JEE Main 2021 Paper 2B (B.Planning) Feb 23 Single sitting 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) 2021**, conducted by the National Testing Agency on **23 Feb 2021**.

(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 **0 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

The value of the integral $\int_{-4}^{4} |9-x^2| dx$ is :

(1) $\frac{121}{3}$

(2) $\frac{122}{3}$

(3) $\frac{125}{3}$

(4) $\frac{128}{3}$

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2. 4 marks

The sum of infinite number of terms of a Geometric Progression is 3 and the sum of the squares of its terms is $\frac{9}{2}$. The sum of the cubes of its terms is :

(1) $\frac{31}{13}$

(2) $\frac{108}{13}$

(3) $\frac{27}{2}$

(4) $\frac{54}{7}$

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3. 4 marks

Which of the following Boolean expression is a tautology ?

(1) $p \Leftrightarrow p \vee q$

(2) $(p \wedge q) \Leftrightarrow p$

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

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

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4. 4 marks

Let $|a|<1$, $|b|<1$, $|c|<1$ and $x=\sum_{n=0}^{\infty} a^n$, $y=\sum_{n=0}^{\infty} b^n$, $z=\sum_{n=0}^{\infty} c^n$. If $\frac{1}{x}, \frac{1}{y}, \frac{1}{z}$ are in Arithmetic Progression, then :

(1) a, b and c are in Arithmetic Progression

(2) a, b and c are in Geometric Progression

(3) a, 2b and c are in Arithmetic Progression

(4) a, b and c satisfy $2b^2=ac$

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5. 4 marks

$\sum_{n=1}^{\infty} \frac{2n^2+7n+5}{n!}$ is equal to :

(1) $15e+5$

(2) $15e-5$

(3) $16e-5$

(4) $16e-7$

---

6. 4 marks

The least positive integral value of λ such that $10^{50}+(3\times(4)^{52})+\lambda$ is divisible by 9 is :

(1) 5

(2) 3

(3) 7

(4) 1

---

7. 4 marks

There are 4, 5 and 6 points on the three parallel and co-planar lines. If no set of four or more points is cyclic and no set of three points lying on distinct lines is collinear, then the number of circles passing through exactly three points is :

(1) 455

(2) 421

(3) 435

(4) 441

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8. 4 marks

If $y=\frac{ax-b}{(x-1)(x-4)}$ has an extremum at the point (2, -1), then the values of a and b are :

(1) $a=1,\ b=0$

(2) $a=0,\ b=1$

(3) $a=0,\ b=-1$

(4) $a=-1,\ b=1$

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9. 4 marks

The distance between the planes $\vec{r}\cdot\left(2\hat{i}+\hat{j}-2\hat{k}\right)+5=0$ and $\vec{r}\cdot\left(6\hat{i}+3\hat{j}-6\hat{k}\right)+2=0$ is :

(1) $\frac{9}{13}$

(2) $\frac{15}{4}$

(3) $\frac{13}{9}$

(4) $\frac{1}{13}$

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10. 4 marks

The probability of solving a problem in Mathematics by two students X and Y are $\frac{1}{4}$ and $\frac{1}{5}$ respectively. If both of them try to solve the problem independently, then the probability that the problem will be solved by exactly one of them is equal to :

(1) $\frac{7}{20}$

(2) $\frac{1}{20}$

(3) $\frac{19}{20}$

(4) $\frac{12}{20}$

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11. 4 marks

The polar form of the complex number $\frac{1+i}{1-i}$ is equal to :

(1) $\cos\frac{\pi}{2}+i\sin\frac{\pi}{2}$

(2) $\cos\frac{\pi}{2}-i\sin\frac{\pi}{2}$

(3) $\cos\frac{\pi}{4}+i\sin\frac{\pi}{4}$

(4) $\cos\frac{\pi}{4}-i\sin\frac{\pi}{4}$

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12. 4 marks

If the equation of a line which divides the line segment joining the points (1, 0) and (3, 0) in the ratio 2 : 1 and is also perpendicular to it, is $ax=7$, then the value of a is equal to :

(1) 2

(2) 3

(3) 4

(4) 1

---

13. 4 marks

Equation of the circle, which is the mirror image of the circle $x^2+y^2-2x=0$ with respect to the line $x+y=2$, is :

(1) $x^2+y^2-2x+4y+3=0$

(2) $x^2+y^2-4x-2y+4=0$

(3) $2(x^2+y^2)-x+y+1=0$

(4) $x^2+y^2-2x-4y+3=0$

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14. 4 marks

Equations of the common tangent of the ellipse $\frac{(x+1)^2}{2^2}+\frac{(y-1)^2}{3^2}=1$ and the circle $(x+1)^2+(y-1)^2=4$ are :

(1) $y+3=0$ and $x-1=0$

(2) $x-3=0$ and $y+1=0$

(3) $x+3=0$ and $x-1=0$

(4) $y+3=0$ and $y-1=0$

---

15. 4 marks

If $A=\begin{bmatrix}1 & a\\ 0 & 1\end{bmatrix}$, then A^k $(k\in N)$ is :

(1) $\begin{bmatrix}1 & ka\\ 0 & 1\end{bmatrix}$

(2) $\begin{bmatrix}1 & k^2a\\ 0 & 1\end{bmatrix}$

(3) $\begin{bmatrix}k & ka\\ 0 & k\end{bmatrix}$

(4) $\begin{bmatrix}1 & ka\\ 0 & 0\end{bmatrix}$

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16. 4 marks

The values of s and t, for which the system of equations

$$x_1+x_2+x_3=5$$
$$x_1+2x_2+3x_3=9$$
$$x_1+3x_2+sx_3=t$$

has no solution, are :

(1) $s=5,\ t=13$

(2) $s\neq 5$

(3) $s=5,\ t\neq 13$

(4) $t\neq 13$

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17. 4 marks

Derivative of $\tan^{-1}\left(\frac{2x}{1-x^2}\right)$ with respect to $\sin^{-1}\left(\frac{2x}{1+x^2}\right)$ in $(1,\infty)$, is :

(1) 1

(2) -1

(3) 0

(4) 2

---

18. 4 marks

Let $\vec{a}$, $\vec{b}$ and $\vec{c}$ be three vectors such that $|\vec{a}|=|\vec{b}|=\frac{|\vec{c}|}{2}=1$. If $\vec{a}\times(\vec{a}\times\vec{c})+\vec{b}=\vec{0}$, then the acute angle between $\vec{a}$ and $\vec{c}$ is :

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

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

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

(4) $\frac{5\pi}{12}$

---

19. 4 marks

Solution of the differential equation $(1+y^2)dx=(\tan^{-1}y-x)dy$ is :
(where c is an arbitrary constant)

(1) $x=1-\tan^{-1}y+ce^{-\tan^{-1}y}$

(2) $y=\tan^{-1}y-1+ce^{-\tan^{-1}x}$

(3) $x=\tan^{-1}y-1+ce^{-\tan^{-1}y}$

(4) $x=-\tan^{-1}y-1-ce^{\tan^{-1}x}$

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20. 4 marks

The values of x, for which the vectors $\vec{a}=(x^2-16)\hat{i}+4\hat{j}-(x^2-25)\hat{k}$ make acute angles with the (positive directions of) coordinate axes lie in :

(1) $[-5,\ -4]\cup[4,\ 5]$

(2) $[-5,\ 4)\cup(-4,\ 5]$

(3) $(-5,\ -4)\cup(4,\ 5)$

(4) $(-5,\ 4)\cup(-4,\ 5)$

Mathematics Section B

21. Numerical value · 4 marks

$\int_0^{\pi} \sqrt{\frac{1+\cos 2x}{2}}\, dx$ is _____.

22. Numerical value · 4 marks

The minimum value of $9\tan^2\theta + 4\cot^2\theta$ is _____.

23. Numerical value · 4 marks

The length of the perpendicular from the point (1, 2, 3) to the line $\frac{-x+6}{-3} = \frac{y-7}{2} = \frac{z-7}{-2}$ is _____.

24. Numerical value · 4 marks

If $\log_3 2$, $\log_3(2^x - 5)$ and $\log_3\left(2^x - \frac{7}{2}\right)$ are in Arithmetic Progression, then the value of x is _____.

25. Numerical value · 4 marks

If $x^2 + x + 1 = 0$, then $-\left\{\left(x - \frac{1}{x}\right)^2 + \left(x^2 - \frac{1}{x^2}\right)^2 + \left(x^3 - \frac{1}{x^3}\right)^2\right\}$ is _____.

26. Numerical value · 4 marks

$x^2 + y^2 - 4x - 2y - 11 = 0$ is a circle to which tangents are drawn from the point (4, 5) which form a quadrilateral with a pair of radii. The area of this quadrilateral in square units is _____.

27. Numerical value · 4 marks

If the sum of mean and variance of a binomial distribution is 15 and the sum of their squares is 117, then the number of independent trials is equal to _____.

28. Numerical value · 4 marks

Let the equation of the plane passing through the points (1, 2, 6), (2, 5, 7) and perpendicular to the plane $4x-y+z=15$ be $ax+by+cz+d=0$. If a, b, c, $d \in \mathbf{Z}$ with gcd $(|a|, |b|, |c|)=1$, then $|a+b+c+d|$ is equal to _____.

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29. Numerical value · 4 marks

The number of real solutions in the interval $\left[-\frac{3\pi}{2}, \frac{7\pi}{2}\right]$ of the equation $4\sin^2 x-8\sin x+3=0$ is _____.

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30. Numerical value · 4 marks

Let $A_1, A_2, A_3, \ldots\ldots$ be an increasing geometric progression. If $\frac{1}{A_4}+\frac{1}{A_8}=\frac{10}{63}$ and $A_5A_7=441$, then $3(A_2+A_4)$ is equal to _____.

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31. 4 marks

Which among the following is the full form of the 'UNESCO' ?

(1) United Nations Educational, Scientific & Cultural Organization.

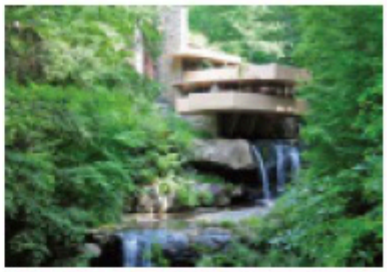
(2) United Nations Educational Security Cultural Organization.

(3) United Nations Entrance Site Calling Organization.

(4) United Nations Educational, Sustainable & Cultural Organization.

32. 4 marks

Match List - I with List - II.

List - I		List - II
(I) Hall of Nation	(a)	
(II) Falling Water, Pennsylvania	(b)	
(III) Petronas Tower	(c)	
(IV) Secretariat	(d)	

(1) (I)-(b), (II)-(a), (III)-(d), (IV)-(c)

(2) (I)-(c), (II)-(d), (III)-(a), (IV)-(b)

(3) (I)-(a), (II)-(b), (III)-(c), (IV)-(d)

(4) (I)-(b), (II)-(a), (III)-(c), (IV)-(d)

33. 4 marks

Match List - I with List - II.

	List - I		List - II
(I)	Kamru	(a)	Victoria Memorial Hall
(II)	Delhi	(b)	Badrinath Temple
(III)	Fatehpur Sikri	(c)	Khirki Masjid
(IV)	Kolkata	(d)	Buland Darwaja

(1) (I)-(b), (II)-(c), (III)-(d), (IV)-(a)

(2) (I)-(b), (II)-(d), (III)-(c), (IV)-(a)

(3) (I)-(c), (II)-(a), (III)-(b), (IV)-(d)

(4) (I)-(b), (II)-(a), (III)-(d), (IV)-(c)

34. 4 marks

Match List - I with List - II.

List - I	List - II
(I) Agra fort	(a) 
(II) Atala Masjid	(b) 
(III) Nalanda University	(c) 
(IV) Jagannatha Temple	(d) 

(1) (I)-(b), (II)-(c), (III)-(a), (IV)-(d)

(2) (I)-(a), (II)-(b), (III)-(c), (IV)-(d)

(3) (I)-(c), (II)-(a), (III)-(d), (IV)-(b)

(4) (I)-(b), (II)-(a), (III)-(c), (IV)-(d)

35. 4 marks

Match List - I with List - II.

	List - I		List - II
(I)	Yadvindra Garden	(a)	Manali
(II)	Vishnu Temple	(b)	Amritsar
(III)	Hidimba Temple	(c)	Pinjore
(IV)	Hari Mandir	(d)	Buniyar

(1) (I)-(c), (II)-(d), (III)-(b), (IV)-(a)

(2) (I)-(c), (II)-(d), (III)-(a), (IV)-(b)

(3) (I)-(d), (II)-(b), (III)-(c), (IV)-(a)

(4) (I)-(b), (II)-(d), (III)-(a), (IV)-(c)

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36. 4 marks

Match List - I with List - II.

	List - I		List - II
(I)	Mehrangarh Fort	(a)	Hyderabad
(II)	Siri Fort	(b)	Kolkata
(III)	Golconda Fort	(c)	Delhi
(IV)	Fort William	(d)	Jodhpur

Choose the correct answer from options given below :

(1) (I)-(a), (II)-(d), (III)-(b), (IV)-(c)

(2) (I)-(d), (II)-(c), (III)-(a), (IV)-(b)

(3) (I)-(d), (II)-(c), (III)-(b), (IV)-(a)

(4) (I)-(a), (II)-(b), (III)-(d), (IV)-(c)

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37. 4 marks

Book 'God of small things' is written by which Indian Architect ?

(1) B.V. Doshi

(2) Arundhati Roy

(3) Revati Kamat

(4) Bimal Patel

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38. 4 marks

'Jharokha' is a type of window mostly found in :

(1) Gujarat

(2) West Bengal

(3) Tamil Nadu

(4) Rajasthan

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39. 4 marks

The monsoon wind enters in Indian sub-continent from which direction ?

(1) North-West side
(2) South-East side
(3) North side
(4) South-West side

40. 4 marks

Which of the following building represents the colonial Architectural pattern in India ?

(1) Bharat Bhavan in Bhopal
(2) LIC Building in Delhi
(3) Charminar in Hyderabad
(4) Victoria Memorial in Kolkata

41. 4 marks

What is the size of A2 Drawing sheet ?

(1) 420×590 (mm $\times$ mm)
(2) 420×594 (mm $\times$ mm)
(3) 297×420 (mm $\times$ mm)
(4) 420×592 (mm $\times$ mm)

42. 4 marks

Victory Tower belongs to which of the following fort :

(1) Chittor fort
(2) Jaigarh fort
(3) Bhangarh fort
(4) Amer fort

43. 4 marks

Which amongst the following Architect has designed the famous Temple "Akshardham" ?

(1) Sanjay Puri
(2) Vikram Lall
(3) Ashok Lall
(4) C. Sompura

44. 4 marks

'Volume Zero' Documentary is on which Architect ?

(1) Charles Correa
(2) Richard Mier
(3) Jasbir Sachdev
(4) Ranjit Sabliki

collegedunia

45. 4 marks

'Agenda 21' is declaration related with :

(1) Climate change
(2) Global warming
(3) Sustainable development
(4) Smart city

46. 4 marks

Gold mines are situated in which state of India ?

(1) Karnataka
(2) Orissa
(3) Maharashtra
(4) Uttar Pradesh

47. 4 marks

In the Southern Hemisphere shadowless light is from which direction ?

(1) North
(2) South
(3) East
(4) West

48. 4 marks

The first Indian Architect who has won Pritzker Prize in 2018 is :

(1) B.V. Doshi
(2) Laurie Baker
(3) Raj Rewal
(4) Achyut Kanvinde

49. 4 marks

Word "Bungalow" has originated from :

(1) Bengalurm
(2) Banaras
(3) Bengal
(4) Bari

50. 4 marks

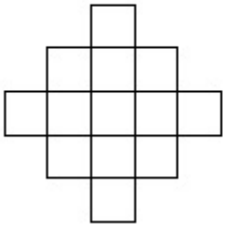
The IIM - Ahmedabad is designed by which of the following Architect ?

(1) Laurie Baker
(2) Louis Kahn
(3) Lutyen
(4) Le Corbusier

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51. 4 marks

In the given figure, how many squares are present ?



(1) 14

(2) 13

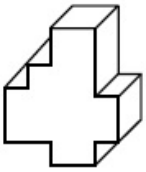
(3) 15

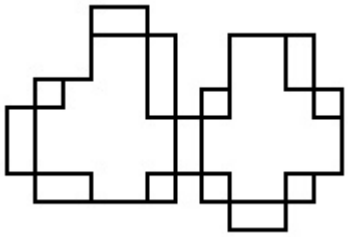
(4) 18

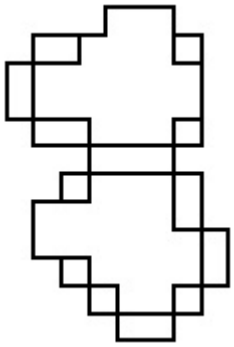
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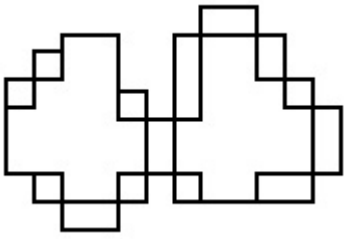
52. 4 marks

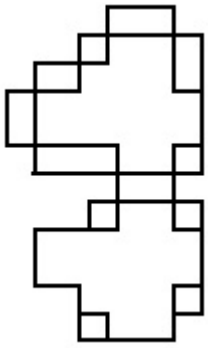
A drawing is provided with all the folds to construct the following three Dimensional object. Select the correct one.



(1) 

(2) 

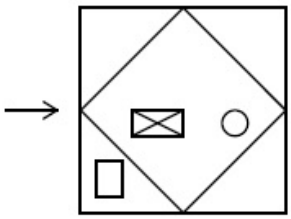
(3) 

(4) 

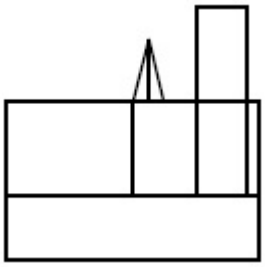
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53. 4 marks

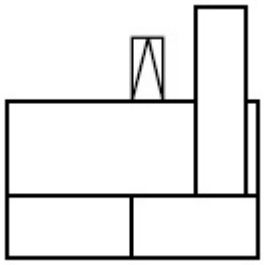
The problem figure shows the top view of an object. Identify the correct view looking in the direction of arrow, amongst the answer figures.



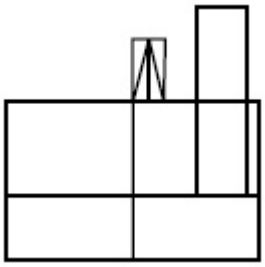
(1)



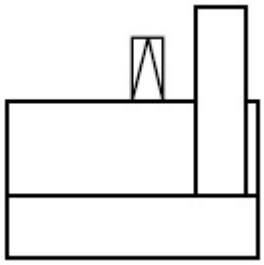
(2)



(3)

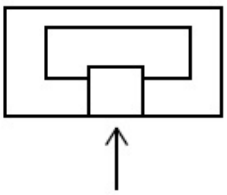


(4)

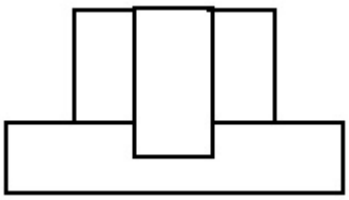


54. 4 marks

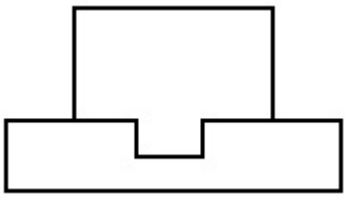
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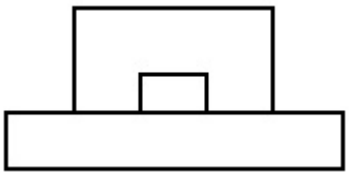
(1)



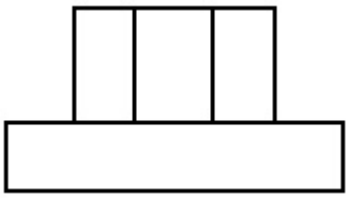
(2)



(3)

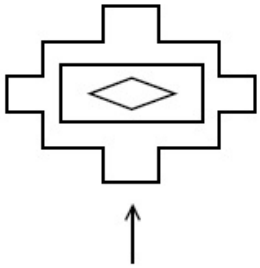


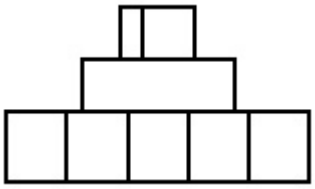
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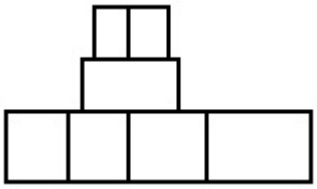


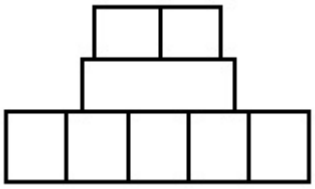
55. 4 marks

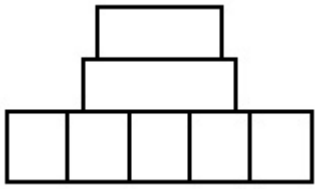
The problem figure shows the top view of an object. Identify the correct elevation amongst the answer figures looking in the direction of arrow.



(1) 

(2) 

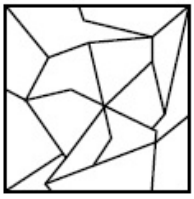
(3) 

(4) 

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56. 4 marks

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



(1) 

(2) 

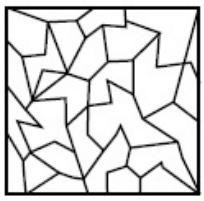
(3) 

(4) 

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57. 4 marks

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



(1) 

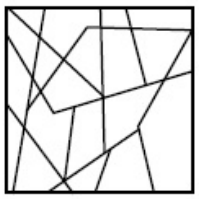
(2) 

(3) 

(4) 

58. 4 marks

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



(1) 

(2) 

(3) 

(4) 

59. 4 marks

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



(1) 

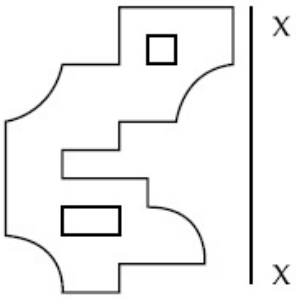
(2) 

(3) 

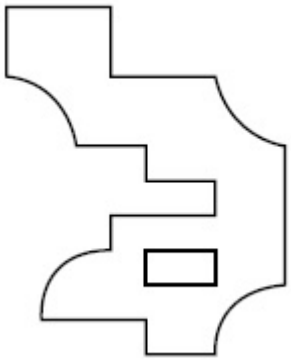
(4) 

60. 4 marks

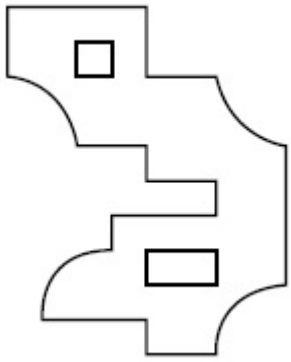
Which one of the answer figures is correct mirror image of problem figure with respect to X-X ?



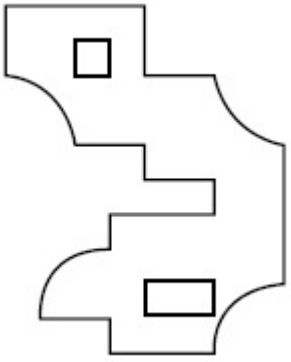
(1)



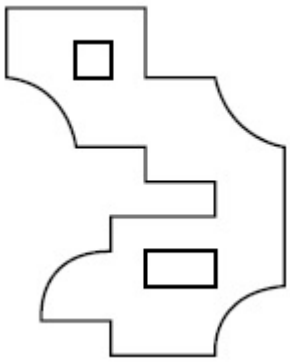
(2)



(3)

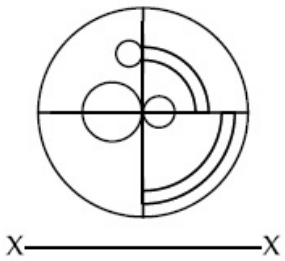


(4)

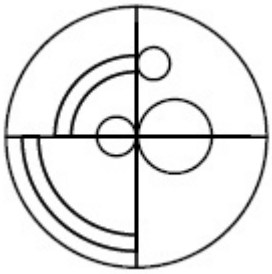


61. 4 marks

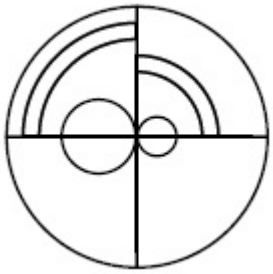
Which one of the answer figures is the correct mirror image of the problem figure with respect to X-X ?



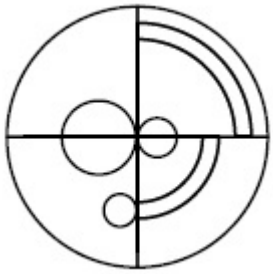
(1)



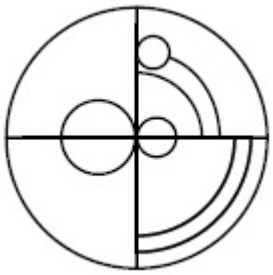
(2)



(3)

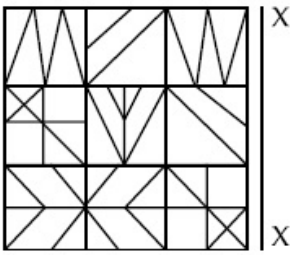


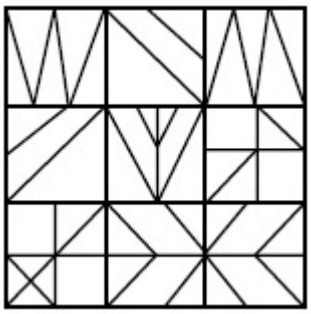
(4)

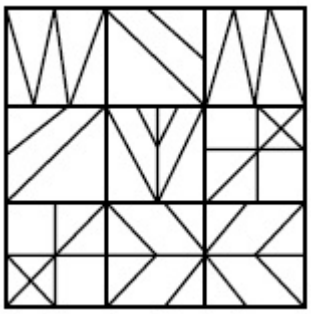


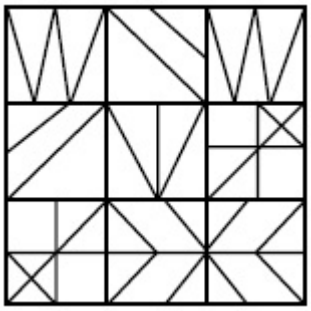
62. 4 marks

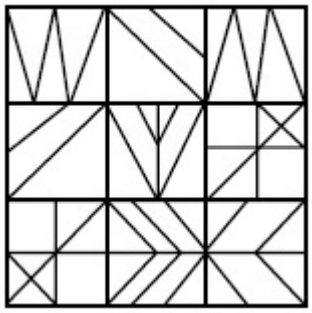
Which one of the answer figures is the correct mirror image of the problem figure with respect to X-X ?



(1) 

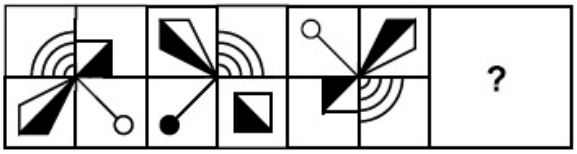
(2) 

(3) 

(4) 

63. 4 marks

Which one of the answer figures complete the sequence of the problem figure ? Select the correct one.



(1) 

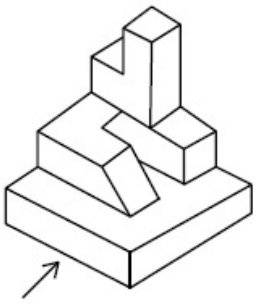
(2) 

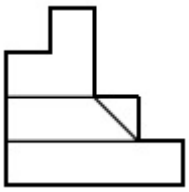
(3) 

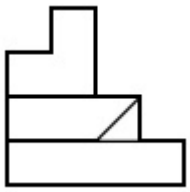
(4) 

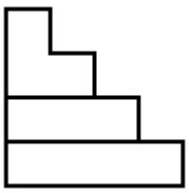
64. 4 marks

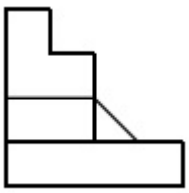
The 3D figure shows the view of an object. Identify the correct view looking in the direction of arrow, amongst the answer figures.



(1) 

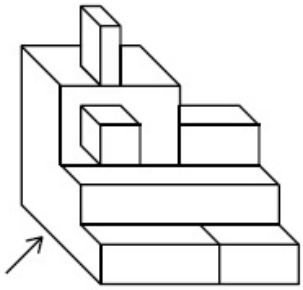
(2) 

(3) 

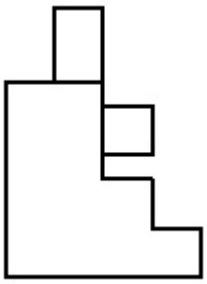
(4) 

65. 4 marks

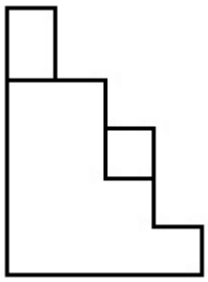
The 3D figure shows the view of an object. Identify the correct view looking in the direction of arrow, amongst the answer figures.



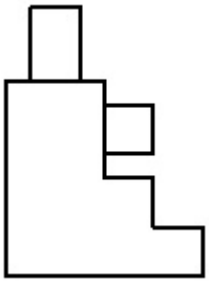
(1)



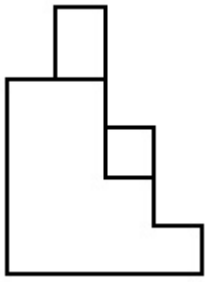
(2)



(3)

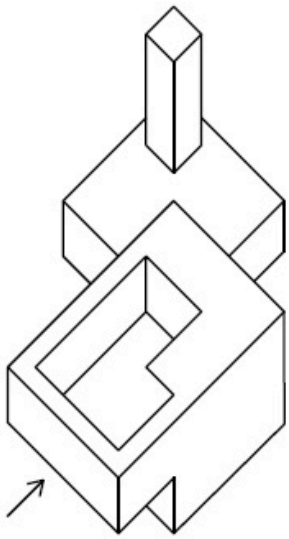


(4)

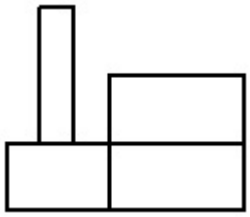


66. 4 marks

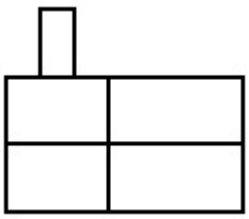
The 3D figure shows the view of an object. Identify the correct view looking in the direction of arrow, amongst the answer figures.



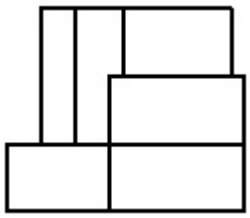
(1)



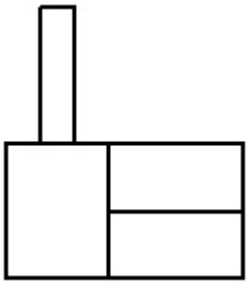
(2)



(3)

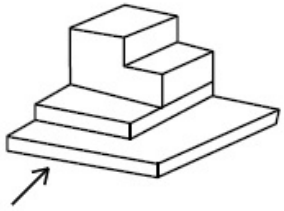


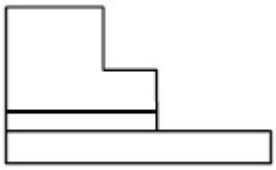
(4)

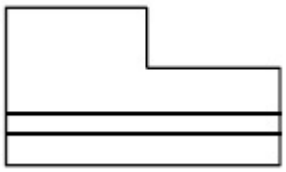


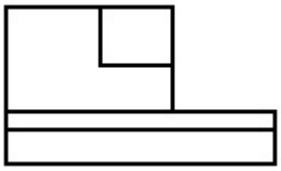
67. 4 marks

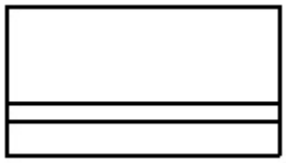
The 3D figure shows the view of an object. Identify the correct view looking in the direction of arrow, amongst the answer figures.



(1) 

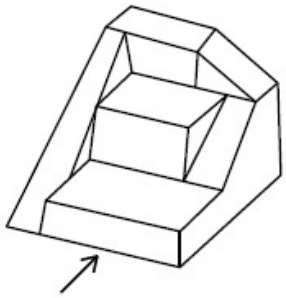
(2) 

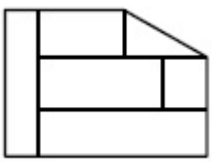
(3) 

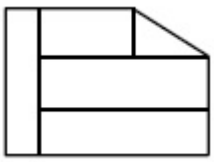
(4) 

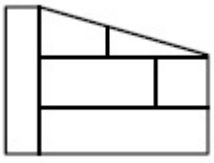
68. 4 marks

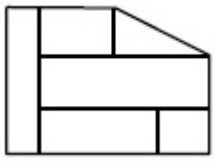
The 3D figure shows the view of an object. Identify the correct view looking in the direction of arrow, amongst the answer figures.



(1) 

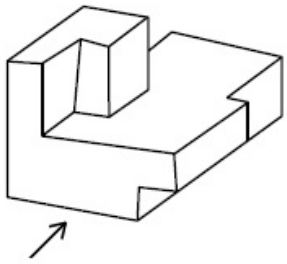
(2) 

(3) 

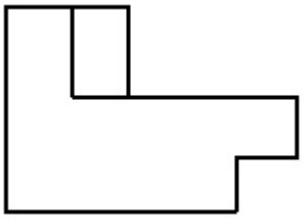
(4) 

69. 4 marks

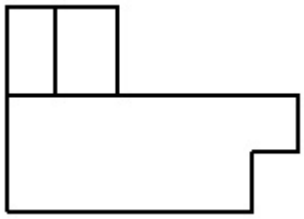
The 3D figure shows the view of an object. Identify the correct view looking in the direction of arrow, amongst the answer figures.



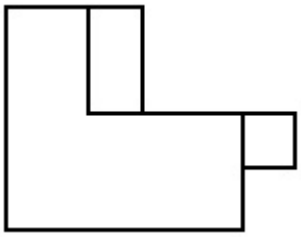
(1)



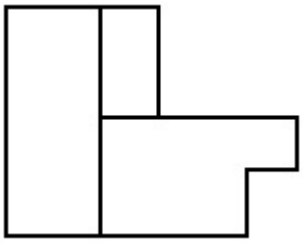
(2)



(3)

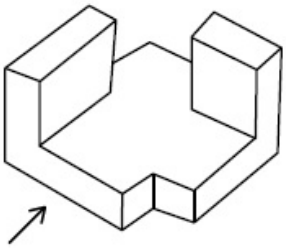


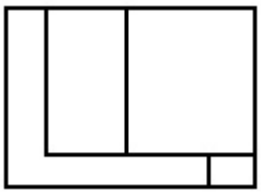
(4)

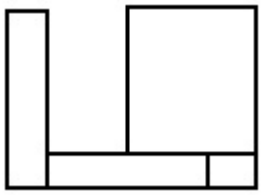


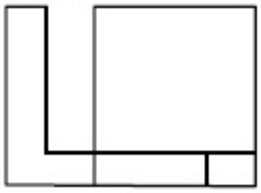
70. 4 marks

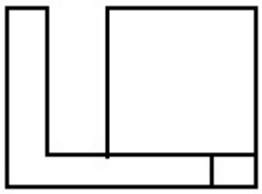
The 3D figure shows the view of an object. Identify the correct view looking in the direction of arrow, amongst the answer figures.



(1) 

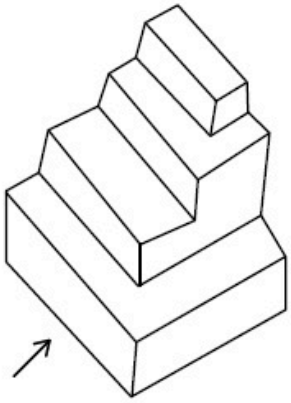
(2) 

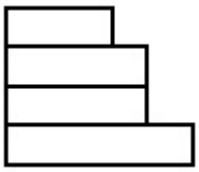
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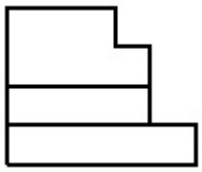
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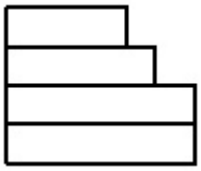
71. 4 marks

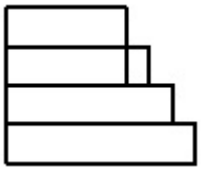
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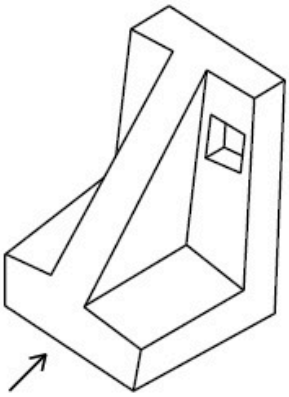
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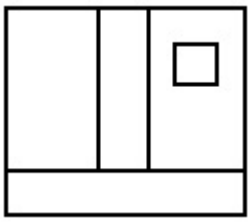
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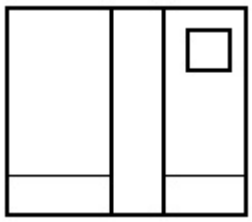
(4) 

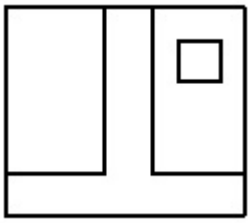
72. 4 marks

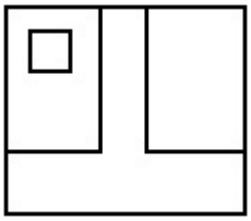
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(1) 

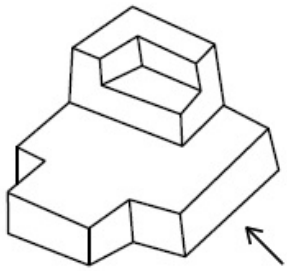
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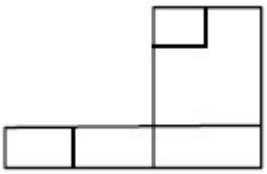
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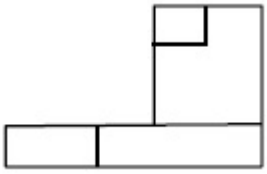
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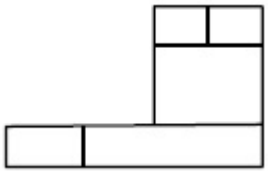
73. 4 marks

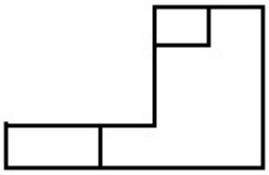
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(1) 

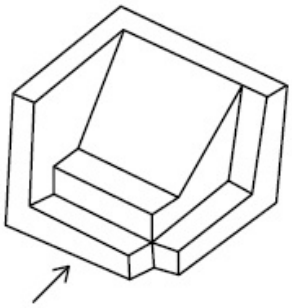
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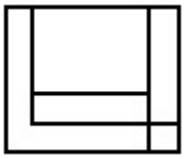
(3) 

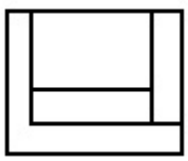
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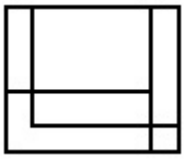
74. 4 marks

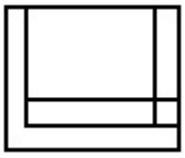
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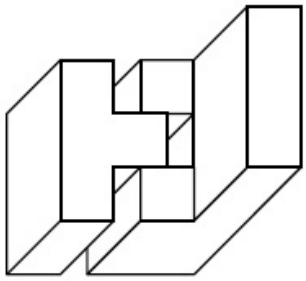
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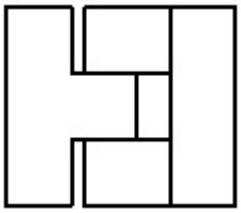
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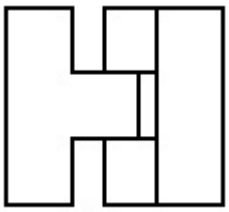
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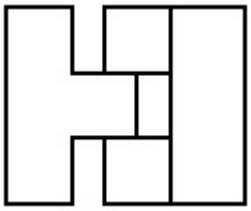
75. 4 marks

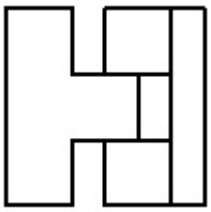
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(1) 

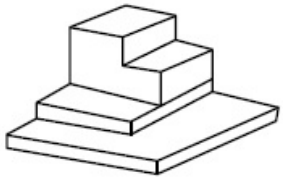
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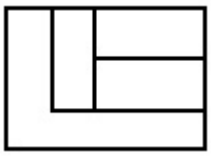
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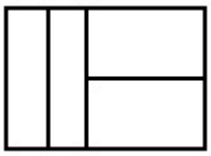
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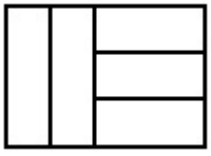
76. 4 marks

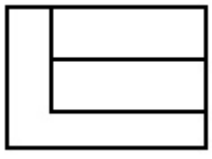
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(1) 

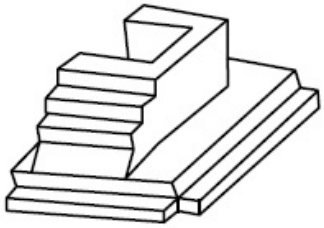
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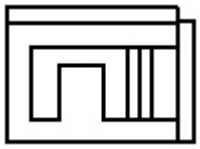
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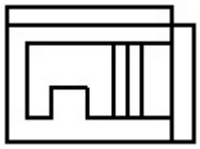
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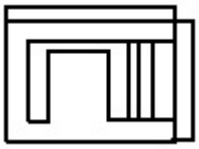
77. 4 marks

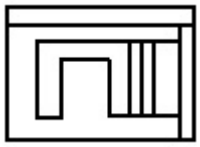
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(1) 

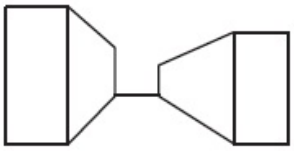
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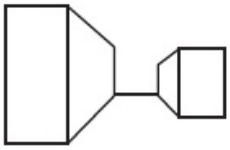
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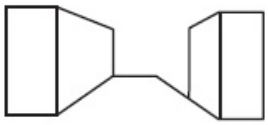
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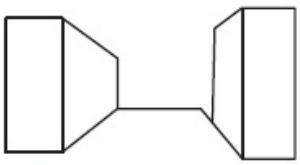
78. 4 marks

Identify the building compositions of having less visual tension amongst the following figures.

(A) 

(B) 

(C) 

(D) 

(1) (A) and (B)

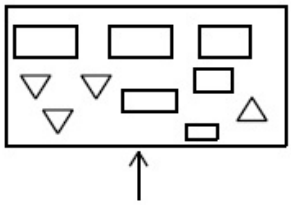
(2) (B) and (C)

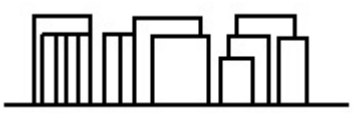
(3) (C) and (D)

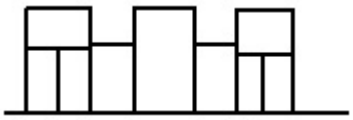
(4) (D) and (A)

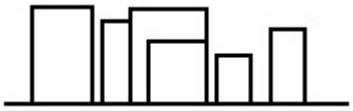
79. 4 marks

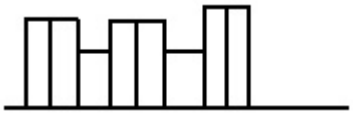
The problem figure shows the top view of an object. Identify the correct elevation amongst the answer figures looking in the direction of arrow.



(1) 

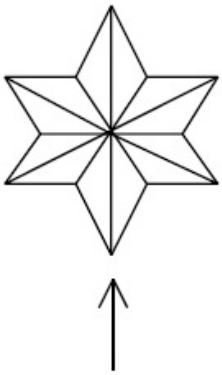
(2) 

(3) 

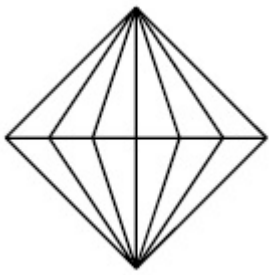
(4) 

80. 4 marks

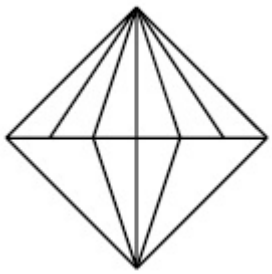
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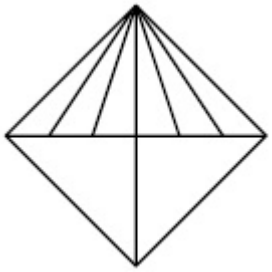
(1)



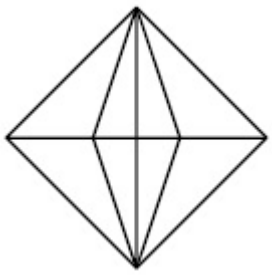
(2)



(3)



(4)



Planning

81. 4 marks

Which of these industries did not exist in London before the first world war ?

(1) Automobile
(2) Clothing and Textile
(3) Printing
(4) Iron and Steel

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82. 4 marks

A carbon footprint is the amount of _____ released into the atmosphere.

(1) Nitrogen
(2) Greenhouse gas
(3) Ozone
(4) Suspended Particulate Matter (SPM)

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83. 4 marks

A. KodaiKanal
B. Kullu
C. Mount Abu
D. Panchgani
E. Pahalgam

Arrange the above hill stations in the correct sequence from south to north in India.
Choose the correct answer from the options given below :

(1) $E \rightarrow D \rightarrow B \rightarrow A \rightarrow C$
(2) $E \rightarrow B \rightarrow C \rightarrow D \rightarrow A$
(3) $C \rightarrow A \rightarrow B \rightarrow D \rightarrow E$
(4) $A \rightarrow D \rightarrow C \rightarrow B \rightarrow E$

---

84. 4 marks

Planning Commission in India has been replaced by :

(1) Mo HUA
(2) NITI Aayog
(3) NIUA
(4) PFI

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85. 4 marks

When was the special Economic Zone's Act enacted in India ?

(1) 2005
(2) 2007
(3) 2009
(4) 2011

86. 4 marks

What is the full form of NHAI ? Choose the correct answer.

(1) National Horticulture Association of India.
(2) National Heritage Authority of India.
(3) National Hydroelectric Power Authority of India.
(4) National Highway Authority of India.

87. 4 marks

How many Sustainable Development Goals were adopted by the United Nations ?

(1) 15
(2) 16
(3) 17
(4) 18

88. 4 marks

In which year, the first industrial policy by Government of India was announced ?

(1) 1947
(2) 1948
(3) 1950
(4) 1949

89. 4 marks

Planning of Barcelona city in Spain is known for its :

(1) superblocks
(2) radial pattern
(3) high rise development
(4) waterbased transport

90. 4 marks

Which of these is not an industrial city ?

(1) Durgapur
(2) Vishakhapatnam
(3) Bhubaneshwar
(4) Bhilai

91. 4 marks

Which of these schemes / programmes by Government of India is linked to heritage cities ?

(1) AMRUT
(2) Make in India
(3) HRIDAY
(4) UDAY

92. 4 marks

Which one of the following south Indian states has the highest ground water utilization (in percent) of its total groundwater potential ?

(1) Tamil Nadu
(2) Karnataka
(3) Andhra Pradesh
(4) Kerala

93. 4 marks

Survey of India was established in :

(1) 1886
(2) 1876
(3) 1866
(4) 1896

94. 4 marks

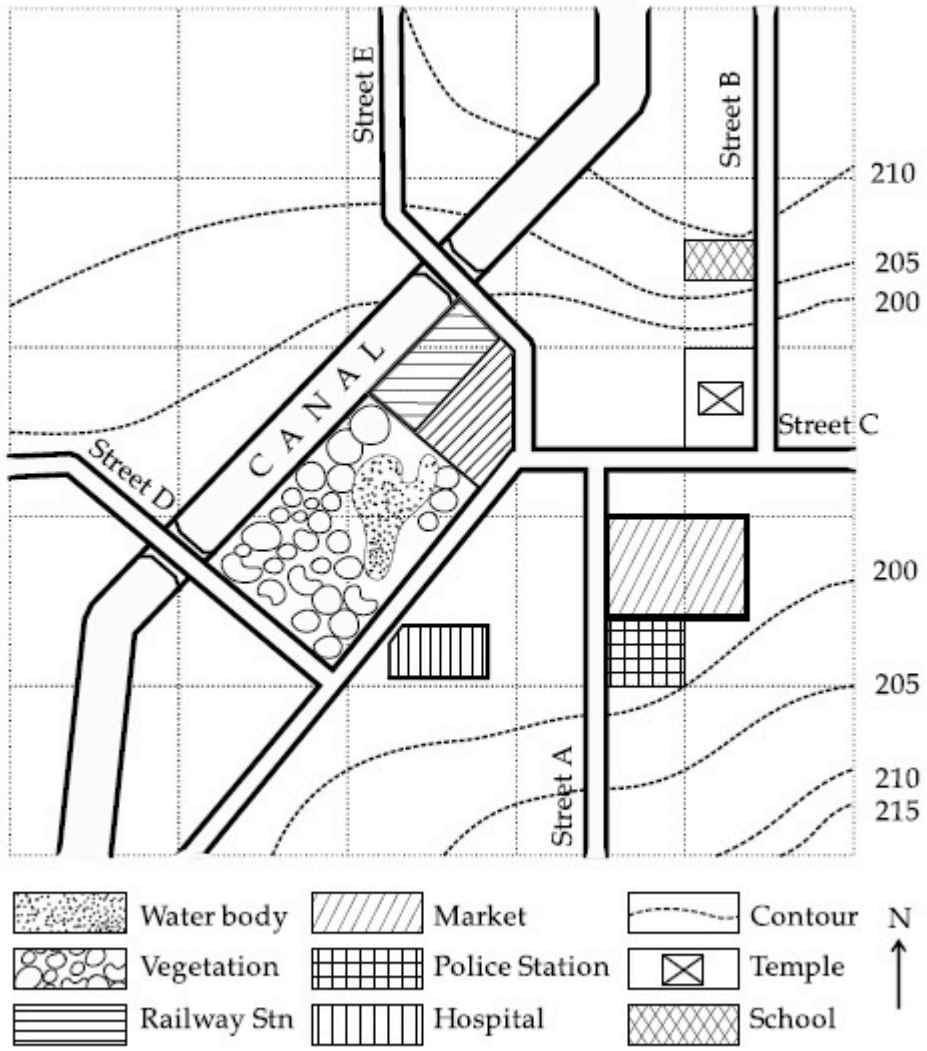
As per 73rd amendment act (73rd CAA) 1992 first time one third (1/3) reservation for women was provided in which of the following ?

(1) Lok Sabha
(2) State Legislative Assembly
(3) Cabinets
(4) Panchayati Raj bodies

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95. 4 marks

Map Reading.



With reference to the diagram, choose the correct statement.

(1) Slope of land on which school is located is flatter than the slope of land on which hospital is located.

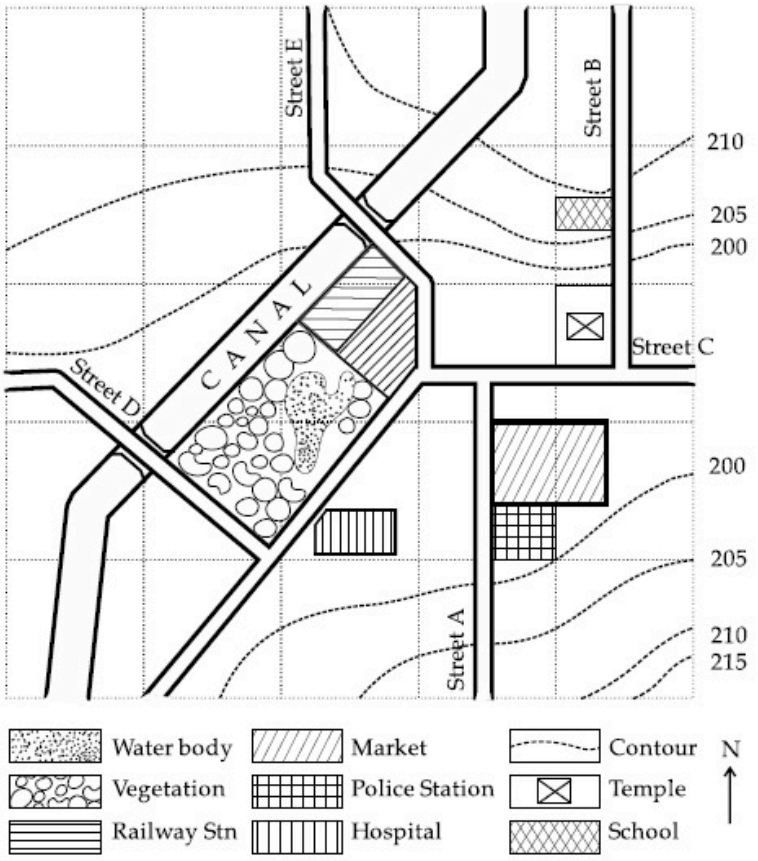
(2) Slope of land on which police station is located is steeper than the slope of land on which school is located.

(3) Slope of land on which school is located is steeper than the slope of land on which temple is located.

(4) Slope of land on which school is located is the same as the slope of land on which temple is located.

96. 4 marks

Map Reading.



In the given diagram, for a person to travel from railway station to temple, one will have to move in _____ direction.

(1) North

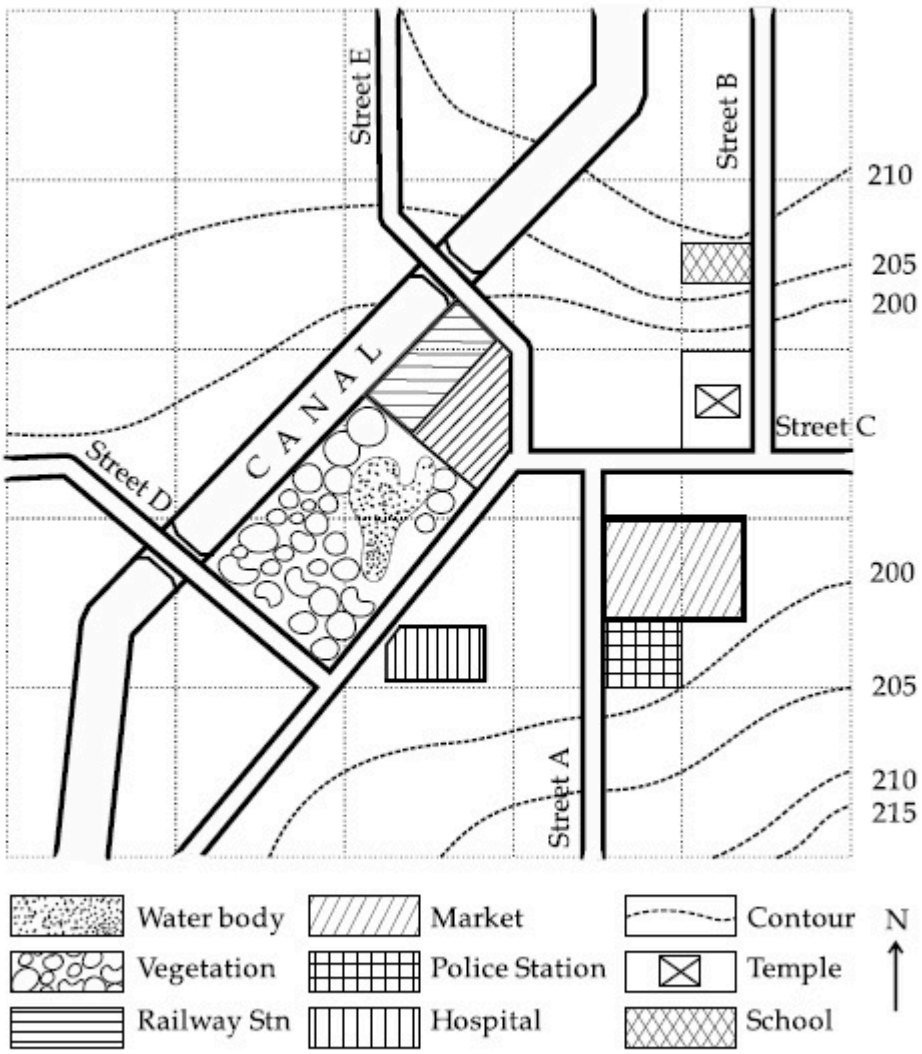
(2) North - East

(3) South - West

(4) East

97. 4 marks

Map Reading.



In the given diagram, water body is located at a level :

(1) 5 m higher than police station.

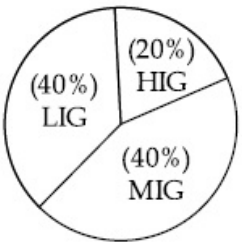
(2) 5 m higher than school.

(3) same level as police station.

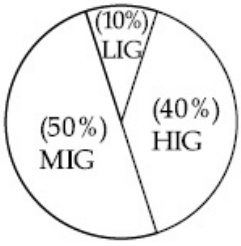
(4) same level as school.

98. 4 marks

The following pie-charts show the distribution of students enrolled in higher secondary and in college education, with respect to the household income of their families.



Higher Secondary Education



College Education

The ratio between the number of students from LIG household category studying at higher secondary to those in college is :

(1) 4 : 1

(2) 1 : 5

(3) 6 : 1

(4) 1 : 4

99. 4 marks

The surface area of earth is 510 million km^2. The land area is thirty percent of total surface. Urban land is three percent of total land surface. World population is 7.8 billion and fifty five percent is urban population. Find the closest correct answer.

(1) The density of population in urban area is 1000 persons/sq.km.

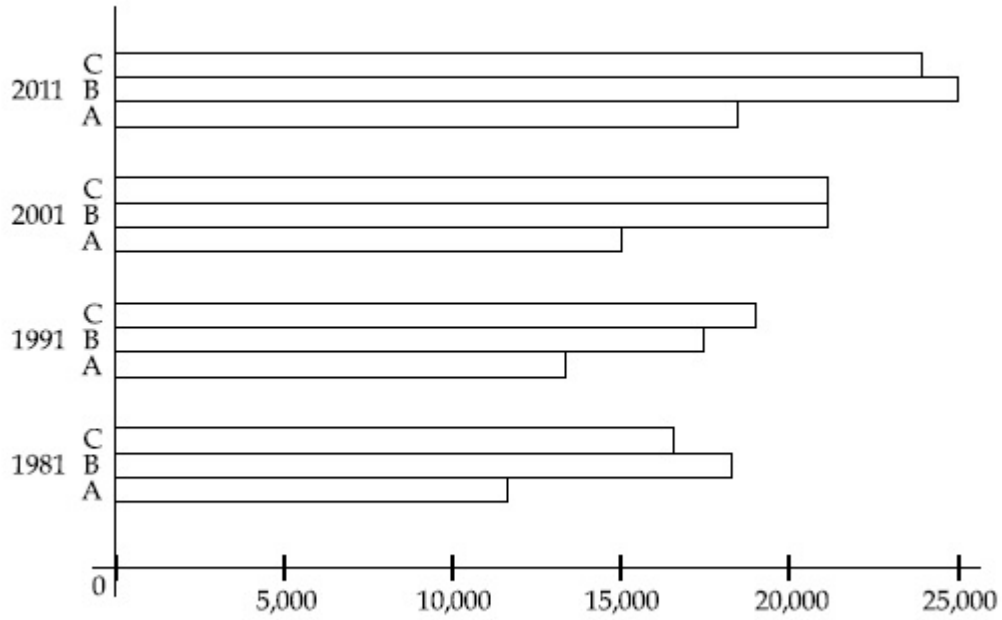
(2) The density of population in urban area is 849 persons/sq.km.

(3) The density of population in urban area is 4290 persons/sq.km.

(4) The density of population in urban area is 7800 persons/sq.km.

100. 4 marks

Population of city A, B and C from 1981–2011.



Choose the correct statement :

(1) City A shows the increase in population from 1981 to 2011 and city C does not show the increase likewise.

(2) City B shows a continuous decline in population from 1981–2011 whereas city A shows an increase.

(3) Population in city A is increasing in each decade from 1981 to 2001 whereas city B shows a decline from 1981 to 1991 and then it increases from 1991 to 2001.

(4) City C shows continuous decline in population in various decades whereas city B shows increase.

101. 4 marks

In a survey, the speeds of 100 vehicles were observed. The following table gives the distribution of vehicle speed and the corresponding number of vehicles.

Vehicle Speed ($kmhr^{-1}$)	No. of Vehicles
20	6
25	20
28	24
29	28
33	15
38	4
40	2
45	1

The median speed of the vehicles is :

(1) $26\ kmhr^{-1}$

(2) $21.5\ kmhr^{-1}$

(3) $30\ kmhr^{-1}$

(4) $28.5\ kmhr^{-1}$

102. 4 marks

Hundreds of Shanty towns line the river banks, train tracks, and garbage dumps in the Filipino capital. Around a quarter of its 12 million are considered 'informal settlers'. Manila is starkly representative of a global problem. According to the United Nations, about a quarter of the World's urban population lives in slums.

Slum tourism takes outsiders through their most impoverished marginalized districts. Slum tourism sparks considerable debate around an uncomfortable moral dilemma. Many consider the practice little more than slack-jawed privileged people gawking at those less fortunate. Others argue they raise awareness and provide numerous examples of giving back to the local communities.

Which of the following best justify 'Slum Tourism' in the above paragraph ?

(1) As a charity by privileged people.

(2) As a way to reduce crime.

(3) As a way to sensitize travellers about poor living conditions in the society.

(4) As an adventure activity.

103. 4 marks

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The nearest meaning of 'Gawking' in this paragraph would be :

(1) Learning
(2) Staring
(3) Peeping
(4) Gloating

104. 4 marks

Given below are two statements : one is labelled as **Assertion A** and the other is labelled as **Reason R.**

Assertion A : Over the last two decades collective attention span is decreasing.

Reason R : Quick availability and rapid access to large amount of information leads to loss of interest in one topic very quickly.

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

(1) Both **A** and **R** are true and **R** is the correct explanation of **A**
(2) Both **A** and **R** are true but **R** is NOT the correct explanation of **A**
(3) **A** is true but **R** is false
(4) **A** is false but **R** is true

105. 4 marks

Given below are two statements : one is labelled as **Assertion A** and the other is labelled as **Reason R :**

Assertion A : In past two decades, rate of divorce has increased in India.

Reason R : Increasing number of married couples do not want to have children.

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

(1) Both **A** and **R** are true and **R** is the correct explanation of **A**
(2) Both **A** and **R** are true but **R** is NOT the correct explanation of **A**
(3) **A** is true but **R** is false
(4) **A** is false but **R** is true

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