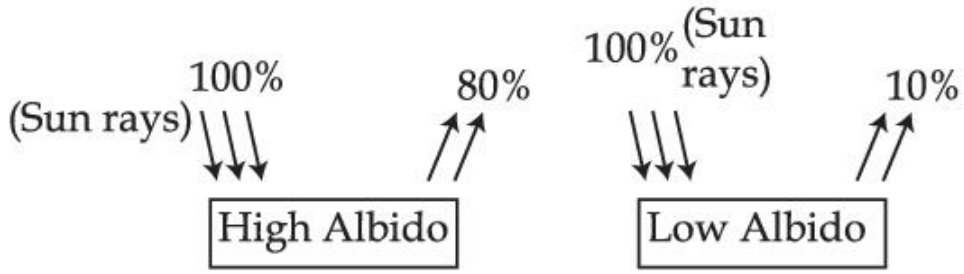
42. 4 marks

A land size of 60 meter × 30 meter for a house design is drawn on paper at scale of 1 : 100, then what size is drawn on paper to represent land ?

(1) 6 meter × 3 meter
(2) 60 cm × 30 cm
(3) 6 cm × 3 cm
(4) 3 m × 1.5 m

43. 4 marks

Albido refers to :



(1) Thermal properties of external surface material
(2) Sound absorption properties of material
(3) Roughness of surface
(4) Porous properties of surface/material

44. 4 marks

Match **List - I** with **List - II**.

	List - I		List - II
(A)	Solid lines	(I)	Relatively long line segments separated by zigzag strokes
(B)	Dashed lines	(II)	Delineate form of objects, edge of plane & intersection of planes
(C)	Grid lines	(III)	Indicate hidden segments
(D)	Break lines	(IV)	Rectangular or radial system of lines for regulating plan

Choose the **correct** answer from the options given below :

(1) (A) - (IV), (B) - (I), (C) - (II), (D) - (III)

(2) (A) - (II), (B) - (I), (C) - (IV), (D) - (III)

(3) (A) - (II), (B) - (III), (C) - (IV), (D) - (I)

(4) (A) - (II), (B) - (I), (C) - (III), (D) - (IV)

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45. 4 marks

Given below are two statements :

Statement I : Modular Proportioning system was developed by German Architect Mics Van der Rohe.

Statement II : It combines the aesthetic dimensions of Golden ratio & Fibonacci series.

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

(1) Both **Statement I** and **Statement II** are correct

(2) Both **Statement I** and **Statement II** are incorrect

(3) **Statement I** is correct but **Statement II** is incorrect

(4) **Statement I** is incorrect but **Statement II** is correct

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46. 4 marks

'My Architect' 'A son's journey' documentary is on which of the following Architect ?

(1) Louis Kahn

(2) Moshe Shafdi

(3) Zaha Hadid

(4) I.M. Pei

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47. 4 marks

Which one of the following is **not** related to prestigious international awards in Architecture ?

(1) Royal Gold Medal (RIBA)

(2) Pritzker Prize

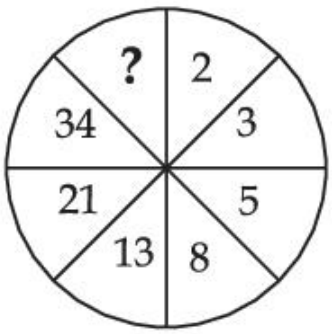
(3) Aga Khan Award

(4) META Award

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48. 4 marks

Identify the missing number in the given image :



(1) 83

(2) 48

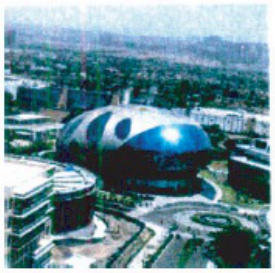
(3) 55

(4) 84

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49. 4 marks

Match **List - I** with **List - II**.

List - I		List - II
(A)		(I) The Shard, London by Renzo Piano
(B)		(II) Infosys Building, Pune by Hafeez Contractor
(C)		(III) Jubilee Church, Rome by Richard Mier
(D)		(IV) LIC Building, New Delhi by Charles Correa

Choose the **correct** answer from the options given below :

(1) (A) - (I), (B) - (III), (C) - (IV), (D) - (II)

(2) (A) - (IV), (B) - (II), (C) - (I), (D) - (III)

(3) (A) - (III), (B) - (I), (C) - (II), (D) - (IV)

(4) (A) - (III), (B) - (II), (C) - (I), (D) - (IV)

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50. 4 marks

'Green is Red' book is written by which of the following Architect ?

(1) Revathi Kamath

(2) Anupama Kundu

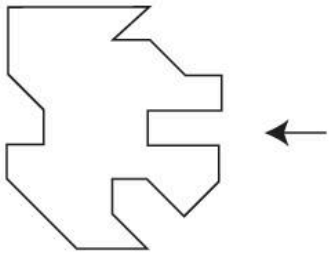
(3) Anil Laul

(4) P.K. Das

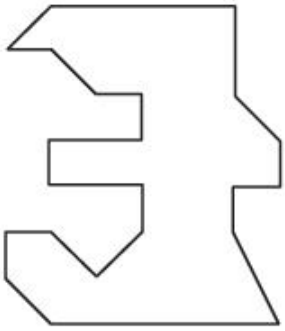
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51. 4 marks

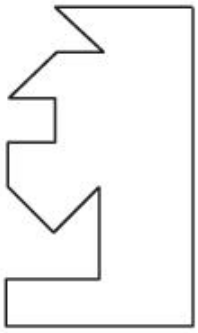
Given figure shows plan of an object. Identify the correct option from answer figure which will perfectly fit on right hand side of the question figure ?



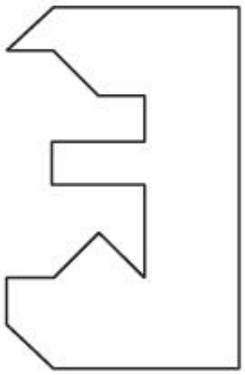
(1)



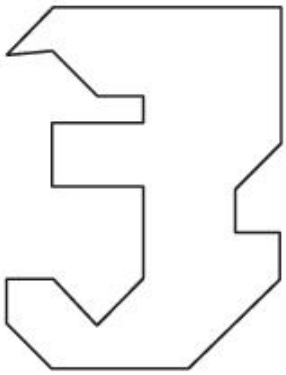
(2)



(3)

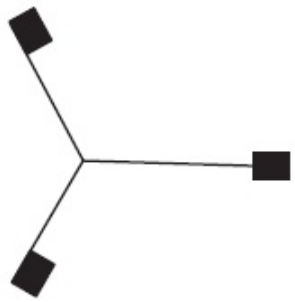


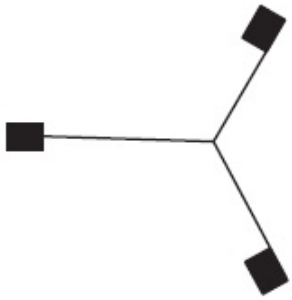
(4)



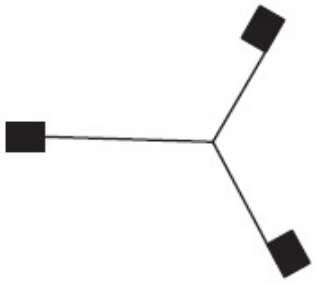
52. 4 marks

Find the odd figure in the problem figure given below.

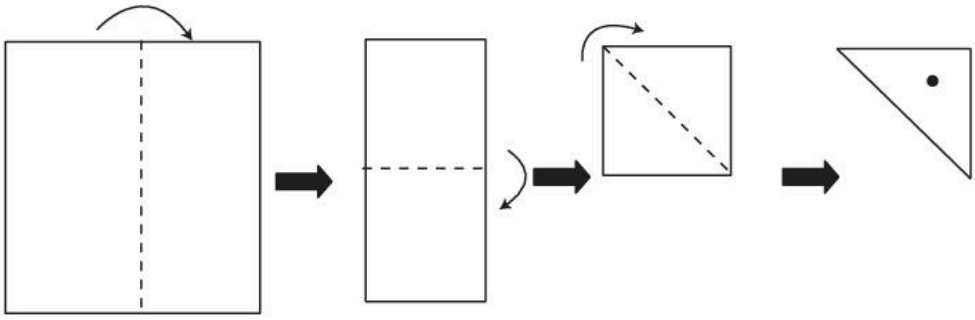
(1) 

(2) 

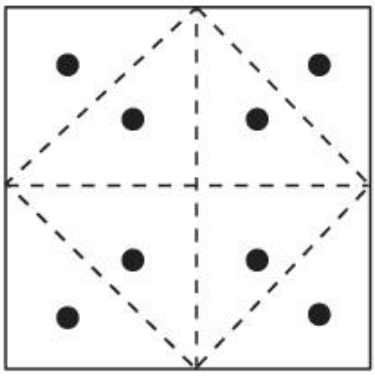
(3) 

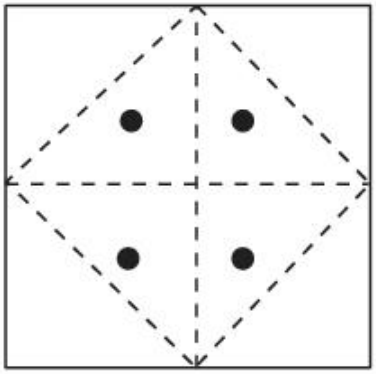
(4) 

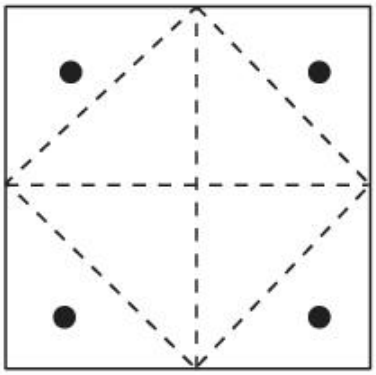
53. 4 marks

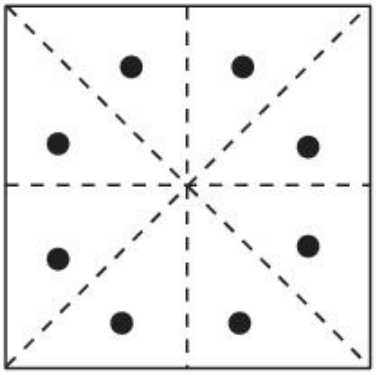


A square paper is folded as shown in the figure (above). A circular hole is created in the triangular portion. Now paper is unfolded. What will be the right diagram ?

(1) 

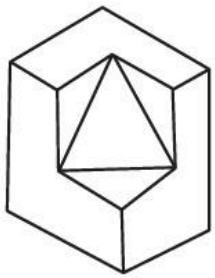
(2) 

(3) 

(4) 

54. 4 marks

Question figure shows 3 D view of an object. Identify number of surfaces in given object.



(1) 11

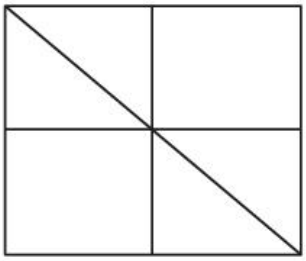
(2) 10

(3) 9

(4) 13

55. 4 marks

How many total number of triangles are hidden in the problem figure given below ?



(1) 16

(2) 12

(3) 06

(4) 08

56. 4 marks

In a code language if 'PLEASE' is written as '573183' then 'LAPSE' will be written as _____.

(1) 71853

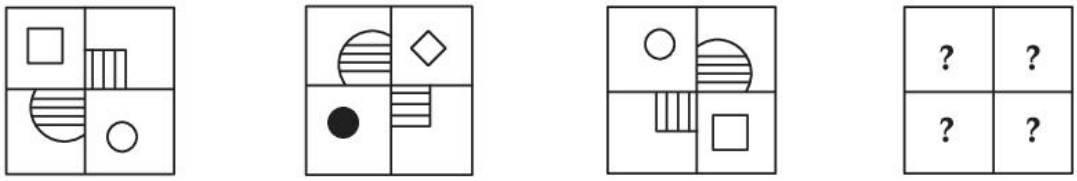
(2) 81573

(3) 71583

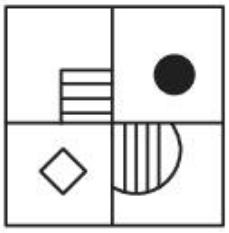
(4) 715831

57. 4 marks

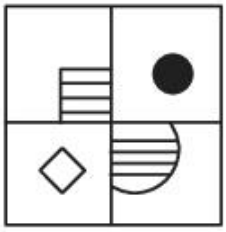
Which one of the answer figures will complete the sequence of the three problem figures ?



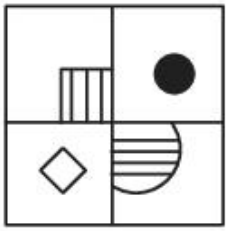
(1)



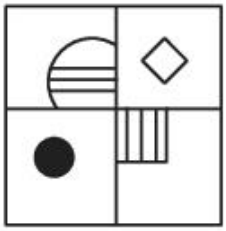
(2)



(3)

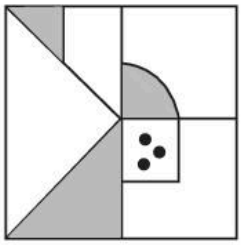


(4)

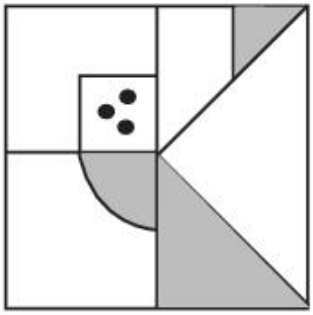


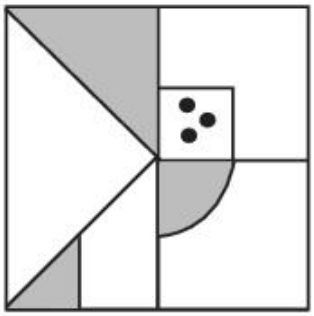
58. 4 marks

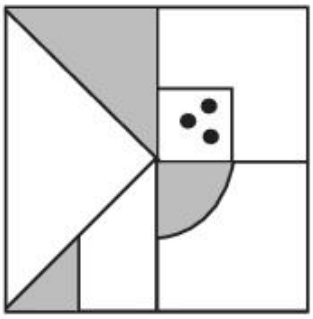
Choose one out of four figures which shows the correct water image of the problem figure (X).

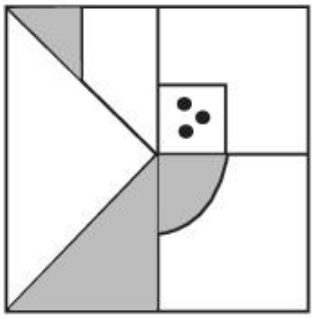


(X)

(1) 

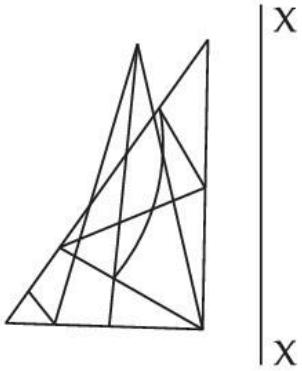
(2) 

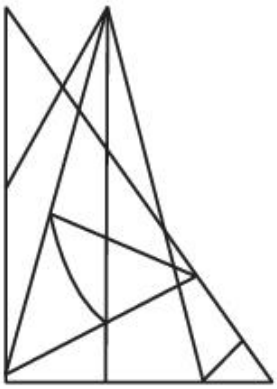
(3) 

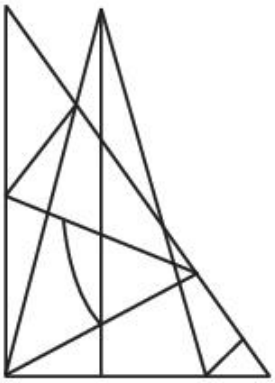
(4) 

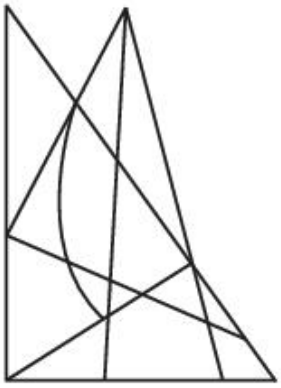
59. 4 marks

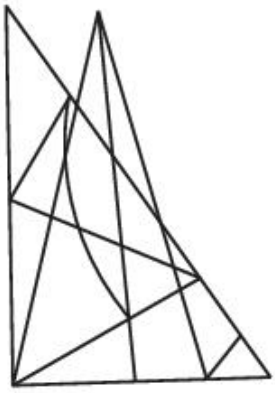
Which one of the answer figure is the correct mirror image of the problem figure with respect to X - X ?



(1) 

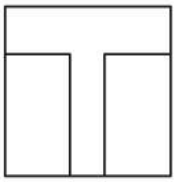
(2) 

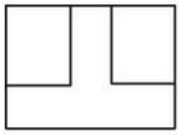
(3) 

(4) 

60. 4 marks

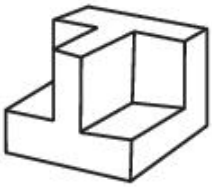
Question figure shows top view/plan, front elevation and right side elevation of the same object. Identify the most appropriate 3 D view of the problem figures from given answer figure.



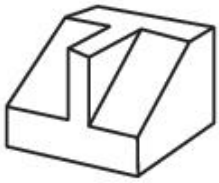




(1)



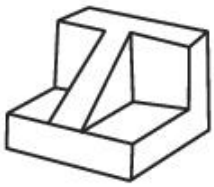
(2)



(3)

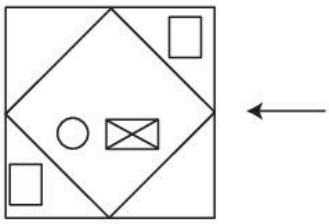


(4)

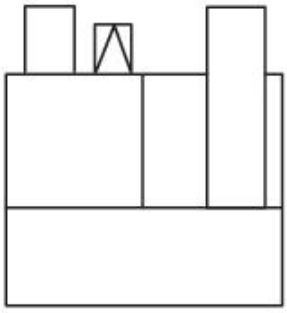


61. 4 marks

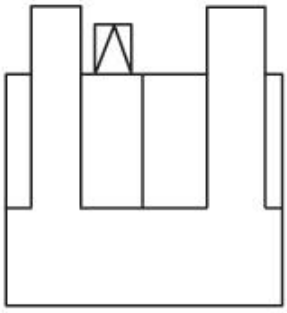
Question figure shows top view/plan of an object. Looking in the direction of arrow, identify the correct elevation from given answer figures.



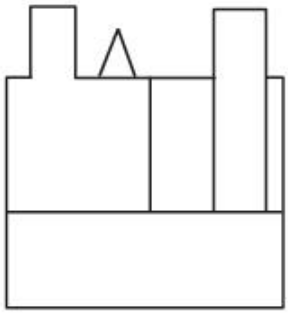
(1)



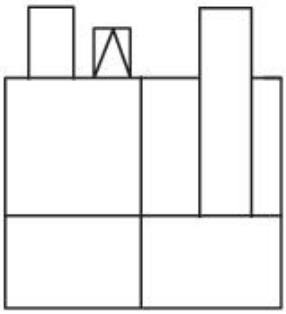
(2)



(3)

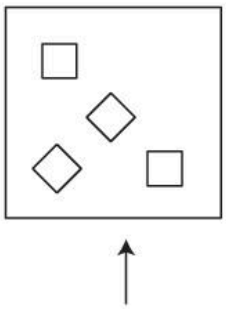


(4)

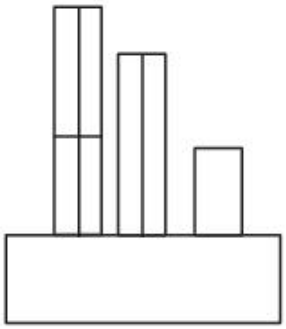


62. 4 marks

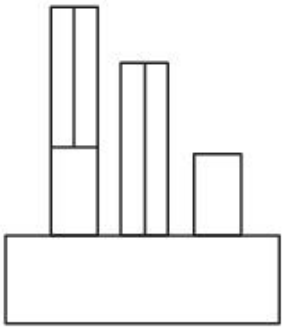
The problem figure shows top view/plan of an object. Looking in the direction of arrow identify the correct elevation from given answer figures.



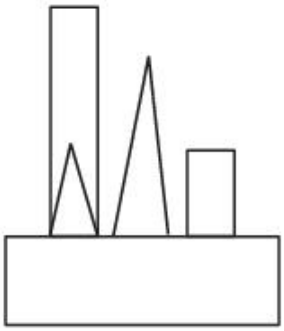
(1)



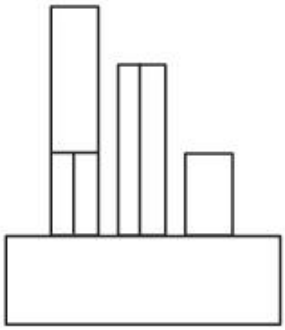
(2)



(3)

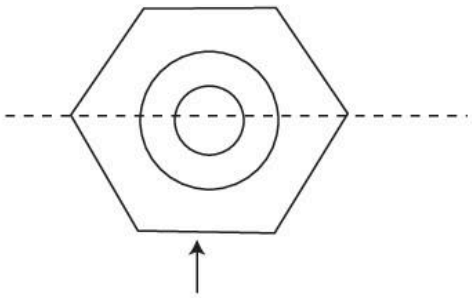


(4)

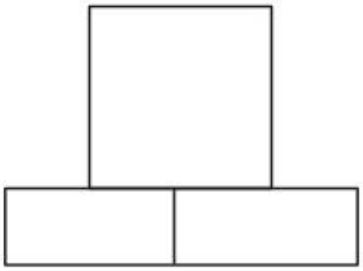


63. 4 marks

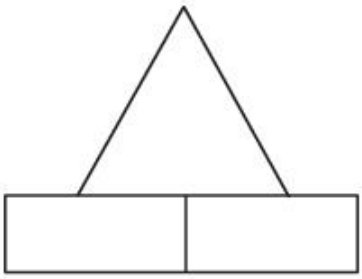
Question figure shows top view/plan of an object. Looking in the direction of arrow. Identify the correct elevation from given answer figure.



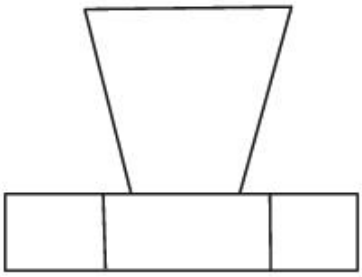
(1)



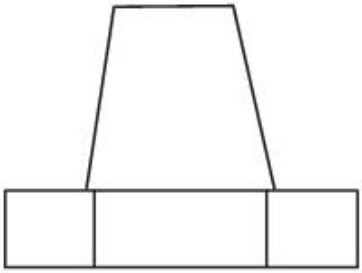
(2)



(3)

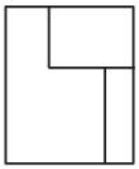


(4)



64. 4 marks

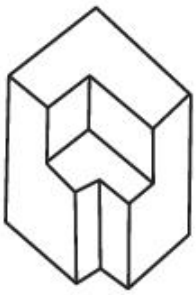
Question figure shows elevation of an object. Identify most appropriate 3 D view of the problem figure from given answer figures.



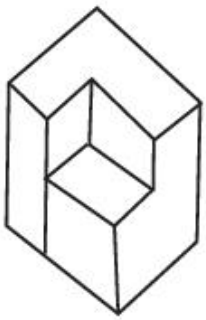
(1)



(2)



(3)

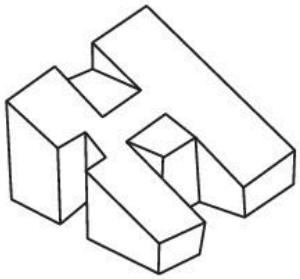


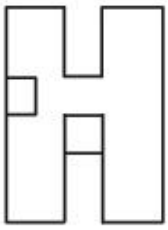
(4)

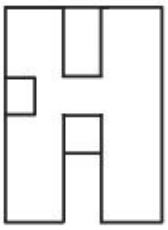


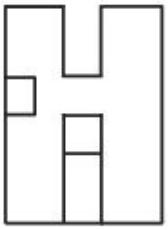
65. 4 marks

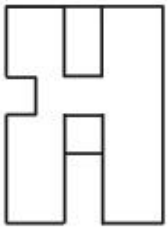
Question figure shows 3 D view of an object. Identify the most appropriate top view/ plan of given 3 D figure from answer figure.



(1) 

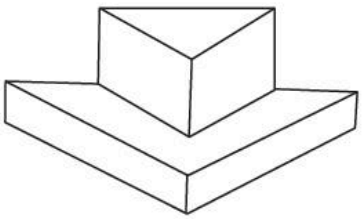
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(3) 

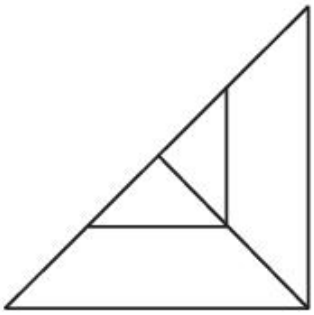
(4) 

66. 4 marks

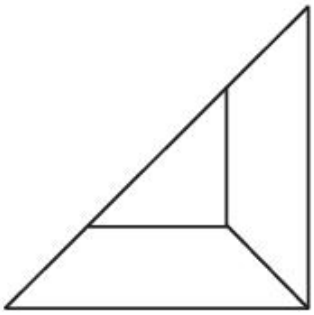
Question figure shows 3 D view of an object. Identify most appropriate top view/plan of the object from given answer figures.



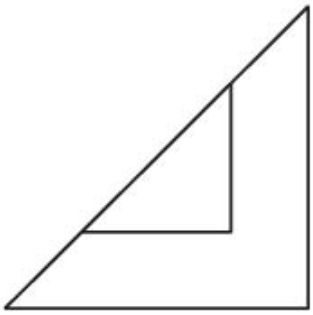
(1)



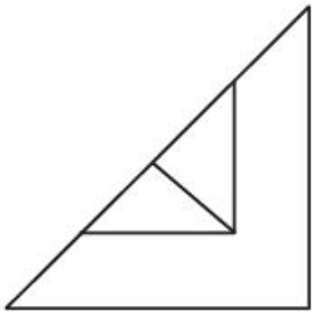
(2)



(3)

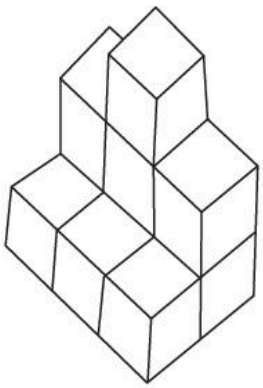


(4)

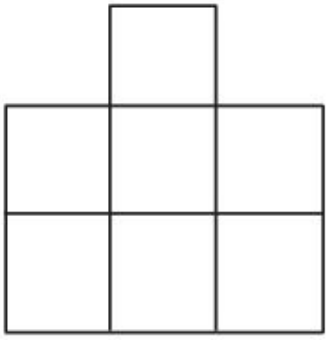


67. 4 marks

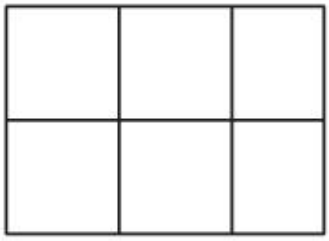
Question figure shows 3 D view of an object. Identify most appropriate top view/plan of the given object from given answer figures.



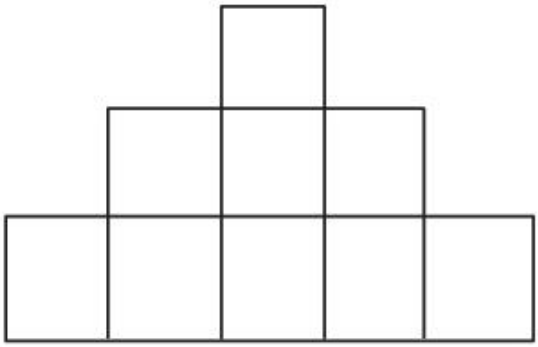
(1)



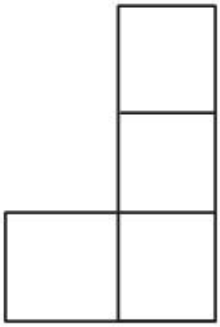
(2)



(3)

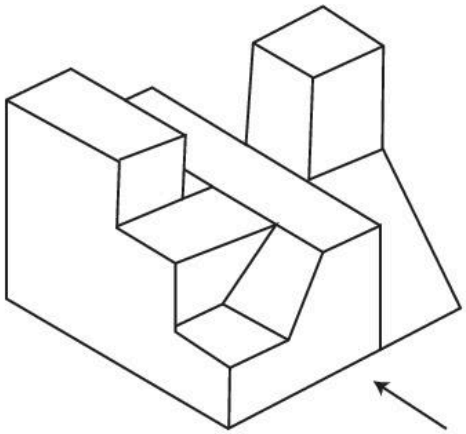


(4)

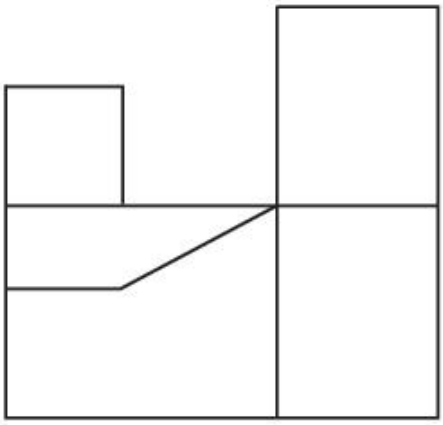


68. 4 marks

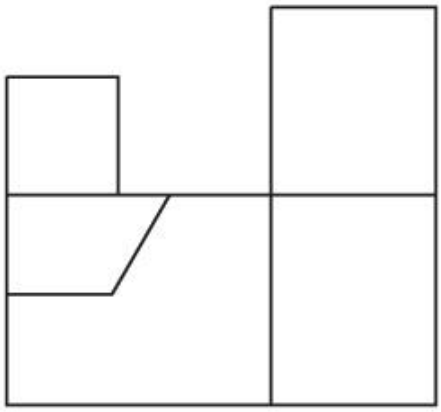
The question figure shows 3 D view of an object. Identify the most appropriate elevation of the given 3 D object, looking in the direction of an arrow, from the given answer figures.



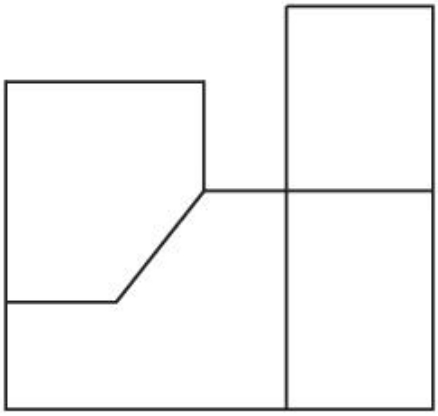
(1)



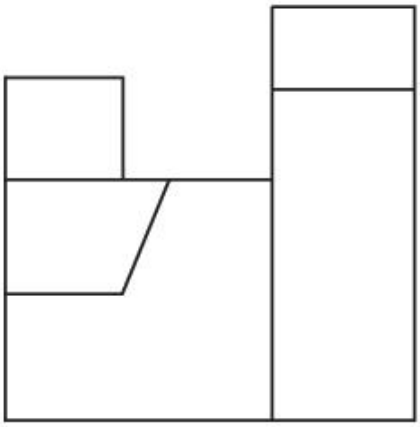
(2)



(3)

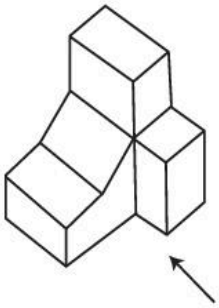


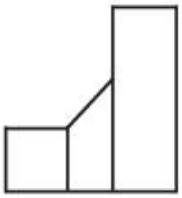
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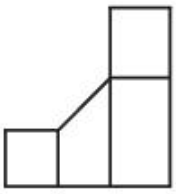


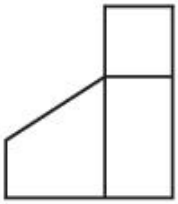
69. 4 marks

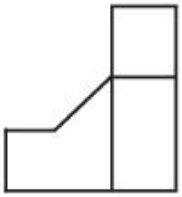
Question figure shows 3 D view of an object. Identify the most appropriate elevation of the given 3 D object, looking in the direction of an arrow from the given answer figures.



(1) 

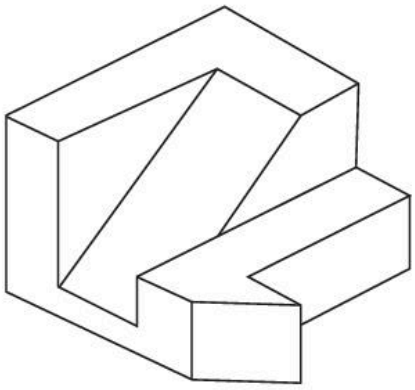
(2) 

(3) 

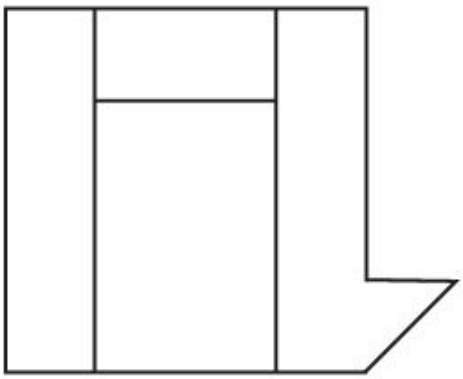
(4) 

70. 4 marks

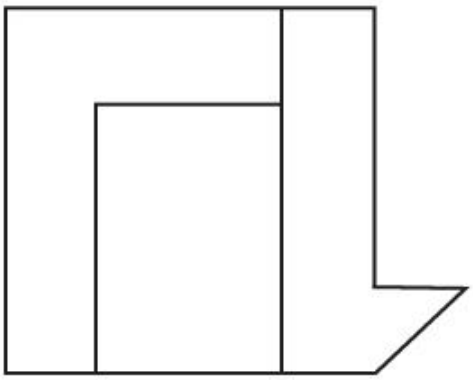
The question figure shows 3 D view of an object. Identify the most appropriate top view/ plan of given 3 D object from given answer figures.



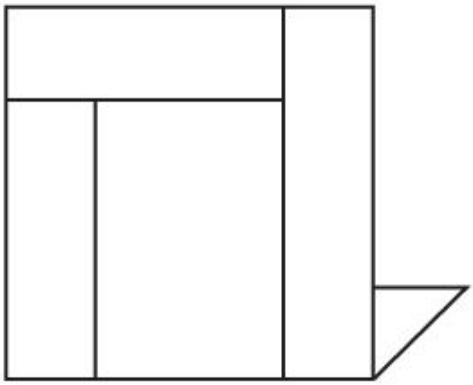
(1)



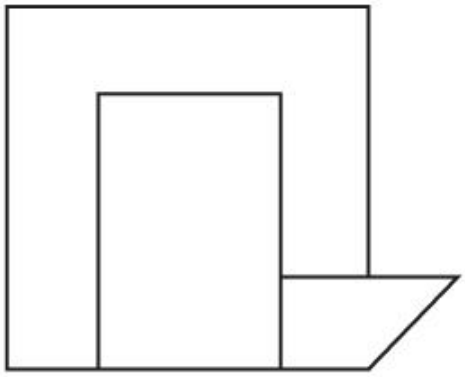
(2)



(3)

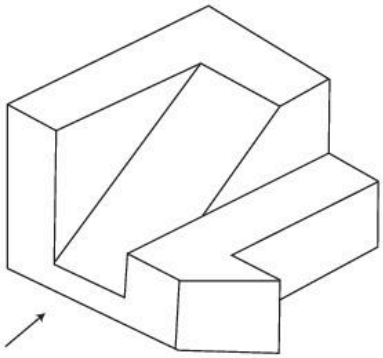


(4)

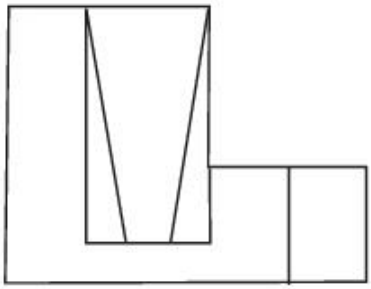


71. 4 marks

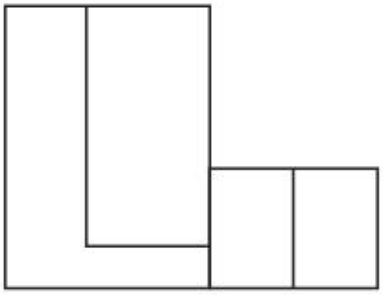
Question figure shows 3 D view of an object. Identify the most appropriate elevation of the given 3 D object. Looking in the direction of an arrow, from the given answer figures.



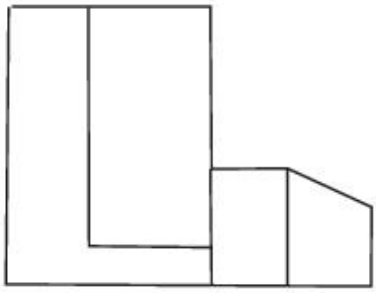
(1)



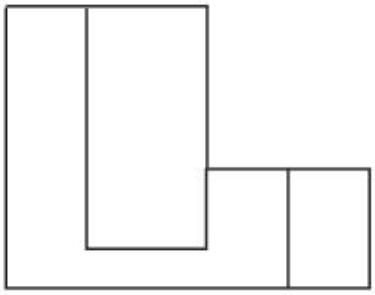
(2)



(3)

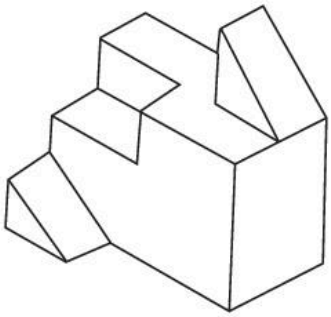


(4)

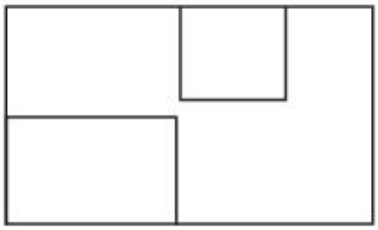


72. 4 marks

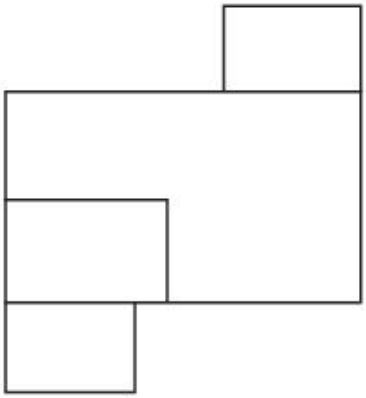
Question figure shows 3 D view of an object. Identify most appropriate top view/plan of the object from given answer figures.



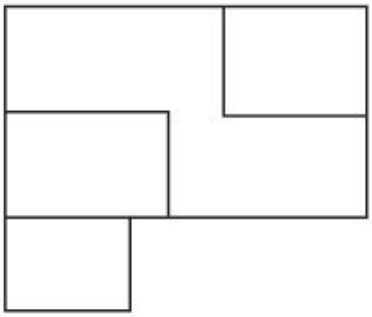
(1)



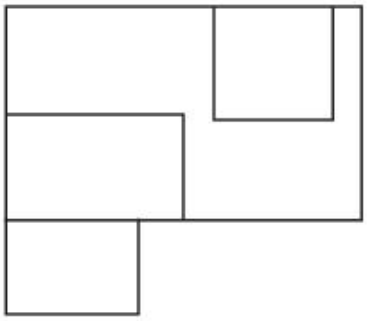
(2)



(3)

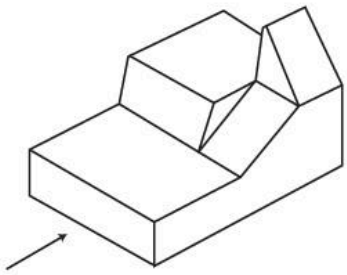


(4)

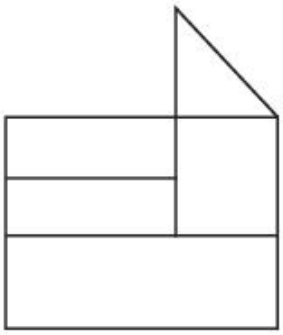


73. 4 marks

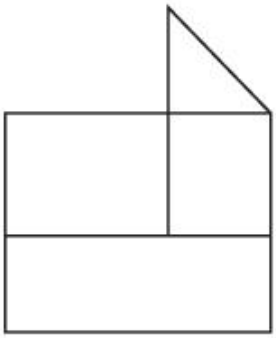
Question figure shows 3 D view of an object. Identify the most appropriate elevation of the given 3 D object, looking in the direction of an arrow, from the given answer figures.



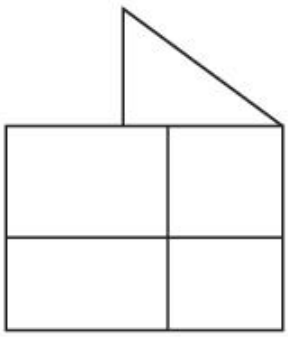
(1)



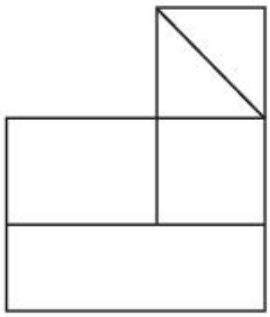
(2)



(3)

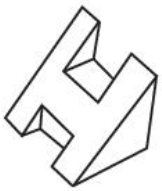


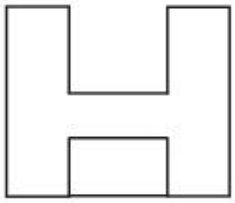
(4)

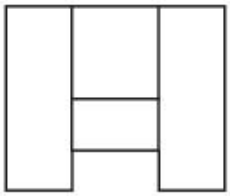


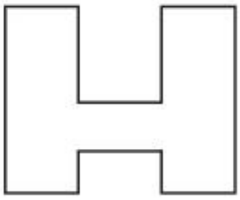
74. 4 marks

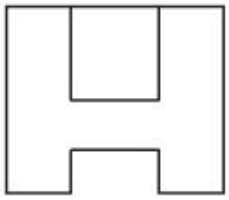
Question figure shows 3 D view of an object. Identify the most appropriate top view/ plan of the object from the given answer figures.



(1) 

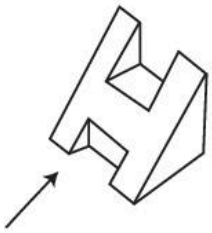
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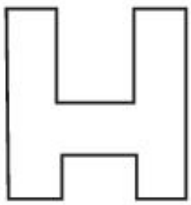
(3) 

(4) 

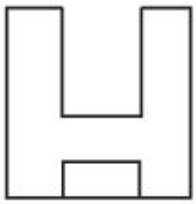
75. 4 marks

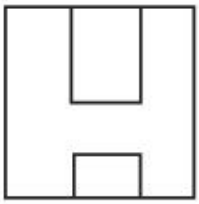
Question figure shows 3 D view of an object. Identify the most appropriate elevation of the given 3 D object, looking in the direction of an arrow from the given answer figures.



(1) 

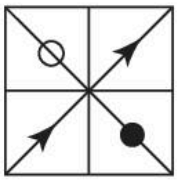
(2) 

(3) 

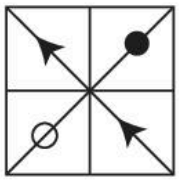
(4) 

76. 4 marks

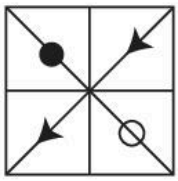
In the problem figure, 'A' & 'B' have certain relation. Identify which one of the answer figures will have similar relation between 'C' & 'D' ?



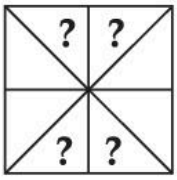
(A)



(B)

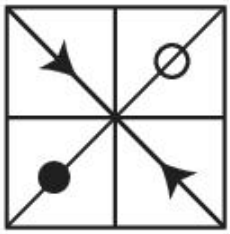


(C)

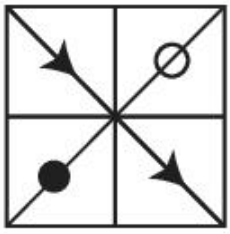


(D)

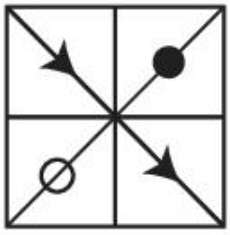
(1)



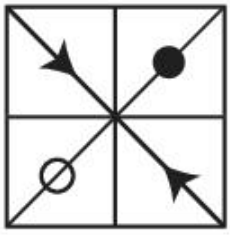
(2)



(3)

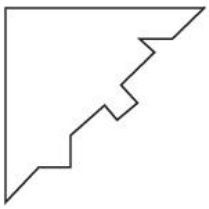


(4)

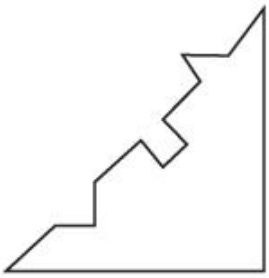


77. 4 marks

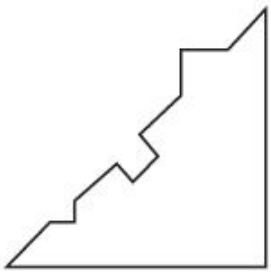
Which of the following answer figures will interlock diagonally into the question figure ?



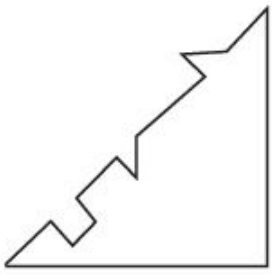
(1)



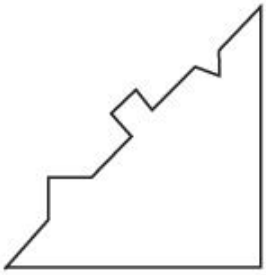
(2)



(3)

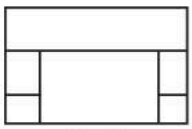


(4)

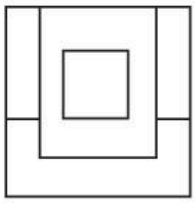


78. 4 marks

Question figure shows top view/plan, front elevation & right side elevation of the same object. Identify most appropriate 3 D view of the object from given answer figures.



TOP

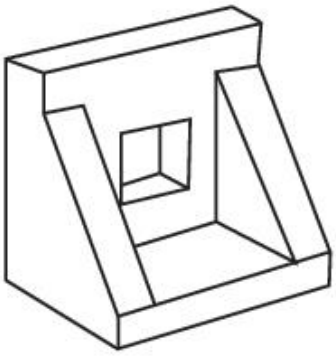


FRONT

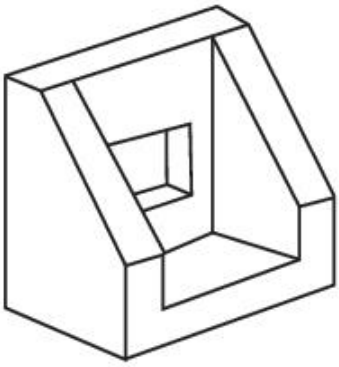


RIGHT SIDE

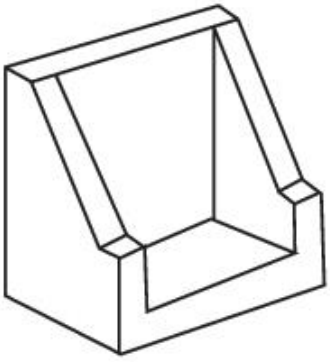
(1)



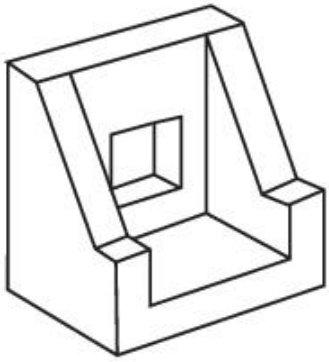
(2)



(3)

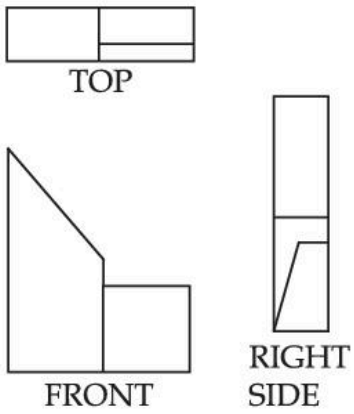


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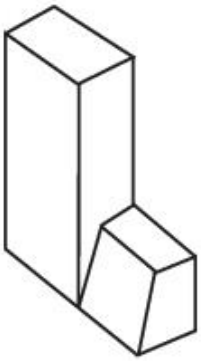


79. 4 marks

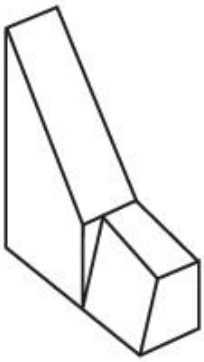
Question figure shows top view/plan, front elevation & right side elevation of the same object. Identify most appropriate 3 D view of the object from given answer figures.



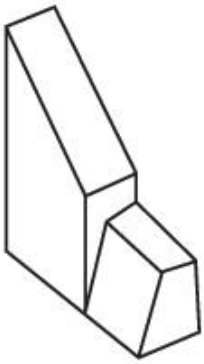
(1)



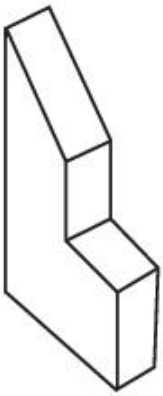
(2)



(3)

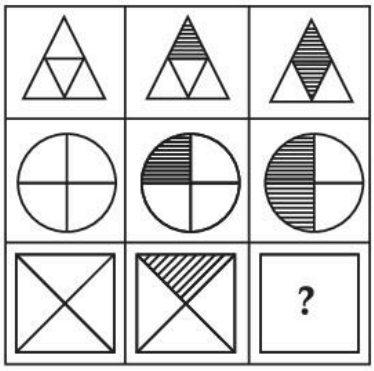


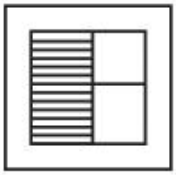
(4)



80. 4 marks

Find out which of the answer figure completes the figure matrix sequence from given answer figures.



(1) 

(2) 

(3) 

(4) 

Planning

81. 4 marks

Name of first town planning legislation enacted in India.

(1) Bombay Town Planning Act

(2) Madras Town Planning Act

(3) Orissa Town Planning and Improvement Act

(4) Kanpur Urban Area (development) Act

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82. 4 marks

Match the following :

(A)	Eri	(I)	Ladakh
(B)	Ahar Pynes	(II)	Nagaland
(C)	Johads	(III)	Bihar
(D)	Zings	(IV)	Rajasthan
(E)	Zabo	(V)	Tamilnadu
(F)	Bawaris	(VI)	Odisha

(1) (A) - (IV), (B) - (II), (C) - (I), (D) - (VI), (E) - (III), (F) - (V)

(2) (A) - (V), (B) - (III), (C) - (VI), (D) - (I), (E) - (II), (F) - (IV)

(3) (A) - (III), (B) - (I), (C) - (VI), (D) - (II), (E) - (IV), (F) - (V)

(4) (A) - (V), (B) - (IV), (C) - (II), (D) - (VI), (E) - (I), (F) - (III)

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83. 4 marks

Arrange the development of following type of modern industries in India with its Chronological order.

(A) Textile mill

(B) Jute mill

(C) Iron and steel factory

(1) (B) → (A) → (C)

(2) (C) → (A) → (B)

(3) (A) → (B) → (C)

(4) (B) → (C) → (A)

84. 4 marks

The distance of points 'A' and 'B' on actual ground is 250 m. What will be the measurement between the points 'A' and 'B' on map drawn on scale 1:1000 ?

(1) 25 cm

(2) 2.5 cm

(3) 25 m

(4) 25 mm

85. 4 marks

How many sustainable dimensions were adopted by United Nations ?

(1) 4

(2) 5

(3) 3

(4) 6

86. 4 marks

What is the full form of 'URDPFI', guidelines ? By Ministry of Housing and Urban Affairs, India :

(1) Urban and Rural Development Plans Formulation and Implementation.

(2) Urban and Rural Design Plans Formulation and Implementation.

(3) Urban and Regional Design Plans Formulation and Implementation.

(4) Urban and Regional Development Plans Formulation and Implementation.

87. 4 marks

Name of famous Peruvian Historic sanctuary enlisted in 'UNESCO' WORLD HERITAGE site.

(1) Machu Picchu

(2) Lima

(3) Tacna

(4) Cusco

88. 4 marks

Which of the following does not enter in GDP ?

(1) National Defense
(2) Life expectancy
(3) Public service
(4) Public education

89. 4 marks

Identify the most appropriate set that relates to physical Infrastructure.

(1) Housing, education, health.
(2) Water supply, solid waste management, electricity.
(3) Petrol pumps, milk booths, LPG.
(4) Communication, parks, fire station.

90. 4 marks

Which one of the following is not correct pair ?

	List - I		**List - II**
(A)	Mediterranean Region	(I)	Pleasant Climate
(B)	Ganga Plains	(II)	Minerals
(C)	Osaka	(III)	Industrial Region
(D)	Katanga Zambia	(IV)	Copper mines

(1) (A) - (I)
(2) (B) - (II)
(3) (C) - (III)
(4) (D) - (IV)

91. 4 marks

Primary sector of economic activity is associated with :

(1) Real estate
(2) Agriculture
(3) Construction
(4) Education

92. 4 marks

The term 'Necropolis' refers to :

(1) Small size of city

(2) The New Metropolis

(3) The dead City

(4) The City in space

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93. 4 marks

A Cul - de - sac is a street where :

(1) Only two wheelers are permitted

(2) Thorough traffic is discouraged

(3) Pedestraians are not permitted

(4) Vehicles are permitted to move in one direction only

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94. 4 marks

Which year Human Development Report was published for the first time in India ?

(1) 1981

(2) 1990

(3) 1870

(4) 1980

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95. 4 marks

A City with 2 million population has the notified Urban area of 250 sq.km. One-fourth of the total population of the city resides in slums within four percent of notified Urban area.

Find the correct answer.

(1) The density of population in slum is 5,000 persons per Sq.km.

(2) The density of population in slums is 50,000 persons per Sq.km.

(3) The density of population in slums is 10,000 persons per Sq.km.

(4) The density of population in slum is 1,000 persons per Sq.km.

---

96. 4 marks

Town is classified as 'Mono functional' when :

(1) $\geqslant 60\%$ workers are in single sector

(2) $\geqslant 40\%$ workers are in single sector

(3) $\geqslant 30\%$ workers are in single sector

(4) $\geqslant 50\%$ workers are in single sector

---

97. 4 marks

Identify the incorrect pair for Biomedical Waste Management in Hospitals.

	List - I		**List - II**
(A)	Red	(I)	Outdated and discarded medicines
(B)	Blue	(II)	Glass bottles and articles
(C)	Yellow	(III)	Infections waste, bandages
(D)	Black	(IV)	Needles without syringes, blads shapes

(1) A - I

(2) B - II

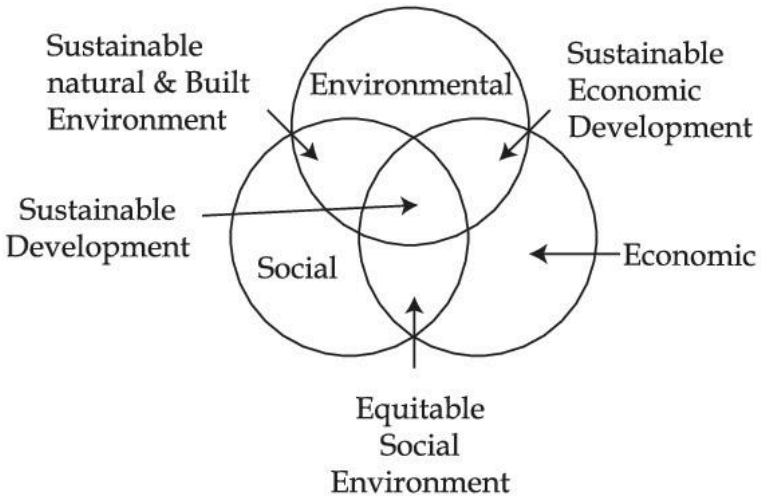
(3) C - III

(4) D - IV

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98. 4 marks

Which aspect is in the social dimension but not in environmental dimension from given Venn diagram.



(1) Sustainable economic development

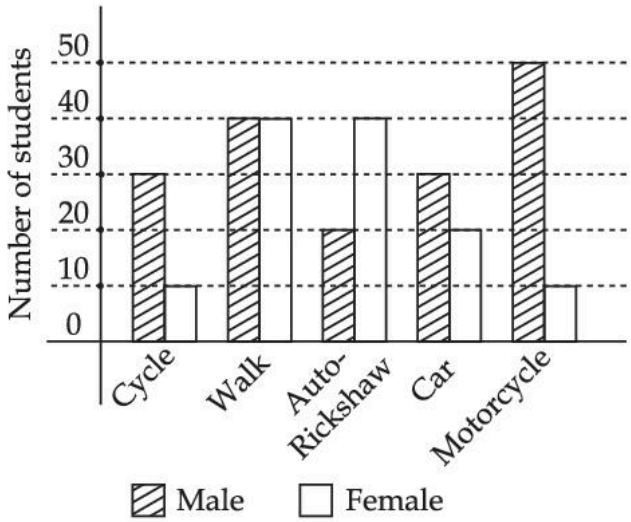
(2) Sustainable development

(3) Equitable social environment

(4) Sustainable Natural and built environment

99. 4 marks

The diagram shows the number of male and female students using different modes of transport to commute to their school which of the following statements is/are correct ?



(A) 50% of all those who use cycles to their school are females

(B) More males compared to females use auto-rikshaws for commuting to school.

(C) More females compared to males use cycles for commuting to school.

(D) The highest share of students prefer walk for commuting to school.

(1) Both (D) and (A)

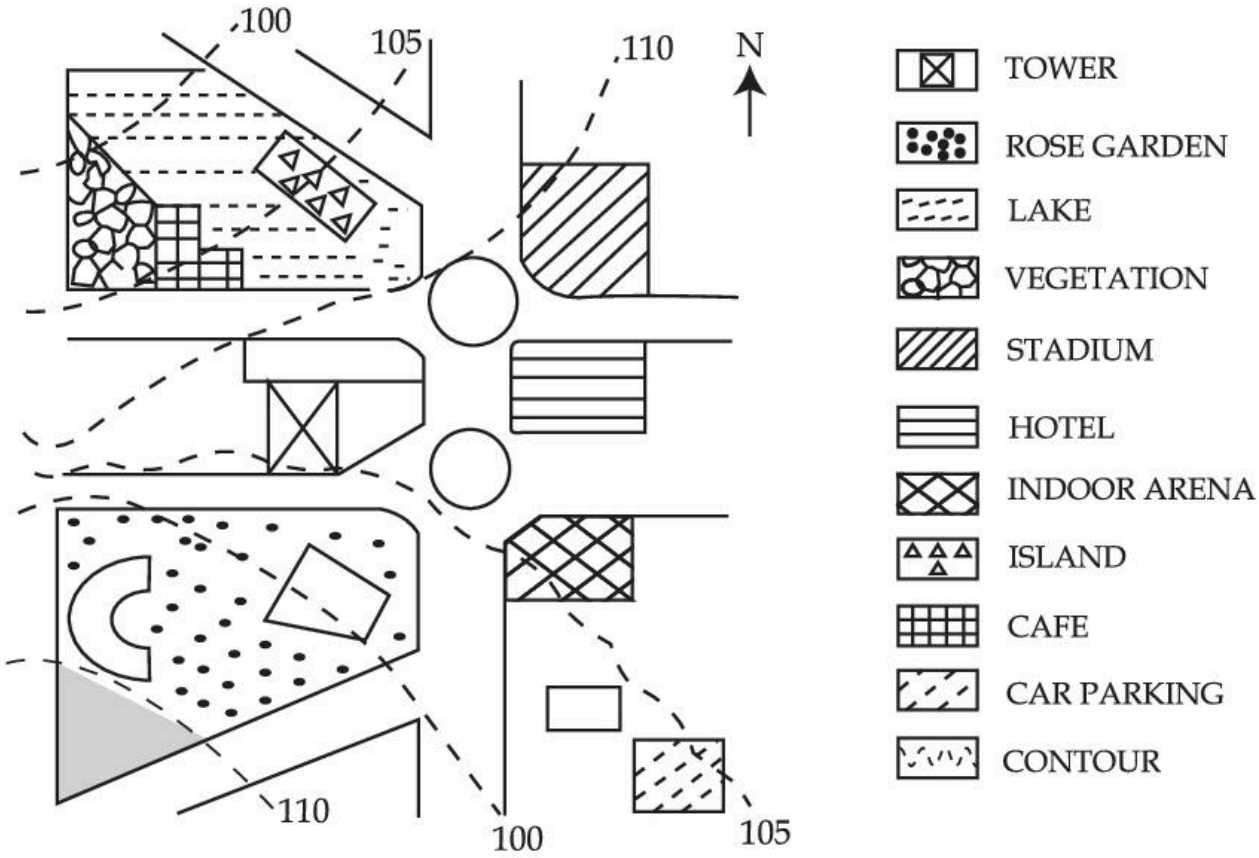
(2) Only (D)

(3) Both (B) and (C)

(4) Only (A)

100. 4 marks

In the given map, the island is located at a level.



(1) 5 m higher than indoor arena

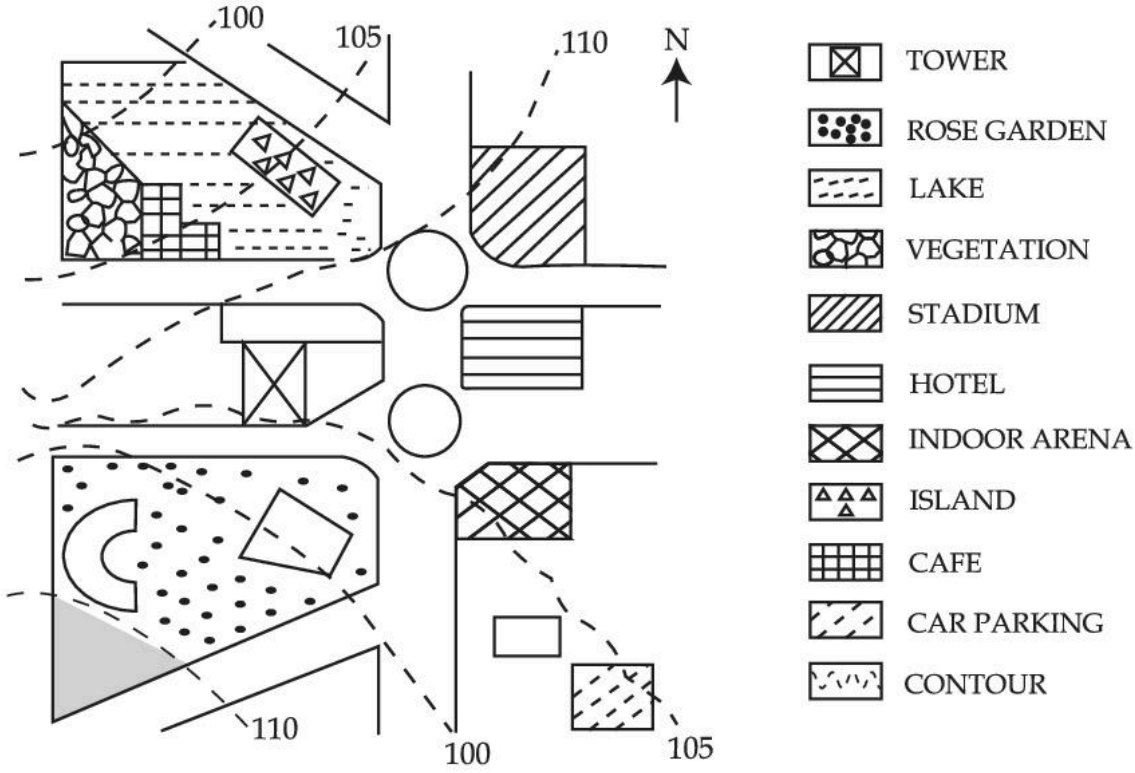
(2) 5 m higher than car parking

(3) Same level as that of indoor arena

(4) 5 m lower than cafe

101. 4 marks

In the given diagram, for a person to travel from cafe to the Rose garden, one will have to move in _____ direction.



(1) East

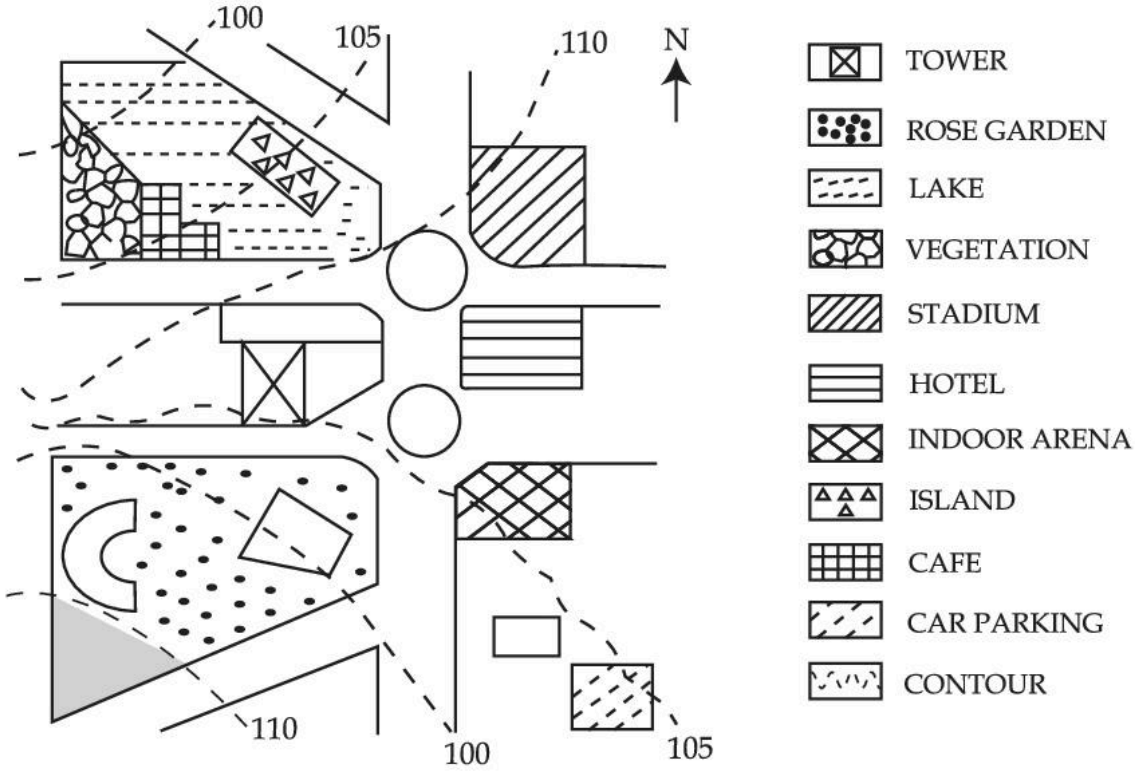
(2) North east

(3) West

(4) South west

102. 4 marks

In the given diagram for a person to travel from island to car parking one has to move in _____ direction.



(1) East

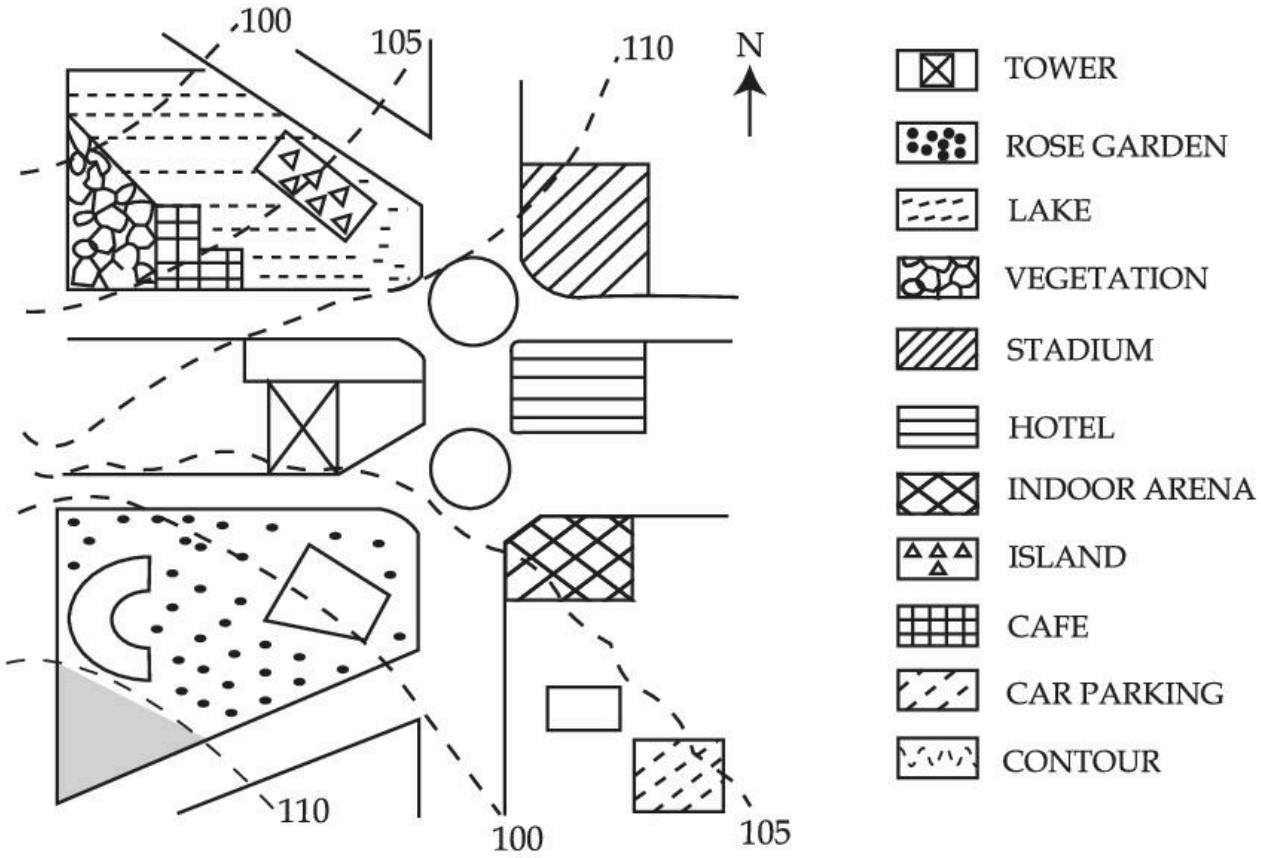
(2) West

(3) North-east

(4) South-east

103. 4 marks

With reference to the diagram, choose the correct statement.



(1) Slope of land on which stadium located is flatter than the level of land on which car parking is located.

(2) Level of land on which cafe located is steeper than the level of land on which stadium is located.

(3) Level of land on which pond located is the same as the level of the lake.

(4) Level of the rose garden is same as the level of the tower.

104. 4 marks

Today one-forth of the mankind resides in inadequate housing characterised by lack of ventilation, temporary building materials, lack of infrastructure and poor environmental quality. Numerous authors have defined such housing as slums and have loaded it with evil cannotations such as 'Squatter'. illiteracy and higher incidence of crime. A typical response towards them is to demolish or remove from the urban fabric.

In India slums are viewed as informal housing transition arising due to inability of formal channels to provide shelter supply to meet housing demand due to ever increasing migrant work force. Which is arriving in urban areas in demand of better job opportunities. Slum redevelopment programs, National Housing and Habitat policy and affordable housing policy are some of the results of shift in housing paradigm to fulfil demand of shelters. The nearest meaning of 'Squatter' in this paragraph would be.

(1) Poverty

(2) Unlawfully occupied

(3) Destitute

(4) Delinquency

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105. 4 marks

Today one forth of the mankind resides in inadequate housing characterised by lack of ventilation, temporary building materials, lack of infrastructure and poor environmental quality. Numerous authors have defined such housing as slums and have loaded it with evil cannotations such as 'Squatter', illiteracy and higher incidence of crime. A typical response towards them is to demolish or remove from the urban fabric.

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What conclusions can be drawn from this paragraph ?

(A) The perspective towards slums determine interventions.

(B) Incidence of slums is a global phenomena.

(C) Slums are result of formal system failure.

(D) Slums should be removed from the city.

(E) Slums are integral part of the city.

(1) (B), (D) only

(2) (A), (C), (E) only

(3) (A), (B), (C), (E) only

(4) (B), (C), (D) only
