National Testing Agency

Question Paper Name :	JEE Main 2020 Paper 2B (B.Planning) Sep 1 Shift 2
Subject Name :	Paper 2B (B.Planning)
Duration :	180
Total Marks :	400

Paper 2B (B.Planning)

Mathematics

Section Number :	1
Number of Questions :	25
Number of Questions to be attempted :	25
Section Marks :	100

Question Number : 1 Question Id : 4050369305 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Let $A = \{1, 2, 3\}$. Define a relation R on A as :

$aRb \Leftrightarrow |a^2 - b^2| \leq 5$.

Then which of the following is not true ?

Options :

40503633806. $R^{-1} = R$, where R^{-1} is the inverse of R.

40503633807. Range of R is A.

40503633808. R is reflexive and symmetric.

40503633809. R is symmetric and transitive.

Question Number : 2 Question Id : 4050369306 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

The locus of the point

$z = x + iy$ $(x, y \in \mathbf{R}, i = \sqrt{-1})$ satisfying

$\arg\left(\frac{z-3}{z+3}\right) = \frac{\pi}{3}$, is :

Options :

40503633810. a circle with radius $= 2\sqrt{3}$

40503633811. a circle with centre at $(\sqrt{3}, 0)$

40503633812. a circle with centre at $(0, 2\sqrt{3})$ and radius 3

40503633813. an ellipse with length of its minor axis $= 3$

Question Number : 3 Question Id : 4050369307 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

If both the roots of the equation, $x^2-2ax+a^2-1=0\,(a\in \mathbf{R})$ lie in the interval $(-2, 2)$, then the equation, $x^2-(a^2+1)x-(a^2+2)=0$ has

Options :

40503633814. both roots in $(-3, 0)$

40503633815. one root in $(0, 2)$ and another root in $(-2, 0)$

40503633816. one root in $[2, 3)$ and another root in $(-2, 0)$

40503633817. one root in $(-3, -2)$ and another root in $(0, 2]$

Question Number : 4 Question Id : 4050369308 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

If the system of equations

$$2x+y+pz=-1$$
$$3x-2y+z=q$$
$$5x-8y+9z=5$$

has more than one solution, then $q-p$ is equal to :

Options :

40503633818. 2

40503633819. -2

40503633820. 4

40503633821. -4

Question Number : 5 Question Id : 4050369309 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

All the words (with or without meaning) formed using all the five letters of the word GOING are arranged as in dictionary. Then the word OGGIN occurs at the place which is :

Options :

40503633822. $(48)^{th}$

40503633823. $(49)^{th}$

40503633824. $(50)^{th}$

40503633825. $(51)^{th}$

Question Number : 6 Question Id : 4050369310 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

The sum

$$-\frac{2}{3}+\frac{2}{9^2}+\frac{10}{9^3}+\frac{18}{9^4}+\frac{26}{9^5}+\ldots\ldots \text{upto}$$

infinity, is equal to :

Options :

40503633826. $-\frac{5}{8}$

40503633827. $\frac{17}{24}$

40503633828. $-\frac{11}{24}$

40503633829. $\frac{5}{8}$

Question Number : 7 Question Id : 4050369311 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Let r and s be respectively the remainders when $(12)^{23}$ and $(23)^{12}$ are divided by 5, then r + s is equal to :

Options :

40503633830. 5

40503633831. 4

40503633832. 3

40503633833. 2

Question Number : 8 Question Id : 4050369312 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Let f be a differentiable function satisfying $f(x+y)=f(x)+f(y)-xy$ for all $x, y \in \mathbf{R}$. If $\lim\limits_{h\to 0}\dfrac{f(h)}{h}=3$, then $\sum\limits_{n=1}^{10} f(n)$ is equal to :

Options :

40503633834. $-\dfrac{55}{2}$

40503633835. $\dfrac{275}{2}$

40503633836. $-\dfrac{55}{4}$

40503633837. $\dfrac{225}{4}$

Question Number : 9 Question Id : 4050369313 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

For non-zero real numbers a, b, if $y(x)=\dfrac{a+bx^{3/2}}{x^{5/4}}$, $x>0$ and $y''(5)=0$, then the ratio a : b is :

Options :

40503633838. $\sqrt{5}:3$

40503633839. $3:\sqrt{5}$

40503633840. $\sqrt{5}:\sqrt{3}$

40503633841. $3:1$

Question Number : 10 Question Id : 4050369314 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

The function $f(x)=\sin 2x+2\cos x$, $x\in\left(-\frac{3\pi}{4},\frac{3\pi}{4}\right)$ has :

Options :

40503633842. no critical point.

40503633843. a point of local maxima and a point of local minima.

40503633844. a point of local maxima and a point of inflection.

40503633845. a point of local minima and a point of inflection.

Question Number : 11 Question Id : 4050369315 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

The integral $\int\frac{\cos^5\theta}{\sin\theta(4-3\sin^2 2\theta)}\,d\theta$ is equal to :

(where C is a constant of integration)

Options :

40503633846. $\frac{1}{5}\log_e\left|\frac{\cos^5\theta}{\sin^5\theta+\cos^5\theta}\right|+C$

40503633847. $\frac{1}{24}\log_e\left(\frac{\sin^6\theta}{\sin^6\theta+\cos^6\theta}\right)+C$

40503633848. $\frac{1}{20}\log_e\left|\frac{\sin^5\theta}{\sin^5\theta+\cos^5\theta}\right|+C$

40503633849. $\frac{1}{6}\log_e\left(\frac{\cos^6\theta}{\sin^6\theta+\cos^6\theta}\right)+C$

Question Number : 12 Question Id : 4050369316 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

The area (in sq. units) of the region bounded by the parabola $x=2y^2$ and the line $x+y=1$ is :

Options :

40503633850. $\frac{11}{12}$

40503633851. $\frac{13}{24}$

40503633852. $\frac{9}{8}$

40503633853. $\frac{5}{4}$

Question Number : 13 Question Id : 4050369317 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Let $y = y(x)$ be the solution of the differential equation $x \log_e x \frac{dy}{dx} + 2y = 2x\ (x > 1)$. If $\lim_{x \to 1+} y(x) = 1$, then $y(e^2)$ is equal to :

Options :

40503633854. $\frac{e^2 - 1}{2}$

40503633855. $\frac{e^2 + 1}{2}$

40503633856. $e^2 - 1$

40503633857. $e^2 + 1$

Question Number : 14 Question Id : 4050369318 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

If (x_i, y_i), $i = 1, 2, 3$ are the vertices of an equilateral triangle such that $(x_1 + 3)^2 + (y_1 - 4)^2 = (x_2 + 3)^2 + (y_2 - 4)^2 = (x_3 + 3)^2 + (y_3 - 4)^2$, then the value of $\frac{y_1 + y_2 + y_3}{x_1 + x_2 + x_3}$ is :

Options :

40503633858. $\frac{4}{3}$

40503633859. $-\frac{4}{3}$

40503633860. $\frac{3}{4}$

40503633861. $-\frac{3}{4}$

Question Number : 15 Question Id : 4050369319 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

If tangent at $\left(\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}\right)$ to the circle $x^2+y^2=1$ is also a tangent to the circle $(x-a)^2+(y-b)^2=1$, then the ordered pair (a, b) can be :

Options :

40503633862. $\left(-2, \sqrt{2}\right)$

40503633863. $\left(-\sqrt{2}, 2\sqrt{2}\right)$

40503633864. $\left(2, -2\sqrt{2}\right)$

40503633865. $\left(-\sqrt{2}, \sqrt{2}\right)$

Question Number : 16 Question Id : 4050369320 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

The foci of a hyperbola coincide with the foci of the ellipse, $\frac{x^2}{16}+\frac{y^2}{9}=1$. If the eccentricity of the hyperbola is 4, then its equation is :

Options :

40503633866. $\frac{x^2}{7}-\frac{4y^2}{105}=\frac{1}{4}$

40503633867. $\frac{x^2}{7}-\frac{y^2}{105}=\frac{1}{16}$

40503633868. $\frac{x^2}{20} - \frac{y^2}{75} = \frac{1}{16}$

40503633869. $\frac{x^2}{5} - \frac{y^2}{75} = \frac{1}{16}$

Question Number : 17 Question Id : 4050369321 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

If the plane P : $2x - y + 3z + 5 = 0$ is rotated through 90° about its line of intersection with the plane $5x - 4y - 2z + 1 = 0$, then the equation of the plane P in the new position is :

Options :

40503633870. $27x - 24y - 26z + 13 = 0$

40503633871. $27x - 24y - 26z - 13 = 0$

40503633872. $31x + 2y - 20z - 13 = 0$

40503633873. $31x - 25y + 29z + 13 = 0$

Question Number : 18 Question Id : 4050369322 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

The top of two poles, standing 4 m apart on a horizontal plane, are connected by a cable. If the angles of depression from the top of one pole to the bottom of another pole are 30° and 45°, then the minimum length (in m) of the cable is :

Options :

40503633874. $\sqrt{\frac{32\sqrt{3} - 16}{3}}$

40503633875. $\sqrt{\frac{128 - 32\sqrt{3}}{3}}$

40503633876. $\sqrt{\frac{122 - 32\sqrt{3}}{3}}$

40503633877. $\sqrt{\frac{112 - 32\sqrt{3}}{3}}$

Question Number : 19 Question Id : 4050369323 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Let A, B and C be three events such that the probability of occurrence of exactly one of A and B is $\frac{1}{2}$, the probability of occurrence of exactly one of B and C is $\frac{3}{4}$ and the probability of occurrence of exactly one of C and A is $\frac{1}{4}$. If the probability of occurrence of all the three events simultaneously is $\frac{1}{16}$, then the probability that at least one of the three events will occur is :

Options :

40503633878. $\frac{7}{16}$

40503633879. $\frac{13}{16}$

40503633880. $\frac{7}{8}$

40503633881. $\frac{15}{16}$

Question Number : 20 Question Id : 4050369324 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Let

p : I have passed JEE (Main),

q : My JEE (Main) rank is 100, and

r : I will appear in JEE (Advanced)

be three statements with truth values T, F and T respectively. Then which one of the following has the truth value, F ?

Options :

40503633882. $(\sim p \vee \sim q) \wedge r$

40503633883. $(p \wedge \sim q) \vee (\sim r)$

40503633884. $(\sim p \vee q) \wedge (\sim r)$

40503633885. $(\sim p \wedge q) \vee r$

Question Number : 21 Question Id : 4050369325 Question Type : SA Correct Marks : 4 Wrong Marks : 0

Let $B = \begin{bmatrix} 22 & -26 \\ -6 & 10 \end{bmatrix}$ be the matrix obtained by applying the elementary row operations $R_2 \to R_2 - R_1$, $R_1 \to 2R_1$ and $R_1 \to R_1 - 2R_2$ (in this order only) on a matrix A. Then the sum of all entries of A is _____.

Question Number : 22 Question Id : 4050369326 Question Type : SA Correct Marks : 4 Wrong Marks : 0

For $b \in \mathbf{N}$, if the limit of the function

$$f(x) = \begin{cases} [5x - 4], & x < 4 \\ \dfrac{[x + b]}{2}, & x > 4 \end{cases}$$

when $x \to 4$, exists and [t] denotes the greatest integer $\leq t$, then b is equal to _____.

Question Number : 23 Question Id : 4050369327 Question Type : SA Correct Marks : 4 Wrong Marks : 0

If $S = \{x \in [0, 4\pi] : \sin 2x - \cos x = 0\}$ and the sum of the elements of S is $k\pi$, then k is equal to _____.

Question Number : 24 Question Id : 4050369328 Question Type : SA Correct Marks : 4 Wrong Marks : 0

If the mean of the numbers $-7, -5, -2, x, 5$ is -1, then the variance of the numbers $x-3, 4x, x+3$ is _____.

Question Number : 25 Question Id : 4050369329 Question Type : SA Correct Marks : 4 Wrong Marks : 0

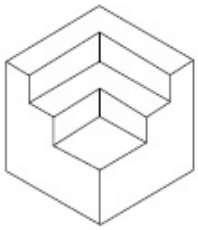
If the equation of a plane P passing through the point $\hat{i} + \hat{j} + \hat{k}$ is $\vec{r} \cdot \left(2\hat{i} - \hat{j} + a\hat{k}\right) = 3$, then the length of the perpendicular from the point $4\hat{i} - \hat{j} + 3\hat{k}$ on the plane P is _____.

Aptitude Test

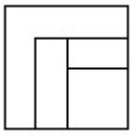
Section Number :	2
Number of Questions :	50
Number of Questions to be attempted :	50
Section Marks :	200

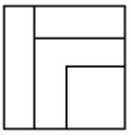
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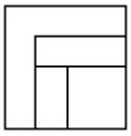
The 3 - D figure shows the view of an object. Identify the correct top view from amongst the answer figures.

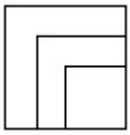


Options :

40503633891. 

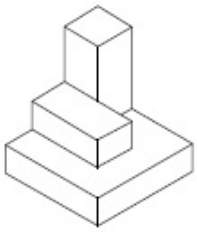
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40503633893. 

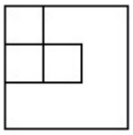
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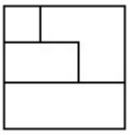
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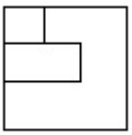
The 3 - D figure shows the view of an object. Identify the correct top view from amongst the answer figures.

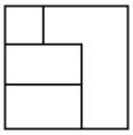


Options :

40503633895. 

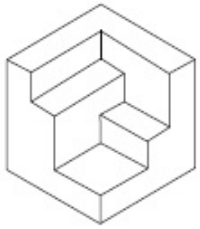
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40503633897. 

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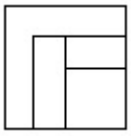
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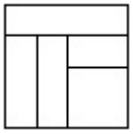
The 3 - D figure shows the view of an object. Identify the correct top view from amongst the answer figures.

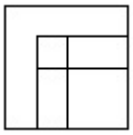


Options :

40503633899. 

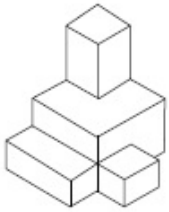
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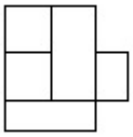
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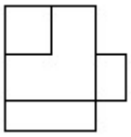
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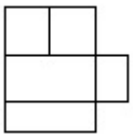
The 3 - D figure shows the view of an object. Identify the correct top view from amongst the answer figures.

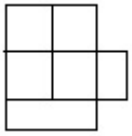


Options :

40503633903. 

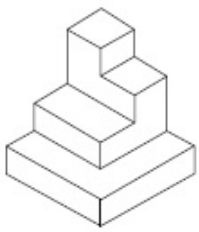
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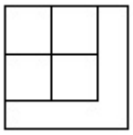
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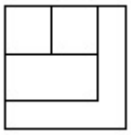
Question Number : 30 Question Id : 4050369334 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

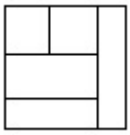
The 3 - D figure shows the view of an object. Identify the correct top view from amongst the answer figures.

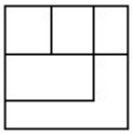


Options :

40503633907. 

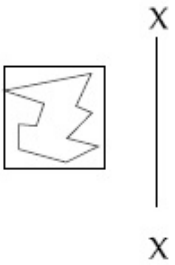
40503633908. 

40503633909. 

40503633910. 

Question Number : 31 Question Id : 4050369335 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

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



Options :

40503633911. 

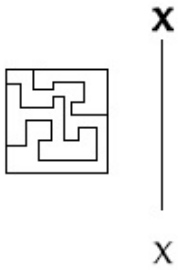
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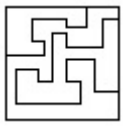
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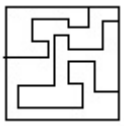
Question Number : 32 Question Id : 4050369336 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

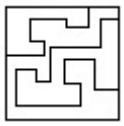
Which one of the answer figures is the correct mirror image of the problem figure with respect to X – X ?

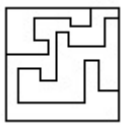


Options :

40503633915. 

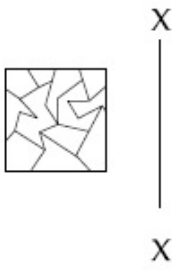
40503633916. 

40503633917. 

40503633918. 

Question Number : 33 Question Id : 4050369337 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

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



Options :

40503633919. 

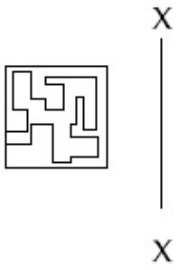
40503633920. 

40503633921. 

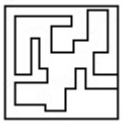
40503633922. 

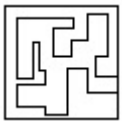
Question Number : 34 Question Id : 4050369338 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

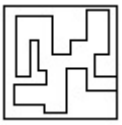
Which one of the answer figures is the correct mirror image of the problem figure with respect to X – X ?

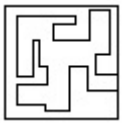


Options :

40503633923. 

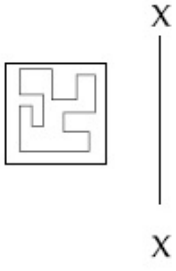
40503633924. 

40503633925. 

40503633926. 

Question Number : 35 Question Id : 4050369339 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

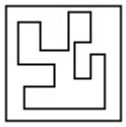
Which one of the answer figures is the correct mirror image of the problem figure with respect to X – X ?

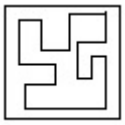


Options :

40503633927. 

40503633928. 

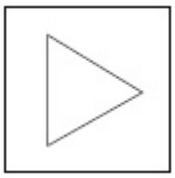
40503633929. 

40503633930. 

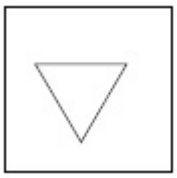
Question Number : 36 Question Id : 4050369340 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Find the odd figure out of the problem figures given below.

Options :

40503633931. 

40503633932. 

40503633933. 

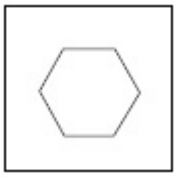
40503633934. 

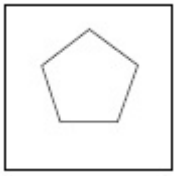
Question Number : 37 Question Id : 4050369341 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

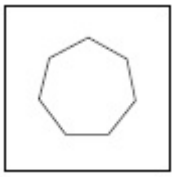
Find the odd figure out of the problem figures given below.

Options :

40503633935. 

40503633936. 

40503633937. 

40503633938. 

Question Number : 38 Question Id : 4050369342 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Find the odd figure out of the problem figures given below.

Options :

40503633939. 

40503633940. 

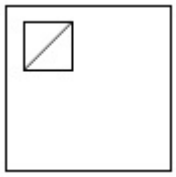
40503633941. 

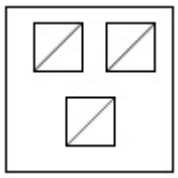
40503633942. 

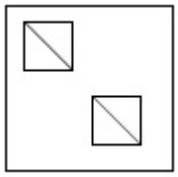
Question Number : 39 Question Id : 4050369343 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

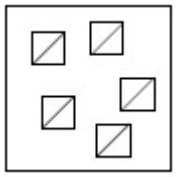
Find the odd figure out of the problem figures given below.

Options :

40503633943. 

40503633944. 

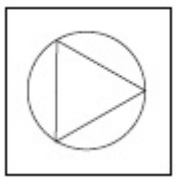
40503633945. 

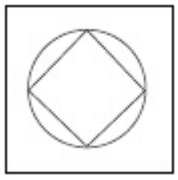
40503633946. 

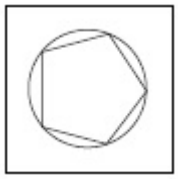
Question Number : 40 Question Id : 4050369344 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

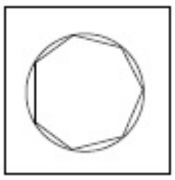
Find the odd figure out of the problem figures given below.

Options :

40503633947. 

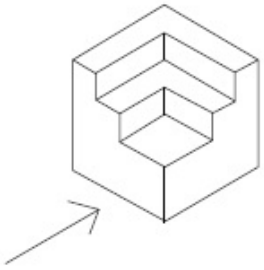
40503633948. 

40503633949. 

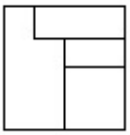
40503633950. 

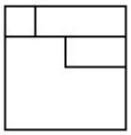
Question Number : 41 Question Id : 4050369345 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

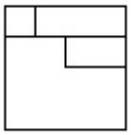
The 3 – D figure shows the view of an object. Identify the correct front view in the direction of the arrow, from amongst the answer figures.

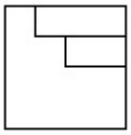


Options :

40503633951. 

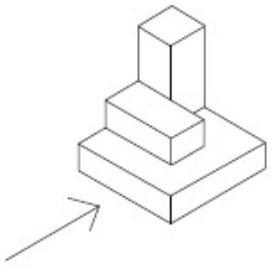
40503633952. 

40503633953. 

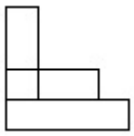
40503633954. 

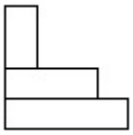
Question Number : 42 Question Id : 4050369346 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

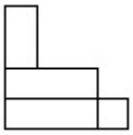
The 3 – D figure shows the view of an object. Identify the correct front view in the direction of the arrow, from amongst the answer figures.

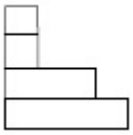


Options :

40503633955. 

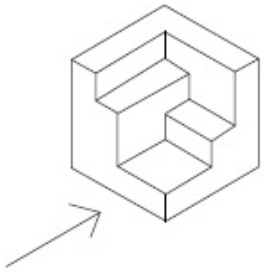
40503633956. 

40503633957. 

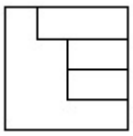
40503633958. 

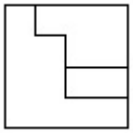
Question Number : 43 Question Id : 4050369347 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

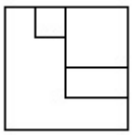
The 3 – D figure shows the view of an object. Identify the correct front view in the direction of the arrow, from amongst the answer figures.

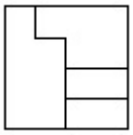


Options :

40503633959. 

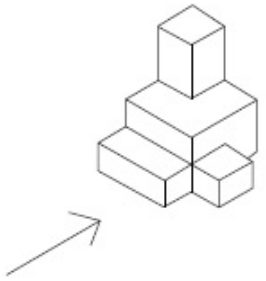
40503633960. 

40503633961. 

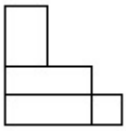
40503633962. 

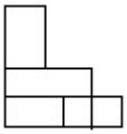
Question Number : 44 Question Id : 4050369348 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

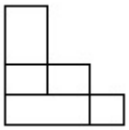
The 3 – D figure shows the view of an object. Identify the correct front view in the direction of the arrow, from amongst the answer figures.

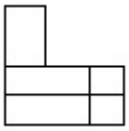


Options :

40503633963. 

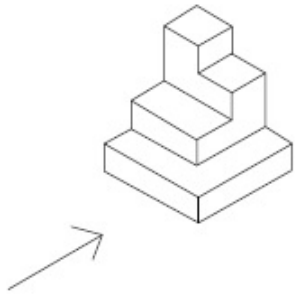
40503633964. 

40503633965. 

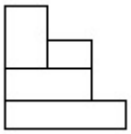
40503633966. 

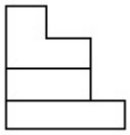
Question Number : 45 Question Id : 4050369349 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

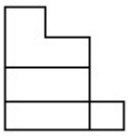
The 3 – D figure shows the view of an object. Identify the correct front view in the direction of the arrow, from amongst the answer figures.

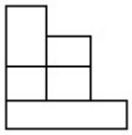


Options :

40503633967. 

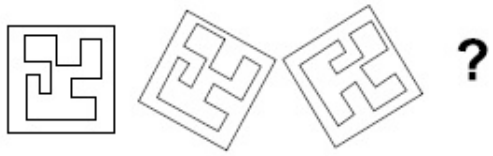
40503633968. 

40503633969. 

40503633970. 

Question Number : 46 Question Id : 4050369350 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

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



Options :

40503633971. 

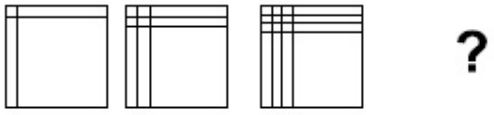
40503633972. 

40503633973. 

40503633974. 

Question Number : 47 Question Id : 4050369351 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

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



Options :

40503633975. 

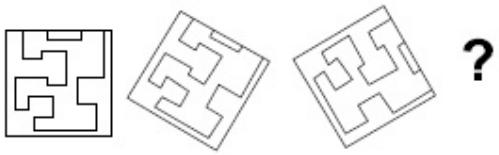
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40503633977. 

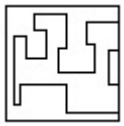
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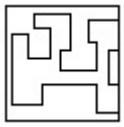
Question Number : 48 Question Id : 4050369352 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

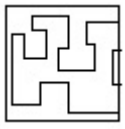
Which one of the answer figure will complete the sequence of the three problem figures ?

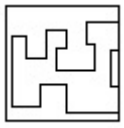


Options :

40503633979. 

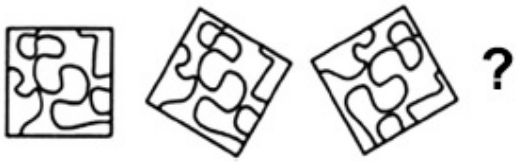
40503633980. 

40503633981. 

40503633982. 

Question Number : 49 Question Id : 4050369353 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

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



Options :

40503633983. 

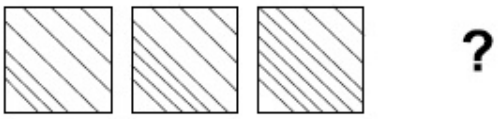
40503633984. 

40503633985. 

40503633986. 

Question Number : 50 Question Id : 4050369354 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

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



Options :

40503633987. 

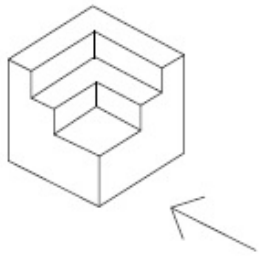
40503633988. 

40503633989. 

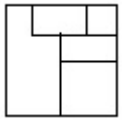
40503633990. 

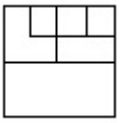
Question Number : 51 Question Id : 4050369355 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

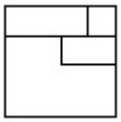
The 3 – D figure shows the view of an object. Identify the correct view in the direction of the arrow, from amongst the answer figures.

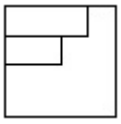


Options :

40503633991. 

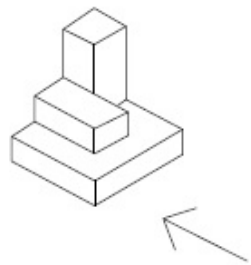
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40503633993. 

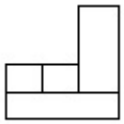
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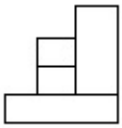
Question Number : 52 Question Id : 4050369356 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

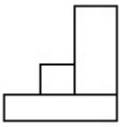
The 3 – D figure shows the view of an object. Identify the correct view in the direction of the arrow, from amongst the answer figures.

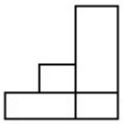


Options :

40503633995. 

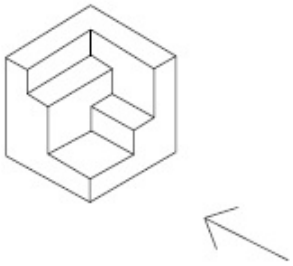
40503633996. 

40503633997. 

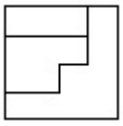
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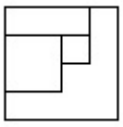
Question Number : 53 Question Id : 4050369357 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

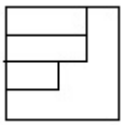
The 3 – D figure shows the view of an object. Identify the correct view in the direction of the arrow, from amongst the answer figures.

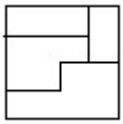


Options :

40503633999. 

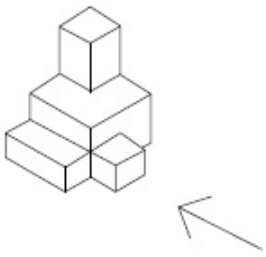
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40503634001. 

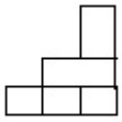
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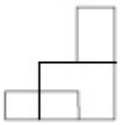
Question Number : 54 Question Id : 4050369358 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

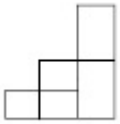
The 3 – D figure shows the view of an object. Identify the correct view in the direction of the arrow, from amongst the answer figures.



Options :

40503634003. 

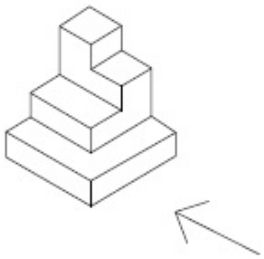
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40503634005. 

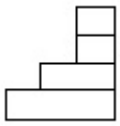
40503634006. 

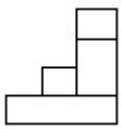
Question Number : 55 Question Id : 4050369359 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

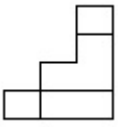
The 3 – D figure shows the view of an object. Identify the correct view in the direction of the arrow, from amongst the answer figures.

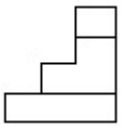


Options :

40503634007. 

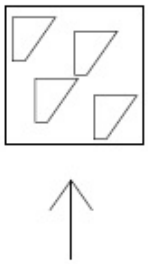
40503634008. 

40503634009. 

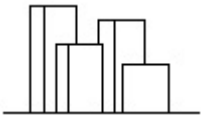
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Question Number : 56 Question Id : 4050369360 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

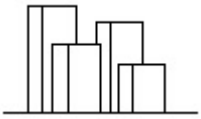
The problem figure shows the top view of objects. Looking in the direction of the arrow, identify the correct elevation, from amongst the answer figures.

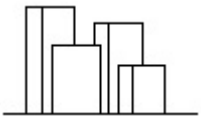


Options :

40503634011. 

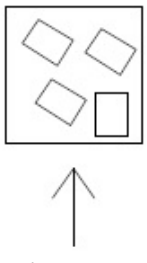
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40503634013. 

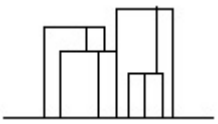
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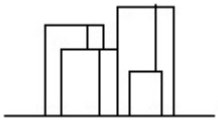
Question Number : 57 Question Id : 4050369361 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

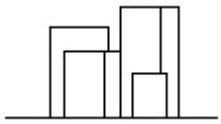
The problem figure shows the top view of objects. Looking in the direction of the arrow, identify the correct elevation, from amongst the answer figures.

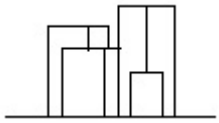


Options :

40503634015. 

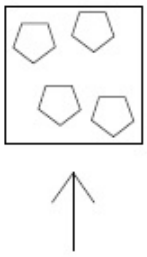
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40503634017. 

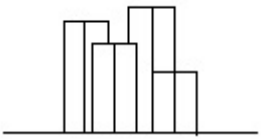
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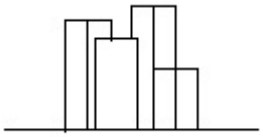
Question Number : 58 Question Id : 4050369362 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

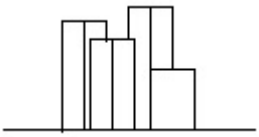
The problem figure shows the top view of objects. Looking in the direction of the arrow, identify the correct elevation, from amongst the answer figures.

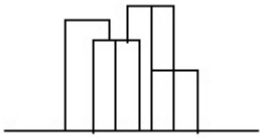


Options :

40503634019. 

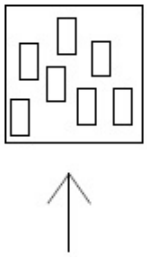
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40503634021. 

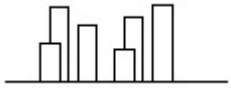
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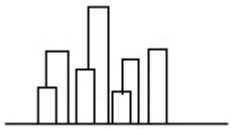
Question Number : 59 Question Id : 4050369363 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

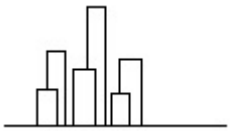
The problem figure shows the top view of objects. Looking in the direction of the arrow, identify the correct elevation, from amongst the answer figures.

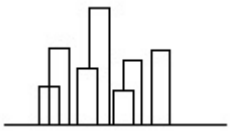


Options :

40503634023. 

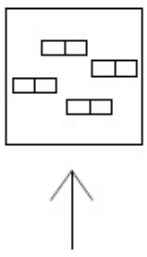
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40503634025. 

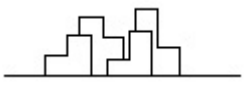
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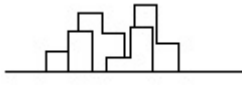
Question Number : 60 Question Id : 4050369364 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

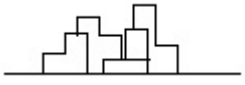
The problem figure shows the top view of objects. Looking in the direction of the arrow, identify the correct elevation, from amongst the answer figures.

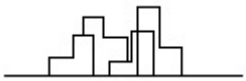


Options :

40503634027. 

40503634028. 

40503634029. 

40503634030. 

Question Number : 61 Question Id : 4050369365 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

The White House is which one of the following ?

Options :

40503634031. Residence of Prime Minister of Germany

40503634032. Residence of Prime Minister of France

40503634033. Residence of Prime Minister of Spain

40503634034. Residence of President of USA

Question Number : 62 Question Id : 4050369366 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

In the Northern Hemisphere the summer sun rises from which one of the following directions ?

Options :

40503634035. North East

40503634036. North West

40503634037. South East

40503634038. South West

Question Number : 63 Question Id : 4050369367 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

In which of the following States is the Golden Temple located ?

Options :

40503634039. Haryana

40503634040. Punjab

40503634041. Assam

40503634042. Nagaland

Question Number : 64 Question Id : 4050369368 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

What is the thickness of a one and a half brick thick wall ?

Options :

40503634043. 9″

40503634044. 12″

40503634045. 18″

40503634046. 13.5″

Question Number : 65 Question Id : 4050369369 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Which one amongst the following supports the masonry above doors and windows ?

Options :

40503634047. Foundation

40503634048. Lintel

40503634049. Slab

40503634050. Wooden frame

Question Number : 66 Question Id : 4050369370 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

The Leaning Tower in Italy is located in which one of the following cities ?

Options :

40503634051. Florence

40503634052. Venice

40503634053. Pisa

40503634054. Rome

Question Number : 67 Question Id : 4050369371 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Which one of the garden of the following is a terraced garden in Srinagar ?

Options :

40503634055. Nishat

40503634056. Vrindaban

40503634057. Buddha

40503634058. Nehru

Question Number : 68 Question Id : 4050369372 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

What amongst the following is the name of the famous museum in Hyderabad ?

Options :

40503634059. Falaknuma

40503634060. Salarjung

40503634061. Gandhi

40503634062. Nizam

Question Number : 69 Question Id : 4050369373 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Which one of the color is made when blue and yellow are mixed ?

Options :

40503634063. Violet

40503634064. Orange

40503634065. Green

40503634066. White

Question Number : 70 Question Id : 4050369374 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Which one of the following color suggests love and romance ?

Options :

40503634067. Blue

40503634068. Green

40503634069. Pink

40503634070. Brown

Question Number : 71 Question Id : 4050369375 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Which one of the following suggests the texture of the skin of the elderly persons ?

Options :

40503634071. Glossy

40503634072. Wrinkled

40503634073. Smooth

40503634074. Soft

Question Number : 72 Question Id : 4050369376 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Which one of the following is fixed to drain water from a sloping roof ?

Options :

40503634075. Ridge

40503634076. Eave

40503634077. J. Bolt

40503634078. Gutter

Question Number : 73 Question Id : 4050369377 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Which one of the following is ideal flooring for a cinema hall ?

Options :

40503634079. Granite

40503634080. Brick

40503634081. Marble

40503634082. Carpet

Question Number : 74 Question Id : 4050369378 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Who among the following is the architect of the Punjab Haryana High Court Building ?

Options :

40503634083. Maxwell Fry

40503634084. Le Corbusier

40503634085. Louis Kahn

40503634086. Geoffrey Bawa

Question Number : 75 Question Id : 4050369379 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Which one among the following is used for water conservation ?

Options :

40503634087. Water drainage

40503634088. Water evaporation

40503634089. Water harvesting

40503634090. Water flowing

Planning

Section Number : 3
Number of Questions : 25
Number of Questions to be attempted : 25
Section Marks : 100

Question Number : 76 Question Id : 4050369380 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Secondary sector of economic activity is associated with :

Options :

40503634091. Agriculture

40503634092. Manufacturing

40503634093. Service

40503634094. Mining

Question Number : 77 Question Id : 4050369381 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Allocation of powers and functions between Union and State governments is given in which schedule of the Constitution of India ?

Options :

40503634095. First Schedule

40503634096. Third Schedule

40503634097. Fifth Schedule

40503634098. Seventh Schedule

Question Number : 78 Question Id : 4050369382 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Which of the following criteria is **not** the basis of classification of natural resources ?

Options :

40503634099. Exhaustibility

40503634100. Ownership

40503634101. Origin

40503634102. Climate

Question Number : 79 Question Id : 4050369383 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Who amongst the following was involved in design of New Delhi ?

Options :

40503634103. Sir Edwin Lutyens

40503634104. Le Corbusier

40503634105. Otto Konigsberger

40503634106. Patrick Geddes

Question Number : 80 Question Id : 4050369384 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Jawaharlal Nehru National Urban Renewal Mission (JNNURM) was launched in :

Options :

40503634107. 1970

40503634108. 1975

40503634109. 2005

40503634110. 2010

Question Number : 81 Question Id : 4050369385 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Which of the following does **not** involve community participation ?

Options :

40503634111. Demarcation of dense forests

40503634112. Urban Basic Services for the poor

40503634113. Joint Forest Management

40503634114. Beej Bachao Andolan

Question Number : 82 Question Id : 4050369386 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Out of Mohenjo-daro, Harappa, Lothal and Dholavira, which of the following cities were laid out on grid pattern ?

Options :

40503634115. Mohenjo-daro and Harappa

40503634116. Mohenjo-daro, Harappa and Dholavira

40503634117. Harappa and Lothal

40503634118. Mohenjo-daro, Harappa, Dholavira and Lothal

Question Number : 83 Question Id : 4050369387 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

What is the full form of IOT ?

Options :

40503634119. International Organisation for Trade

40503634120. Internet of Tweets

40503634121. Interest on Transactions

40503634122. Internet of Things

Question Number : 84 Question Id : 4050369388 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

The Second United Nations Conference on 'Human Settlements Habitat II' was held in :

Options :

40503634123. Vancouver

40503634124. Kyoto

40503634125. Istanbul

40503634126. Quito

Question Number : 85 Question Id : 4050369389 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

The first Sub-urban Railway line in India started its operation in :

Options :

40503634127. 1857

40503634128. 1984

40503634129. 1901

40503634130. 1837

Question Number : 86 Question Id : 4050369390 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Which of the following cities is not planned on a grid pattern ?

Options :

40503634131. Washington DC

40503634132. Amsterdam

40503634133. Barcelona

40503634134. New York

Question Number : 87 Question Id : 4050369391 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

The largest source of water pollution in India is due to :

Options :

40503634135. Small Scale Industries

40503634136. Agricultural Run-off

40503634137. Untreated Sewage

40503634138. Large Scale Industries

Question Number : 88 Question Id : 4050369392 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

What is indicated by a contour line on a topographical map ?

Options :

40503634139. Height

40503634140. Administrative Boundary

40503634141. Vegetation

40503634142. Water Body

Question Number : 89 Question Id : 4050369393 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

The ratio that shows a relationship between the distance on a map and the actual distance on ground is known as :

Options :

40503634143. Direction

40503634144. Key map

40503634145. Scale

40503634146. Isotherm

Question Number : 90 Question Id : 4050369394 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Find the correct match :

(P)	Dhanbad	(I)	Textile
(Q)	Kandla	(II)	Mining
(R)	Bokaro	(III)	Port
(S)	Surat	(IV)	Steel Industry

Options :

40503634147. (P)-(II), (Q)-(I), (R)-(III), (S)-(IV)

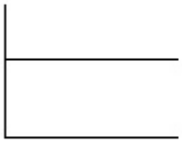
40503634148. (P)-(I), (Q)-(III), (R)-(II), (S)-(IV)

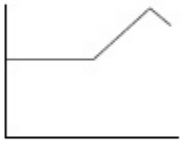
40503634149. (P)-(III), (Q)-(II), (R)-(IV), (S)-(I)

40503634150. (P)-(II), (Q)-(III), (R)-(IV), (S)-(I)

Question Number : 91 Question Id : 4050369395 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Select the indicative graph that best fits the **Statement** : "Car prices rose steadily, dropped a little and are now holding steady".

(A) 

(B) 

(C) 

(D) 

Options :

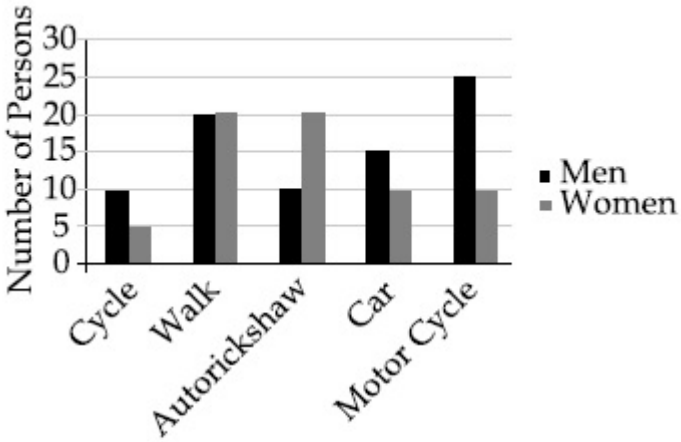
40503634151. (A)

40503634152. (B)

40503634153. (D)

40503634154. Both (C) and (D)

Question Number : 92 Question Id : 4050369396 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1



The diagram above shows the number of men and women using different modes of transport to commute to their work place.

Which of these statements is the **correct** answer ?

Options :

40503634155. 50% of all those who cycle to their work places are women

40503634156. More men compared to women use auto-rickshaw for commuting to work place

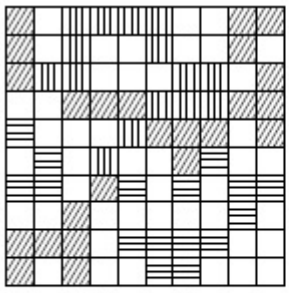
40503634157. More women compared to men cycle to their work place

40503634158. The highest share of persons walk to their work place

Question Number : 93 Question Id : 4050369397 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

One site is divided into 10×10 units as shown in the figure. It has following classification of land area.

(A) Waste land
(B) Forest land
(C) Agriculture land
(D) Unused land



Which of the following classification has the highest amount of land ?

Options :

40503634159. Waste land

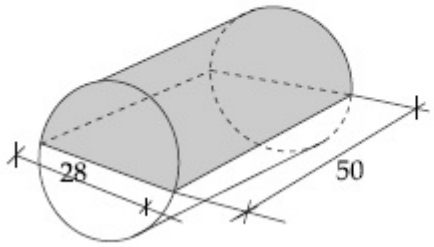
40503634160. Forest land

40503634161. Agriculture land

40503634162. Unused land

Question Number : 94 Question Id : 4050369398 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

In the given figure the volume of the shaded portion is :



Options :

40503634163. 46,200

40503634164. 30,800

40503634165. 15,400

40503634166. 7,700

Question Number : 95 Question Id : 4050369399 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Following table gives the number of families according to family size. What is the average family size ? (Rounded off to one decimal)

S.No.	Family size (persons)	No. of families
1.	3	300
2.	4	200
3.	5	400
4.	6	400

Options :

40503634167. 4.5

40503634168. 4.7

40503634169. 4.9

40503634170. 5.0

Question Number : 96 Question Id : 4050369400 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Read the given passage and answer the question.

The United Nations (UN) has warned that the global consumption of natural resources could triple to 140 billion tons a year by 2050 unless consumer nations take drastic steps. The UN environment panel called on governments to 'decouple' economic growth from the rapid rate of natural resource consumption. It said the world is already running out of some essential materials including oil, copper and gold, which in turn, will need rising volumes of fuel and water. Decoupling involves transition to a low-carbon, resource efficient green economy that stimulates growth in a way to keep humanity's footprint within planetary.

The term 'decoupling' here would entail :

Options :

40503634171. Birth control measures to reduce resource consumption

40503634172. Production of cheap materials

40503634173. Talk less and work more

40503634174. Promoting growth that stresses on reducing the rate of consumption of natural resources

Question Number : 97 Question Id : 4050369401 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Read the given passage and answer the question.

The United Nations (UN) has warned that the global consumption of natural resources could triple to 140 billion tons a year by 2050 unless consumer nations take drastic steps. The UN environment panel called on governments to 'decouple' economic growth from the rapid rate of natural resource consumption. It said the world is already running out of some essential materials including oil, copper and gold, which in turn, will need rising volumes of fuel and water. Decoupling involves transition to a low-carbon, resource efficient green economy that stimulates growth in a way to keep humanity's footprint within planetary.

Identify the **correct** statement :

Options :

40503634175. 140 billion tons of natural resources will be consumed till the end of 2050

40503634176. Green economy refers to an economy that is based on forest resources

40503634177. Green economy refers to an economy that produces at lower carbon footprint and is resource efficient

40503634178. The UN has asked governments to reduce their economic growth

Question Number : 98 Question Id : 4050369402 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Statement : The citizens of Narbhada city are facing water shortage.

Given are the two courses of action available to the Municipal corporation.

(I) The Municipal Corporation of Narbhada should immediately take action to prevent all water leakages and theft.

(II) The Municipal Corporation of Narbhada should cut the water supply to its residents by half.

Which of the following options is most appropriate ?

Options :

40503634179. only (I)

40503634180. only (II)

40503634181. both (I) and (II)

40503634182. neither (I) nor (II)

Question Number : 99 Question Id : 4050369403 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

In a survey taken for household income in an area, mean annual income of the households came to be Rs 10.0 lakh and the median income was Rs 4.0 lakh per annum. Which of the following statement will explain the difference between mean and median income of the households ?

Options :

40503634183. more than 50% of the households have income around 10.0 lakh

40503634184. more than 50% of the households have income much higher than 10.0 lakh

40503634185. few households have income much higher than 10.0 lakh

40503634186. most of the households have income between 4.0 lakh to 10.0 lakh

Question Number : 100 Question Id : 4050369404 Question Type : MCQ Correct Marks : 4 Wrong Marks : 1

Statement I :

Sustainable development means development that takes place without causing damage to the environment.

Statement II :

Sustainable development means development that meets the needs of the present without compromising the needs of the future generation.

Which of these is **correct** ?

Options :

40503634187. Statement (I) only

40503634188. Statement (II) only

40503634189. Both statements (I) and (II)

40503634190. Neither statement (I) nor (II)