JEE Main 2021 Paper 2B (B.Planning) Sep 2 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 **2 Sep 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 domain of the function, $f(x) = \sqrt{\frac{\log_{0.6}|x-2|}{|x|}}$ is :

(1) $[1, 2) \cup [3, \infty)$

(2) $[1, 2) \cup (2, 3]$

(3) $(0, 1) \cup (2, 3]$

(4) $(-\infty, 0) \cup [1, 2)$

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2. 4 marks

Let α and β be the roots of the quadratic equation $x^2 + \sqrt{3}\,x + 1 = 0$.
Then $\alpha^{2022} + \beta^{2022}$ is equal to :

(1) 2

(2) -2

(3) 0

(4) $-\sqrt{3}$

---

3. 4 marks

If $A = \begin{pmatrix} 0 & 0 & 2 \\ 1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$, then :

(1) $A^6 = 2\,A^3$

(2) $2A^6 = A^3$

(3) $A^{12} = 4\,A^6$

(4) $A^{12} = 2\,A^6$

---

4. 4 marks

The sum of all values of λ, for which the system of equations

$x+y+z=1$

$x+2y+4z=\lambda$

$x+4y+10z=\lambda^2$

has infinitely many solutions, is :

(1) 2

(2) -2

(3) 3

(4) -3

---

5. 4 marks

Let $f(x)=\max\{x^2, x^3\}$ for all $x \in \mathbf{R}$. Then which of the following is **NOT** true ?

(1) f is continuous for all x.

(2) f is not differentiable exactly at one point in $\mathbf{R}$.

(3) f is not differentiable exactly at two points in $\mathbf{R}$.

(4) $f'\left(-\frac{1}{2}\right)+f'\left(\frac{1}{8}\right)+f'\left(\frac{3}{2}\right)=6$

---

6. 4 marks

The sum of the series

$$\frac{1}{6}+\frac{5}{6^2}+\frac{19}{6^3}+\ldots+\frac{3^{10}-2^{10}}{3^{10}\cdot 2^{10}} \text{ is :}$$

(1) $\frac{511}{2^{10}}$

(2) $1+\frac{2^9-3^{10}}{6^{10}}$

(3) $\frac{(255)\cdot 3^{10}+2^9}{6^{10}}$

(4) $\frac{(511)\cdot 3^{10}+2^9}{6^{10}}$

---

7. 4 marks

$$\lim_{x\to 0} \frac{1}{x^2}\left(e^{x^2} - \cos\frac{x}{2}\right) \text{ is equal to :}$$

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

(2) $\frac{5}{8}$

(3) $\frac{9}{8}$

(4) $\frac{9}{4}$

---

8. 4 marks

If $\int\sqrt{\frac{\cos(x-\theta)}{\cos(x+\theta)}}\,dx = \alpha \sin^{-1}\left(\frac{\sin x}{\cos\theta}\right) + \beta \log_e\left|\cos x + \sqrt{\cos^2 x - \sin^2\theta}\right| + C,$

where C is a constant of integration and $\frac{\pi}{6} < \theta < \frac{\pi}{4}$, then $\alpha\sin\theta + \beta\cos\theta$ is equal to :

(1) 0

(2) 1

(3) $\cos 2\theta$

(4) $\sin 2\theta$

---

9. 4 marks

If $I = \int_0^1 \tan^{-1}(\sqrt{x}+1)\,dx$, $J = \int_0^1 \frac{\sqrt{x}\,dx}{x + 2\sqrt{x} + 2}$, then the value of $2I + J$ is equal to :

(1) $2\tan^{-1}\left(\frac{1}{2}\right)$

(2) $2\tan^{-1}(2) - \frac{\pi}{2}$

(3) $2\tan^{-1}(2)$

(4) $\tan^{-1}(2)$

---

10. 4 marks

Let $y=y(x)$ be the solution of the differential equation $x\frac{dy}{dx} = (2x + 3)e^x + xy, x > 0$.

If $y(e) = (2e+3)e^e$, then $\frac{d^2y}{dx^2} - \frac{dy}{dx}$ at $x=1$ is equal to :

(1) $3e$ (2) e

(3) 0 (4) $2e$

---

11. 4 marks

Let f be a non-zero polynomial function such that $f(3x)=f'(x)f''(x)$.
Then the value of $f(6)$ is :

(1) 648 (2) 324

(3) 136 (4) 108

---

12. 4 marks

A rod AB of length 4 units rests against a vertical wall with A on the horizontal floor. P is a point on AB such that AP : PB = 2 : 1. If the rod slides down along the wall in a vertical plane, then the point P(x, y) moves on the curve :

(1) $36x^2+9y^2=64$ (2) $36x^2+9y^2=16$

(3) $9x^2+36y^2=64$ (4) $9x^2+36y^2=16$

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13. 4 marks

Let A(1, 2) and B(3, 6) are two points on a circle of radius R, whose one of the diameters is along the line $2x-y+4=0$. Then R^2 is equal to :

(1) 17

(2) $\frac{37}{3}$

(3) $\frac{31}{5}$

(4) $\frac{41}{5}$

---

14. 4 marks

A line perpendicular to the line $4x=3y$ is a tangent to the parabola $y^2=3x+1$ at a point P on it. If S is the focus of the parabola, then the equation of the line SP is :

(1) $24x+5y=10$

(2) $24x-y=26$

(3) $24x+7y=10$

(4) $8x+y=6$

---

15. 4 marks

If a line $px+qy=12$ is a tangent to the ellipse $4x^2+9y^2=16$, then pq can **NOT** be equal to :

(1) 29

(2) 26

(3) 23

(4) 21

---

16. 4 marks

If the angle between the line $\frac{x+1}{1}=\frac{y-1}{2}=\frac{z+2}{-1}$ and the plane P : $2x-y-\lambda z+4=0$, $\lambda > 0$, is $\sin^{-1}\left(\frac{1}{9\sqrt{6}}\right)$, then the distance of the point $(-1, 1, -2)$ from the plane P is :

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

(2) 1

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

(4) $\frac{2}{9}$

---

17. 4 marks

Let the distinct numbers a, b, c be the p^{th}, q^{th} and r^{th} terms of a geometric progression of positive terms. Then the angle between the vectors $\vec{u} = (\log_e a^2)\hat{i} + (\log_e b^2)\hat{j} + (\log_e c^2)\hat{k}$ and $\vec{v} = (q-r)\hat{i} + (r-p)\hat{j} + (p-q)\hat{k}$ is :

(1) 0

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

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

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

18. 4 marks

For $0 < x < \pi$, the sum of the solutions of the equation $4^{\left(\frac{1}{2}\sin x + \frac{1}{4}\sin^2 x + \frac{1}{8}\sin^3 x + \cdots\right)} = 2^{\frac{2}{3}}$ is :

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

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

(3) π

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

19. 4 marks

The domain of the function

$$f(x) = \tan^{-1}\left(\sqrt{x^2 + x - 2}\right) + \sec^{-1}(x^2 - 5x + 3) \text{ is :}$$

(1) $(-\infty, -2] \cup [1, \infty)$

(2) $[1, 4] \cup \left[\frac{5 + \sqrt{17}}{2}, \infty\right)$

(3) $\left(-\infty, \frac{5 - \sqrt{17}}{2}\right] \cup [1, 4] \cup \left[\frac{5 + \sqrt{17}}{2}, \infty\right)$

(4) $(-\infty, -2] \cup [1, 4] \cup \left[\frac{5 + \sqrt{17}}{2}, \infty\right)$

20. 4 marks

Which of the following is equivalent to $p \leftrightarrow q$?

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

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

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

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

Mathematics Section B

21. Numerical value · 4 marks

Three fair dice are thrown. The number of ways to obtain a total of 11 is _____.

22. Numerical value · 4 marks

If a plane, that contains the line $\vec{r} = (1, -1, 1) + \lambda(2, 3, -6)$, $\lambda \in \mathbf{R}$, passes through the point (2, 0, 2) and is at a distance d from the origin, then the value of 73 d^2 is _____.

23. Numerical value · 4 marks

Number of real roots of the equation

$$\sqrt{x+2} - \sqrt{x-2} = \sqrt{4x-1} \text{ is } _____.$$

24. Numerical value · 4 marks

Between 1 and 31, n numbers have been inserted in such a way that the resulting sequence is an A.P. If the ratio of $(n-1)^{th}$ and 7^{th} inserted numbers is 9 : 5, then n is equal to _____.

25. Numerical value · 4 marks

The sum of absolute maximum and absolute minimum values of the function $f(x) = |4x^2+3x-10| + x^2 - 2x + 5$, $x \in [-3, 1]$ is _____.

26. Numerical value · 4 marks

If the area (in sq. units) of the region bounded by the curve $y = |x-2| + |2x-3| + |3x-4|$ and the line $y = 3$ is A, then 12 A is equal to _____.

27. Numerical value · 4 marks

The coefficient of $a^4b^6c^6$ in the expansion of $(ab+bc+ca)^8$ is _____.

28. Numerical value · 4 marks

The number of ordered pairs (a, b), such that the function $f(x)=4x^3-(3a+2b)x^2+2abx$ is decreasing in $\left[\frac{3}{2},\frac{5}{3}\right]$ and increasing in $\mathbf{R}-\left[\frac{3}{2},\frac{5}{3}\right]$, is _____.

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29. Numerical value · 4 marks

Three numbers are randomly picked from the set {0, 1, 2, 3, 4, 5, 6, 7, 8, 9} one after another without replacement. If p be the probability that the smallest of these three numbers is less than 4, then 18p is equal to _____.

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30. Numerical value · 4 marks

If the mean of the numbers 3, 4, a, b, 10 is 6 and their standard deviation is $\sqrt{6.8}$, then a^3+b^3 is equal to _____.

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31. 4 marks

Match **List - I** with **List - II** :

	List - I		List - II
(a)	Jaisalmer	(i)	Pink city
(b)	Jodhpur	(ii)	Golden city
(c)	Jaipur	(iii)	Lake city
(d)	Udaipur	(iv)	Blue city

(1) (a)-(iv), (b)-(ii), (c)-(iii), (d)-(i)

(2) (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)

(3) (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)

(4) (a)-(ii), (b)-(iv), (c)-(iii), (d)-(i)

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32. 4 marks

Match **List - I** with **List - II** :

	List - I		List - II
(a)	Jod Gumbaz	(i)	Mahabalipuram
(b)	Cave temples	(ii)	Madhurai
(c)	Rangnatha temple	(iii)	Bijapur
(d)	Minakshi temple	(iv)	Srirangam

(1) (a)-(iii), (b)-(ii), (c)-(iv), (d)-(i)

(2) (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)

(3) (a)-(iv), (b)-(i), (c)-(iii), (d)-(ii)

(4) (a)-(i), (b)-(iv), (c)-(iii), (d)-(ii)

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33. 4 marks

Which is the largest monestry in India ?

(1) Tawang
(2) Leh
(3) Dharamshala
(4) Labrang

34. 4 marks

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

(1) Udaipur
(2) Jodhpur
(3) Bikaner
(4) Jaisalmer

35. 4 marks

'Kyoto protocol' summit was held in which country ?

(1) Japan
(2) Korea
(3) Malyasia
(4) China

36. 4 marks

What was Delhi's old name ?

(1) Old Delhi
(2) Shahjahanpur
(3) Shahpur Jat
(4) Shahajahanabad

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37. 4 marks

Match **List - I** with **List - II** :

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

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

	List - I		**List - II**
(a)	Maheshwar, MP	(i)	Ganga
(b)	Kolhapur, Maharashtra	(ii)	Shipra
(c)	Ujjain, MP	(iii)	Narmada
(d)	Varanasi, UP	(iv)	Panchganga

(1) (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)

(2) (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)

(3) (a)-(iv), (b)-(ii), (c)-(iii), (d)-(i)

(4) (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)

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38. 4 marks

'Rani Ki Vav' is an example of :

(1) Haveli

(2) Stepwell

(3) Temple

(4) Fort

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39. 4 marks

'Al-Khazneh' the treasury is located in :

(1) Jordan

(2) Turkey

(3) UAE

(4) Saudi-Arabia

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40. 4 marks

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

(1) New Delhi

(2) Lucknow

(3) Mumbai

(4) Varanasi

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41. 4 marks

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

(1) Jantar Mantar at Ujjain.

(2) Jantar Mantar at Mathura.

(3) Jantar Mantar at Varanasi.

(4) Jantar Mantar at Delhi.

---

42. 4 marks

The local term 'Barsati' in a building mean.

(1) Mumty

(2) Balcony

(3) Canopy

(4) Parapet

---

43. 4 marks

Lingraj temple is situated in :

(1) Cuttack

(2) Puri

(3) Bhubaneshwar

(4) Konark

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44. 4 marks

Porcelain is a product made up of :

(1) Steel

(2) Stone

(3) Clay

(4) Timber

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45. 4 marks

Bhagalpur is known for :

(1) Cotton

(2) Silk

(3) Tea

(4) Rice

---

46. 4 marks

Which one of the following terms is used to describe trade between two or more countries ?

(1) Internal trade
(2) External trade
(3) International trade
(4) Local trade

47. 4 marks

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

(1) B.V. Doshi
(2) Joseph Allein Stein
(3) Charles Correa
(4) I.M. Pei

48. 4 marks

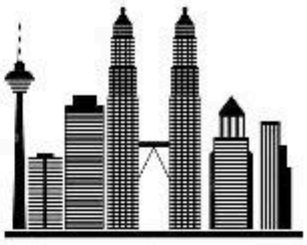


Mirror the words along X-Y axis and choose the correct option amongst the following.

(1) SUCCESS
(2) SUCCESS
(3) SUCCESS
(4) SSECCUS

49. 4 marks

Match **List - I** with **List - II** :

List - I		**List - II**
(a) Dubai	(i)	
(b) London	(ii)	
(c) New York	(iii)	
(d) Kuala Lumpur	(iv)	

Choose **correct** answer.

(1) (a)-(i), (b)-(iii), (c)-(iv), (d)-(ii)

(2) (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)

(3) (a)-(iii), (b)-(ii), (c)-(iv), (d)-(i)

(4) (a)-(ii), (b)-(i), (c)-(iii), (d)-(iv)

50. 4 marks

Match **List - I** with **List - II** :

List - I		**List - II**
(a) Empire state building	(i)	
(b) Opera House	(ii)	
(c) Hagia Sophia	(iii)	
(d) Guggenheim Museum	(iv)	

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

(1) (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)

(2) (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)

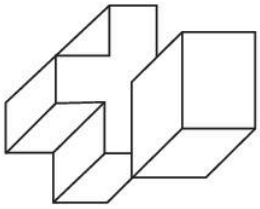
50. (continued) 4 marks

(3) (a)-(i), (b)-(ii), (c)-(iv), (d)-(iii)

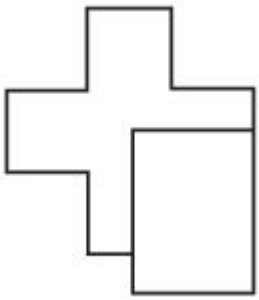
(4) (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)

51. 4 marks

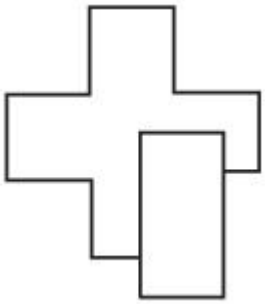
The 3D figure shows the view of an object. Identify the correct top view, amongst the answer figure's.



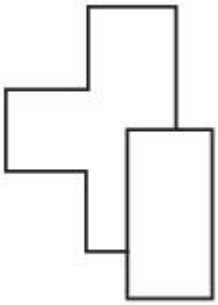
(1)



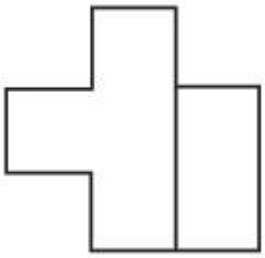
(2)



(3)

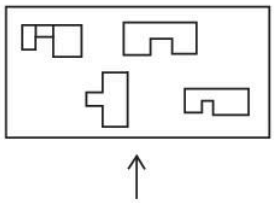


(4)

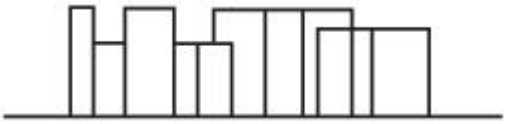


52. 4 marks

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



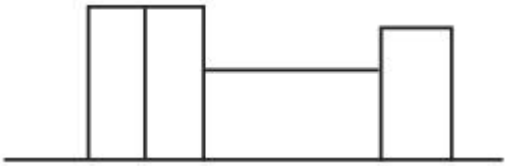
(1)



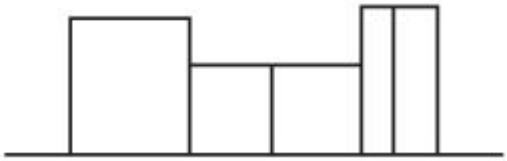
(2)



(3)



(4)



53. 4 marks

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

(1)



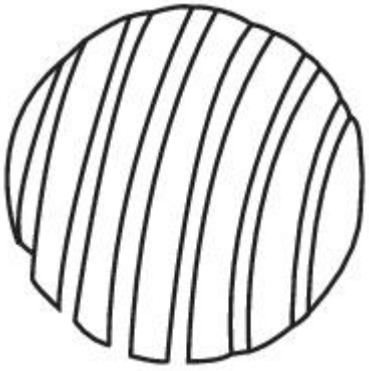
(2)



(3)

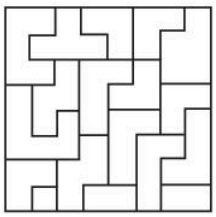


(4)



54. 4 marks

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



(1) 

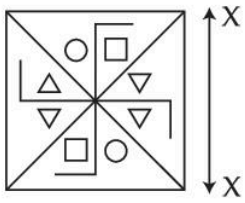
(2) 

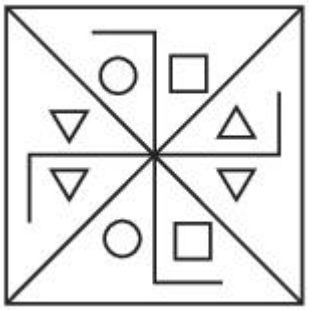
(3) 

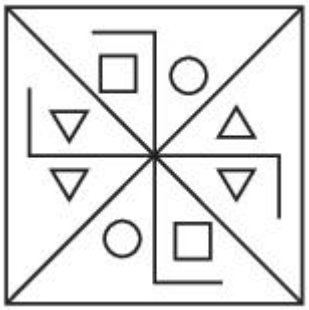
(4) 

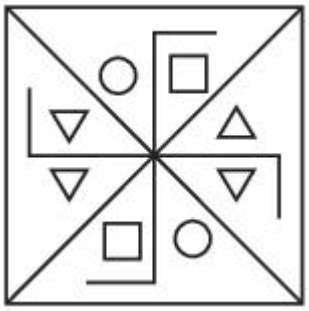
55. 4 marks

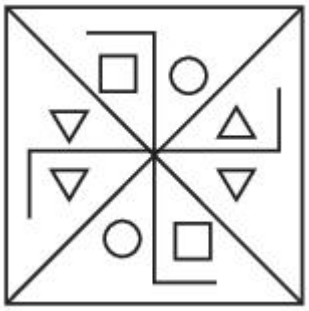
Which of the answer figure is correct mirror image of the problem figure with respect to X-X ?



(1) 

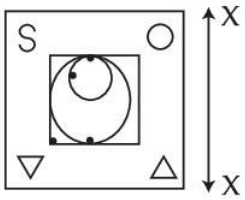
(2) 

(3) 

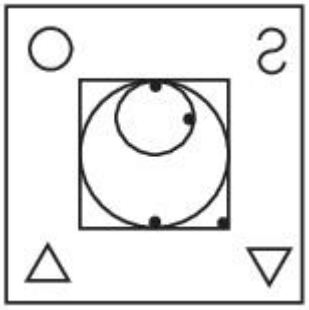
(4) 

56. 4 marks

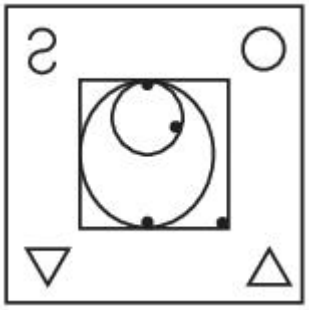
Which one of the answer figure is correct mirror image of problem figure with respect to X-X ?



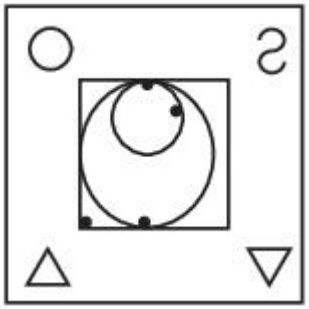
(1)



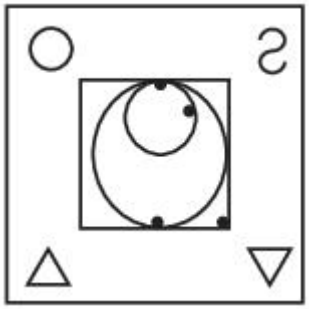
(2)



(3)

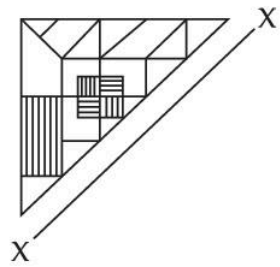


(4)

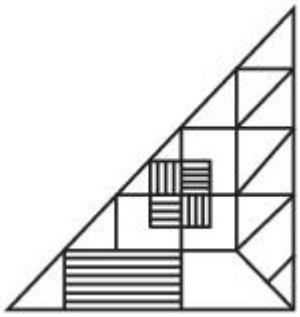


57. 4 marks

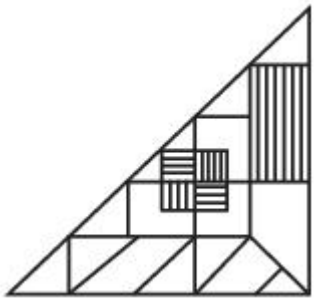
Which one of the answer figure is correct mirror image of problem figure with respect to X-X ?



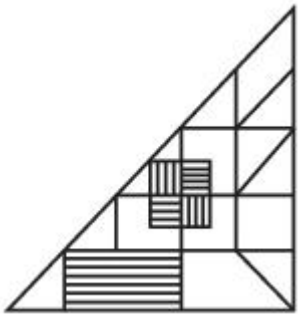
(1)



(2)



(3)

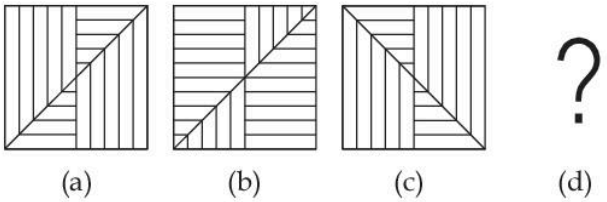


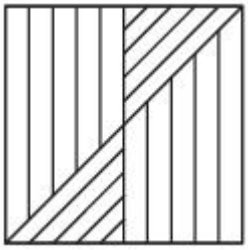
(4)

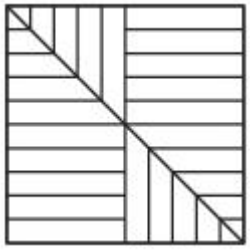


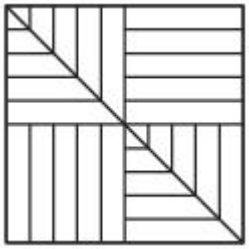
58. 4 marks

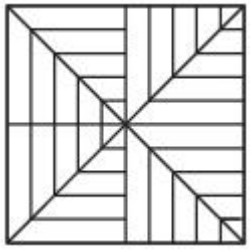
Which one of the answer figure will complete the sequence of the problem figure ? Choose correct one.



(1) 

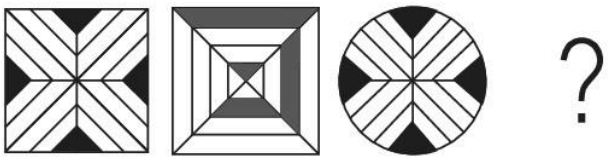
(2) 

(3) 

(4) 

59. 4 marks

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



(a) (b) (c) (d)

(1) 

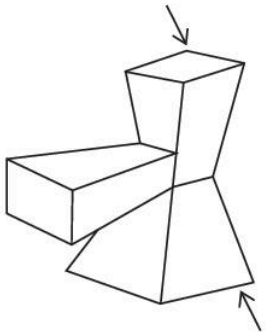
(2) 

(3) 

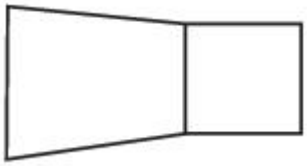
(4) 

60. 4 marks

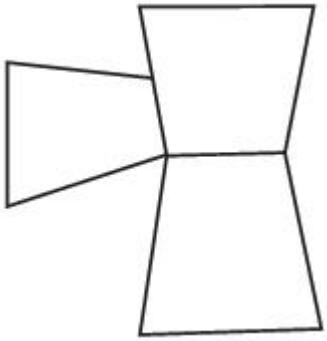
The 3D figure shows the view of an object. Find out the odd shape from the answer figures which is not related to 3D figure.



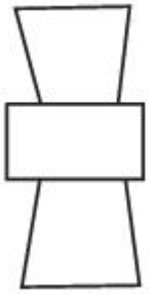
(1)



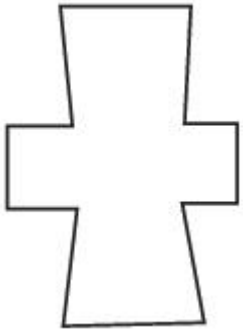
(2)



(3)

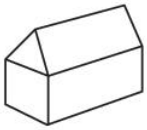


(4)

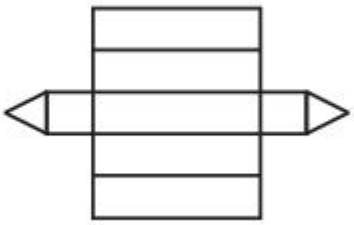


61. 4 marks

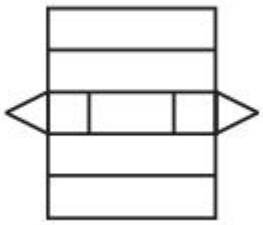
The 3D figure shows the view of an object. Identify the correct view when figure opened up amongst the answer figures.



(1)



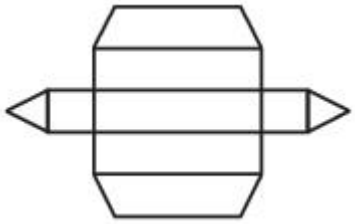
(2)



(3)

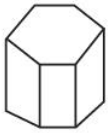


(4)

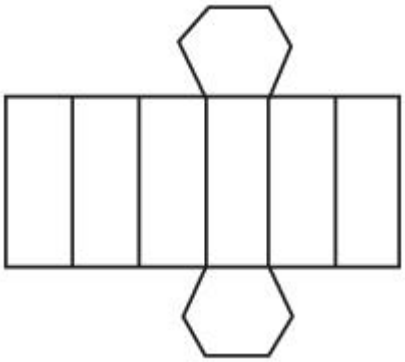


62. 4 marks

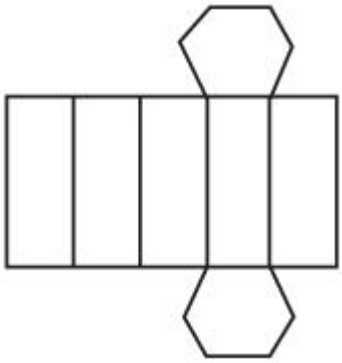
The 3D figure shows the view of an object. Identify the correct view when the figure opened up from amongst the answer figures.



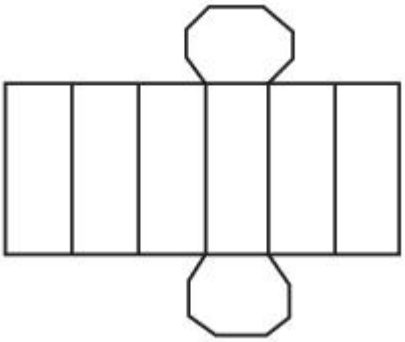
(1)



(2)



(3)

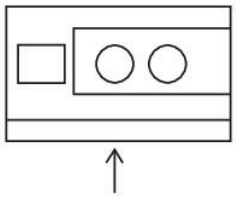


(4)

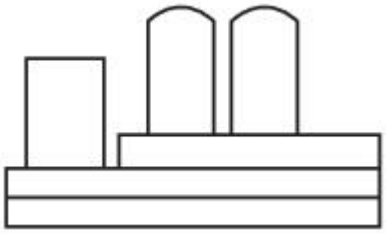


63. 4 marks

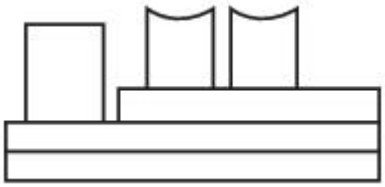
The problem figure shows the top view of an object. Identify the correct elevation amongst the answer figure looking in the direction of the arrow.



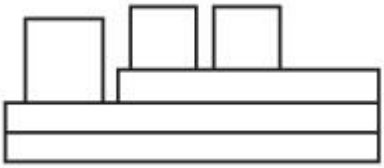
(1)



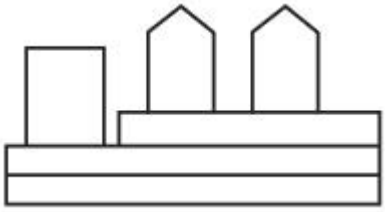
(2)



(3)

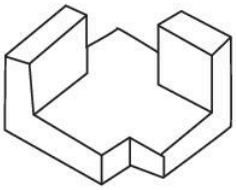


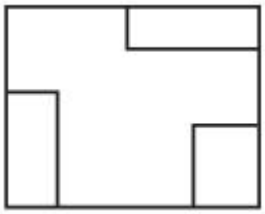
(4)

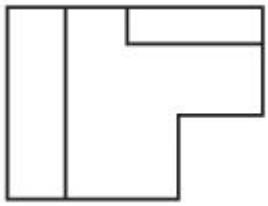


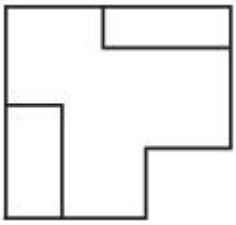
64. 4 marks

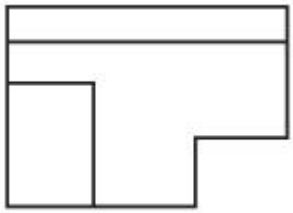
The 3D figure shows the view of an object. Identify the correct top view, from amongst the answer figure.



(1) 

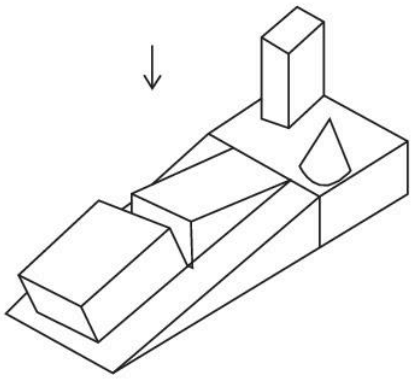
(2) 

(3) 

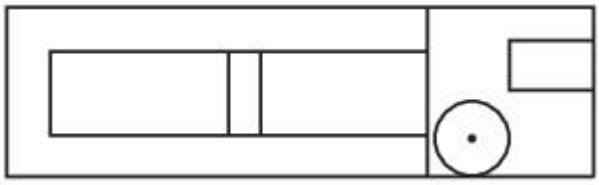
(4) 

65. 4 marks

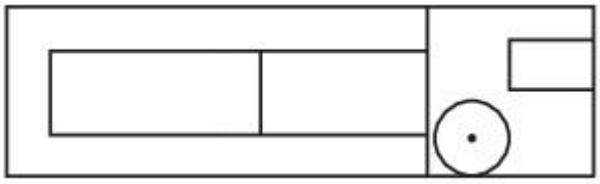
The 3D figure shows the view of an object. Identify the correct view in the direction of the arrow, from the answer figure's.



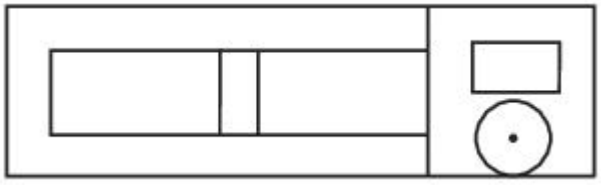
(1)



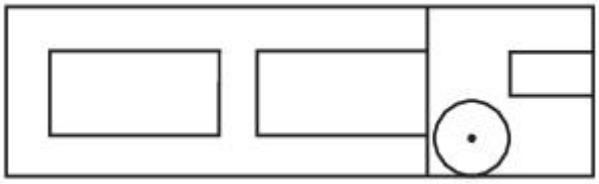
(2)



(3)

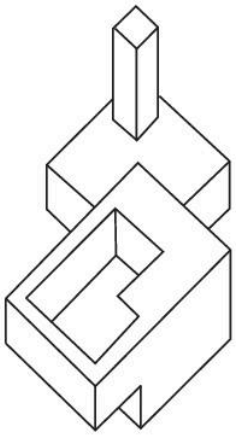


(4)

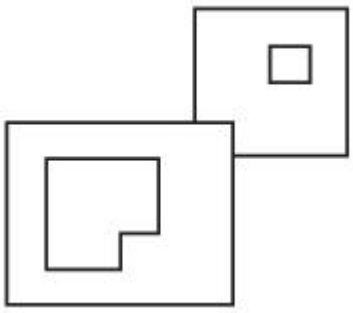


66. 4 marks

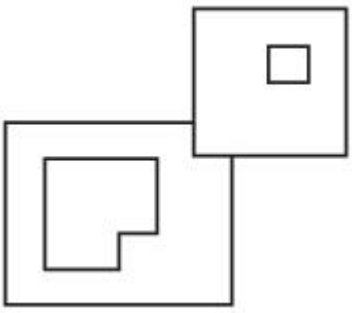
The 3D figure shows the view of an object. Identify the correct top view, amongst the answer figures.



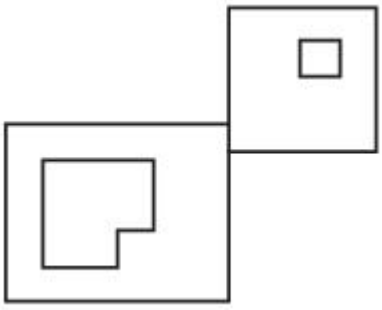
(1)



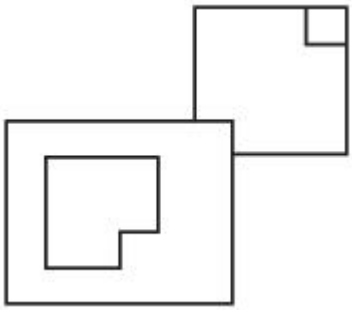
(2)



(3)

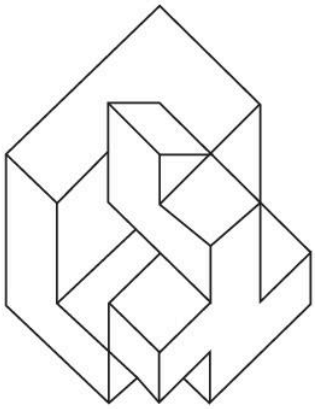


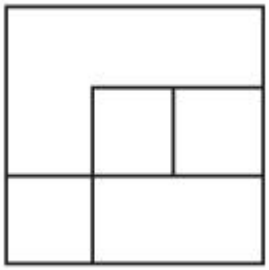
(4)

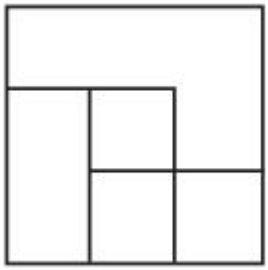


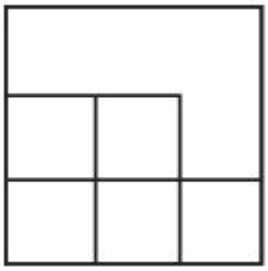
67. 4 marks

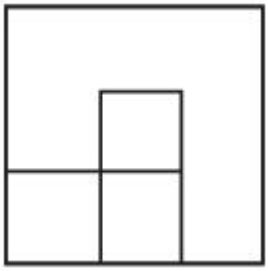
The 3D figure shows the view of an object. Identify the correct top view, amongst the answer figure's.



(1) 

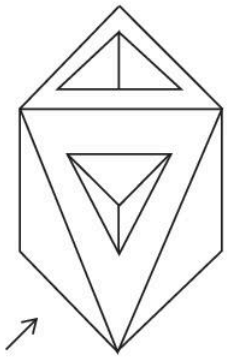
(2) 

(3) 

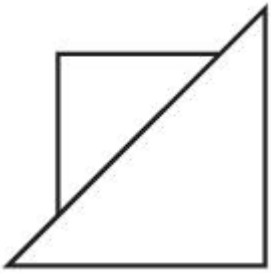
(4) 

68. 4 marks

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



(1) 

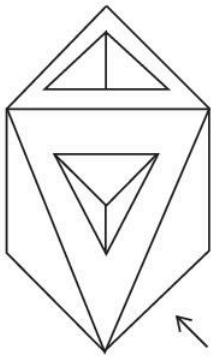
(2) 

(3) 

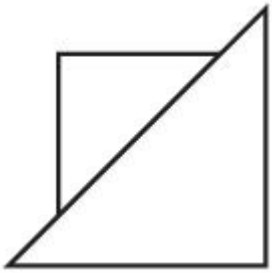
(4) 

69. 4 marks

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



(1) 

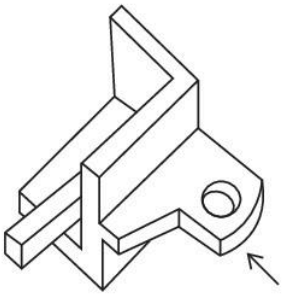
(2) 

(3) 

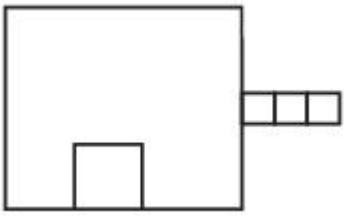
(4) 

70. 4 marks

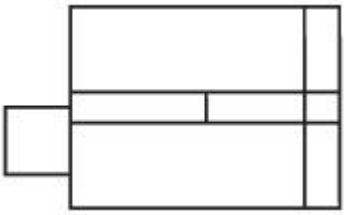
The 3D figure shows the view of an object. Identify the correct view looking in the direction of arrow amongst the answer figures.



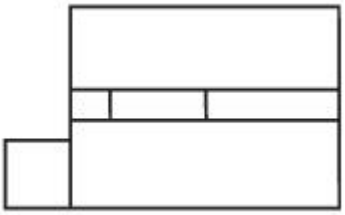
(1)



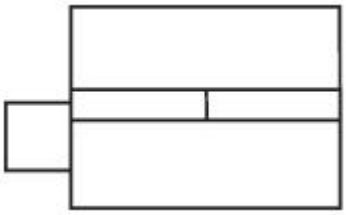
(2)



(3)

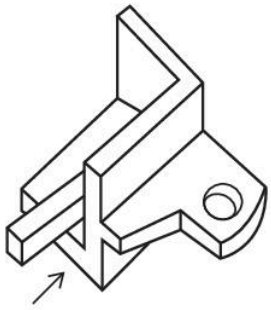


(4)

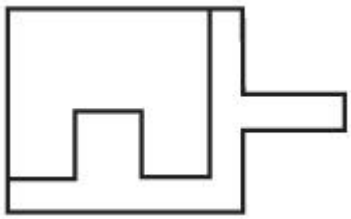


71. 4 marks

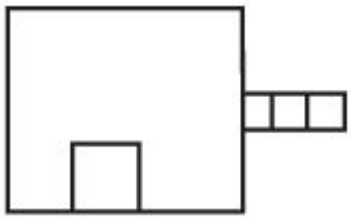
The 3D figure shows the view of an object. Identify the correct view looking in the direction of arrow, from answer figure's.



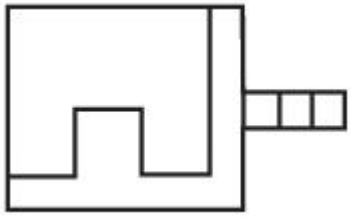
(1)



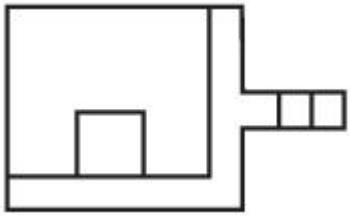
(2)



(3)

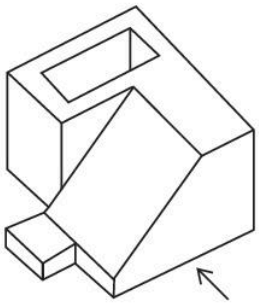


(4)

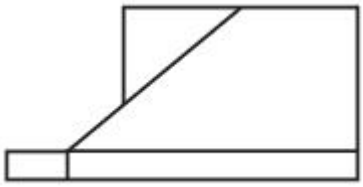


72. 4 marks

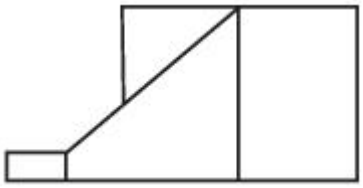
The 3D figure shows view of an object. Identify the correct view looking in the direction of arrow, from the answer figure's.



(1)



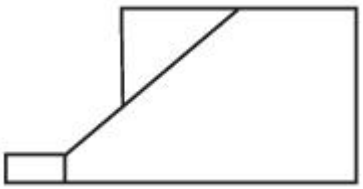
(2)



(3)

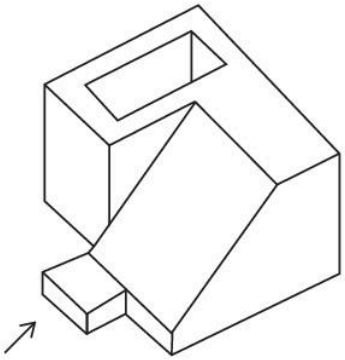


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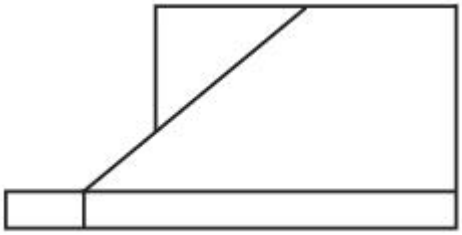


73. 4 marks

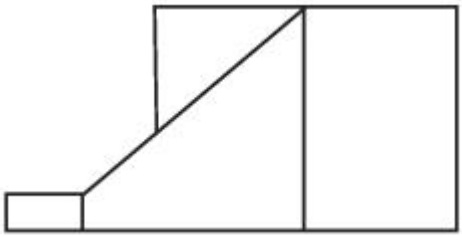
The 3D figure shows view of an object, looking in the direction of arrow, identify the correct elevation from the answer figures.



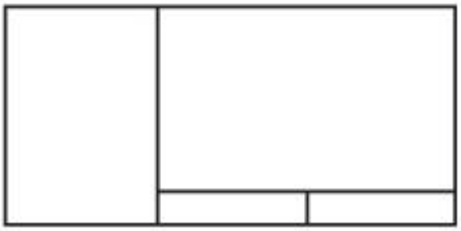
(1)



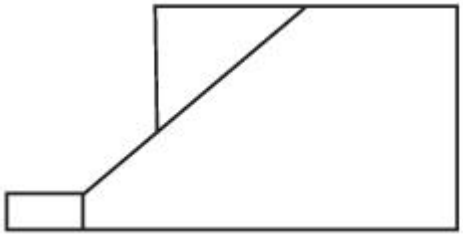
(2)



(3)

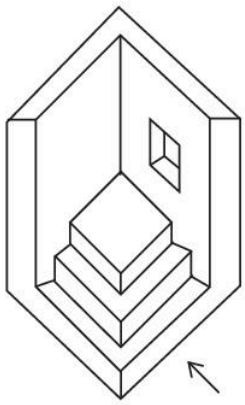


(4)

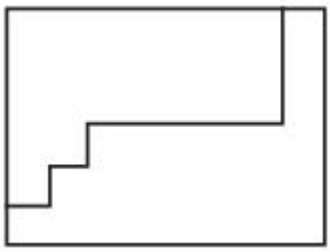


74. 4 marks

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



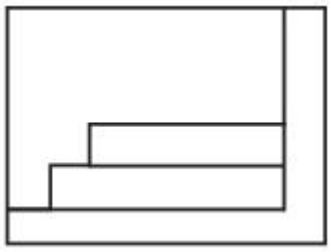
(1)



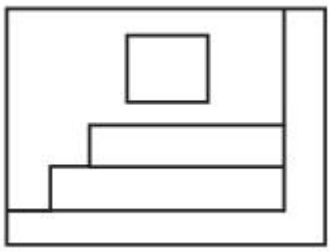
(2)



(3)

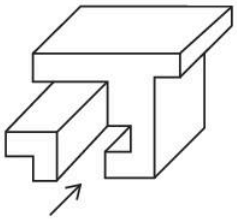


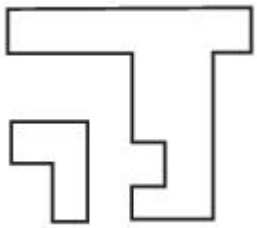
(4)

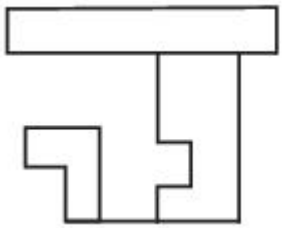


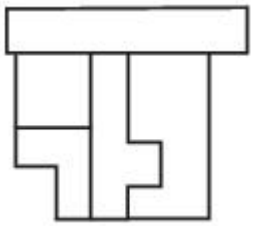
75. 4 marks

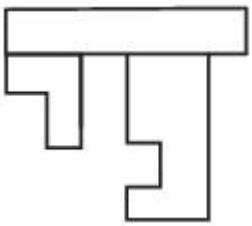
The 3D figures shows the view of an object. Identify the correct view looking in the direction of arrow, from the given answer figures.



(1) 

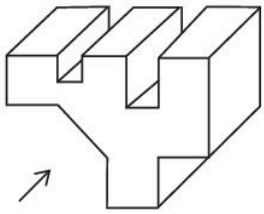
(2) 

(3) 

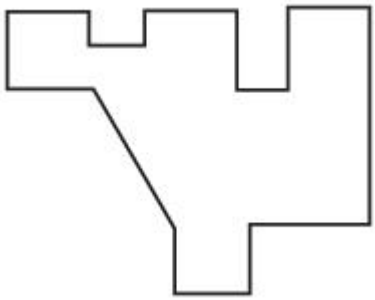
(4) 

76. 4 marks

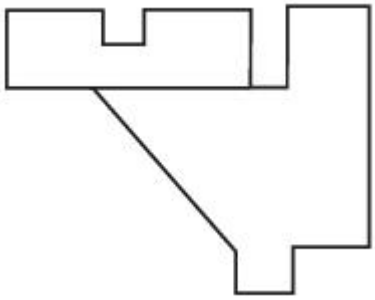
The 3D figure shows the view of an object. Identify the correct view looking in the direction of arrow, from the given answer figure's.



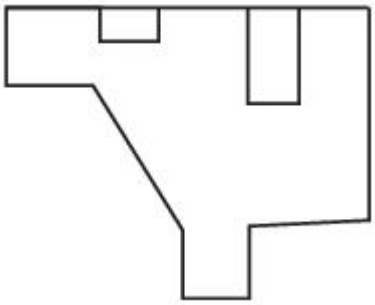
(1)



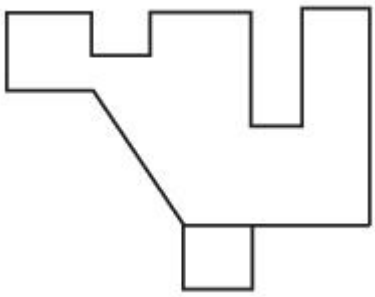
(2)



(3)



(4)



77. 4 marks

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



(1) 

(2) 

(3) 

(4) 

78. 4 marks

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



(1) 

(2) 

(3) 

(4) 

79. 4 marks

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



(1) 

(2) 

(3) 

(4) 

80. 4 marks

Monsoon first reach to which state of India ?

(1) Gujarat

(2) Maharashtra

(3) Kerala

(4) Karnataka

Planning

81. 4 marks

Which is the most populated city in the world ?

(1) Delhi
(2) Shanghai
(3) Tokyo
(4) Sao Paulo

82. 4 marks

Which country organised the 'Earth Summit' in 1992 ?

(1) Sweden
(2) United Kingdom
(3) Brazil
(4) U.S.A.

83. 4 marks

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

(1) Regional Plan, Zonal Plan, Master Plan, Layout Plan.
(2) Regional Plan, Master Plan, Zonal Plan, Layout Plan.
(3) Master Plan, Regional Plan, Layout Plan, Zonal Plan.
(4) Zonal Plan, Layout Plan, Master Plan, Regional Plan.

84. 4 marks

Central government programme known as HRIDAY primarily focuses on :

(1) Hill towns
(2) Heritage cities
(3) Highland resources
(4) Highways, roads and infrastructure

85. 4 marks

Which of these cities are depicted in Charles Dickens's, "A Tale of two cities" ?

(A) London
(B) New York
(C) Venice
(D) Paris
(E) Warsaw

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

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

---

86. 4 marks

Macth **List - I** with **List - II**.

	List - I		**List - II**
(A)	Paris	(I)	Petronas Tower
(B)	New York	(II)	Gardens by the Bay
(C)	Singapore	(III)	Louvre Museum
(D)	Kuala Lumpur	(IV)	Times Square

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

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

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87. 4 marks

Which among the following states in India is more prone to earthquake ?

(1) Kerala
(2) Assam
(3) West Bengal
(4) Madhya Pradesh

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88. 4 marks

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

(1) Black (Regular) soil
(2) Red soil
(3) Alluvial soil
(4) Mountain soil

89. 4 marks

How many towns are there in India based on 2011 census ?

(1) 3000
(2) 4727
(3) 5687
(4) 7935

90. 4 marks

In which city did "Lottery Committee" initiate town planning during 18^{th} century ?

(1) Calcutta
(2) Delhi
(3) Bombay
(4) Amritsar

91. 4 marks

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

(1) 75% workers to be engaged in agricultural pursuits.
(2) 75% of male workers to be engaged in non-agricultural pursuits.
(3) 75% of workers to be engaged in non-agricultural pursuits.
(4) 75% of female workers to be engaged in non-agricultural pursuits.

92. 4 marks

First printing press of Europe was named :

(1) Erasmus Printing Press
(2) The Gutenberg Press
(3) Britannica Press
(4) Vernacular Press

93. 4 marks

Statement I :
The thirteenth Five-Year Plan of India is being prepared for 2020-2025.
Statement II :
Since its inception in 1951, twelve five year plans have been prepared.
In the light of above statements, choose the **most appropriate** answer from the options given below :

(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.

---

94. 4 marks

With how many states does the state of Madhya Pradesh share its border with ?

(1) 5
(2) 7
(3) 6
(4) 4

---

95. 4 marks

Arrange the following ratio scales in the ascending order :
(A) 1 : 4,000
(B) 1 : 5,000
(C) 1 : 30,000
(D) 1 : 250
(E) 1 : 750
Choose the **correct** answer from the options given below :

(1) (A) → (B) → (C) → (D) → (E)
(2) (D) → (E) → (A) → (B) → (C)
(3) (C) → (A) → (B) → (D) → (E)
(4) (C) → (B) → (A) → (E) → (D)

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96. 4 marks

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

(1) Pine diagram

(2) Scatter Plot

(3) Pie chart

(4) Gantt chart

---

97. 4 marks

Assertion A :
The U.S. has hegemony in the world based on its military power.
Reason R :
The U.S. absorbs about 65% of India's total experts in the software sector.
In the light of above statements, choose the **most appropriate** answer from the options given below :

(1) Both **(A)** and **(R)** are correct and **(R)** is the correct explanation of **(A)**.

(2) Both **(A)** and **(R)** are correct but **(R)** is not the correct explanation of **(A)**.

(3) **(A)** is correct but **(R)** is not correct.

(4) **(A)** is not correct but **(R)** is correct.

---

98. 4 marks

Burning wood for household cooking and heating is hazardous to health. Wood smoke contains dangerous toxins that can cause change in human cells. As such there must be some legislation to regulate use of wood-stoves and open-air fires.

Which of the following statements, if true, provide/s support for the above argument ?

(A) Dangerous toxins is higher in vehicle exhaust than in wood smoke.

(B) Smoke produced by coal-burning stoves is more toxic than wood-burning stoves.

(C) In areas where the legislation is to be implemented, the concentration of smoke results in poor air-quality.

(D) No significant beneficial effect on air quality by banning of wood for cooking.

(E) In areas where the legislation is to be implemented, wood is used by more than 50% households.

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

(1) (C) and (E) only

(2) (C) only

(3) (B) only

(4) (A) and (B) only

99. 4 marks

Past weather report for city X reveals that in the month of August, whenever the temperature was 38°C or above, the humidity level was 85% or higher. From this statement it can be concluded that the report which is not accurate for city X, for the month of August is :

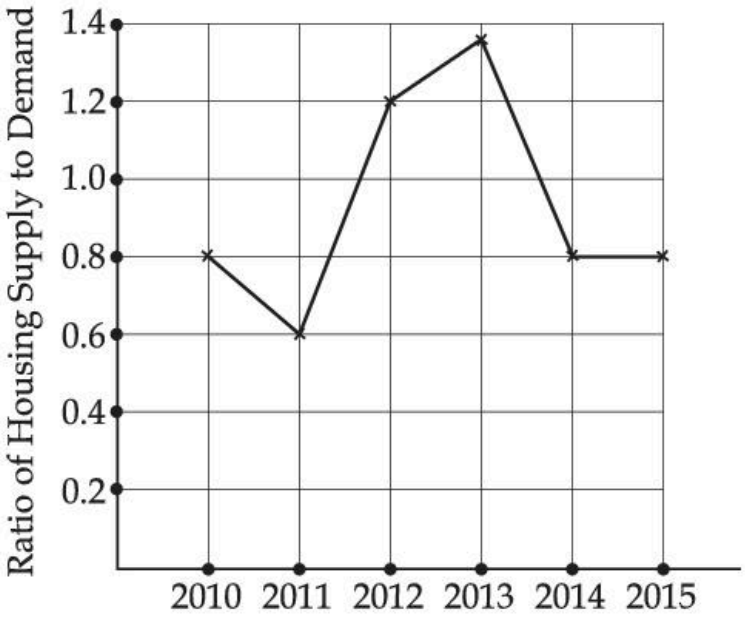
(1) 37°C, 82%

(2) 38°C, 84%

(3) 39°C, 85%

(4) 36°C, 80%

100. 4 marks



The above graph gives the ratio of housing supply to housing demand.
How many years was the demand for housing more than its supply ?

(1) 4 years

(2) 2 years

(3) 1 year

(4) 5 years

101. 4 marks

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

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

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

(1) Delhi

(2) Kolkatta

(3) Greater Mumbai

(4) Hyderabad

102. 4 marks

Which of the following is **not** the correct inference from the table ?

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

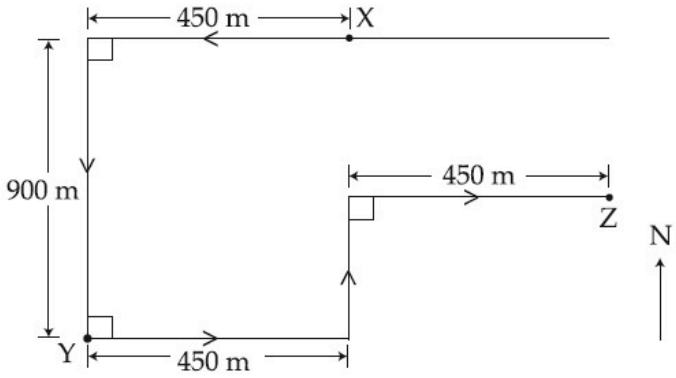
(1) Population growth rate was the highest for Delhi between 1991-2001.

(2) Total population of all cities in 2011 has doubled from total population in 1991.

(3) Population of Greater Mumbai is almost half of the total population of all cities in 2011.

(4) Kolkatta is growing at the slowest rate amongst all four cities.

103. 4 marks



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

Which of the following statements holds true ?

(1) John's bank is located west-south-west of his home.

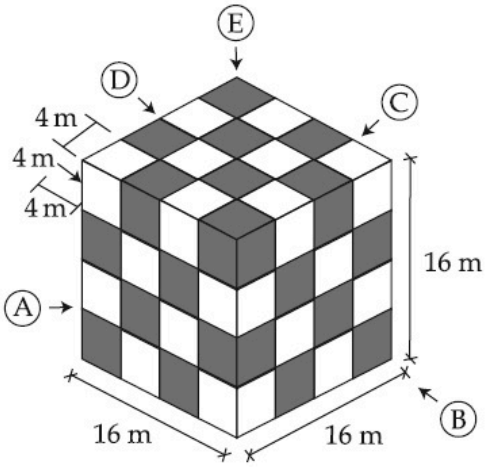
(2) John's bank is located north-east of his home.

(3) John's home is south-east of his office.

(4) John's home is north-west of his office.

104. 4 marks

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



(1) 2048 cu.m.

(2) 1536 cu.m.

(3) 1664 cu.m.

(4) 4028 cu.m.

105. 4 marks

In the tribal arts of India, the traditional tribal Bastar art is famous around all over the world. This art is practiced by tribal of Bastar region of India and is known throughout the world for their unique art works. The tribal communities of Bastar have been protecting this rare art from generation to generation, but in absence of publicity it is restricted to weekly 'haat' and markets. This art is made by conventional tools rather than using the modern excellent machines. Bastar art can be divided mainly into wood work, bamboo art, soil art and metal arts.

Wood art works are mainly used in wooden material to make Bastar culture, festivals, creatures of gods, statues of gods and goddesses and decorations. Bamboo art is made with bamboo sheets, chairs, living room, table, baskets, mats and home furnishings are made. In soil art, the statues of goddesses, decorative utensils, vases, pots and household furnishings are made. In the metal arts, artifacts of copper and tin mixed metal are made, mainly in which statues of goddesses, idols of worship, idols of tribal culture and home furnishings are made.

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

(1) Bastar art is a traditional art of Bihar.

(2) Bastar statues are widely worshipped in Bastar region.

(3) Bastar art is machine made and rarely done through conventional tools.

(4) Bastar art is available in metal, wood, bamboo and soil.