ANSWERS OF CAT 2005

Q. No.	Series				Q. No.	Series				Q. No.	Series			
	111	222	333	444		111	222	333	444		111	222	333	444
1.	1	4	3	4	31.	3	2	4	2	61.	1	1	1	4
2.	3	4	2	1	32.	2	4	3	2	62.	2	2	4	1
3.	2	3	4	2	33.	4	2	3	4	63.	3	4	1	2
4.	4	1	4	2	34.	3	3	2	2	64.	3	4	3	4
5.	1	3	3	4	35.	2	2	2	3	65.	1	1	3	1
6.	2	2	1	4	36.	4	4	2	3	66.	2	1	1	1
7.	2	4	2	3	37.	2	3	4	4	67.	4	3	2	1
8.	4	1	2	1	38.	2	2	3	2	68.	1	3	2	3
9.	4	2	4	3	39.	1	3	1	3	69.	4	1	4	3
10.	3	2	1	2	40.	3	1	2	2	70.	1	2	1	2
11.	4	3	3	1	41.	4	2	2	3	71.	4	3	1	2
12.	1	4	2	2	42.	3	2	3	4	72.	4	3	2	3
13.	2	4	4	1	43.	3	3	2	4	73.	3	2	3	3
14.	3	3	1	4	44.	4	4	4	3	74.	3	3	2	3
15.	2	2	1	3	45.	3	4	3	2	75.	1	3	3	4
16.	1	4	3	3	46.	4	3	4	2	76.	2	1	3	3
17.	2	2	1	2	47.	2	4	3	3	77.	3	2	2	4
18.	4	2	4	1	48.	2	3	4	4	78.	2	4	3	3
19.	4	3	3	4	49.	1	2	2	3	79.	4	2	4	3
20.	3	2	2	1	50.	2	3	1	2	80.	4	3	3	1
21.	3	1	4	3	51.	2	1	4	1	81.	4	2	4	2
22.	2	2	1	4	52.	3	2	3	2	82.	1	1	3	4
23.	1	4	2	4	53.	4	3	2	4	83.	2	4	3	4
24.	1	4	3	3	54.	3	3	3	4	84.	3	4	1	4
25.	1	3	2	2	55.	2	4	2	3	85.	3	1	2	1
26.	3	3	1	4	56.	1	4	1	3	86.	3	4	4	4
27.	4	1	2	1	57.	3	2	3	2	87.	3	4	4	1
28.	4	1	4	2	58.	3	3	3	3	88.	1	3	4	2
29.	3	1	4	3	59.	4	4	4	2	89.	2	3	4	3
30.	2	1	3	2	60.	4	3	4	1	90.	4	4	1	2

Solutions for CAT 2005

Q. No. 111. (1) 222. (4) 333. (6) 444. (8)

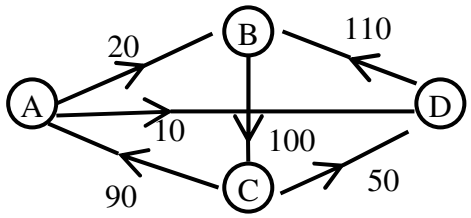
$x = (16^3+17^3+18^3+19^3) = (16+17+18+19)$ (…….) = (70)(----)

So, x will be completely divisible by 70.

Hence (1) i.e. remainder will be 0.

Q. No. 111. (2) 222. (5) 333. (1) 444. (9)

Representing the information in graphical form :-

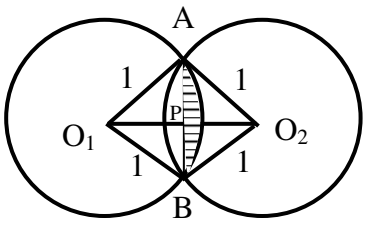


Total outflow is highest in D i.e. (110-50-10) = 50

Time taken to empty = 1000/50 = 20 minutes.

Hence, D, 20 (3).

Q. No. 111. (3) 222. (6) 333. (2) 444. (10)



Length of AP = $1/\sqrt{2} = O_1P = O_2P$

Area of sector $O_1AB = ¼ \times \pi \times 1^2 = \pi/4$

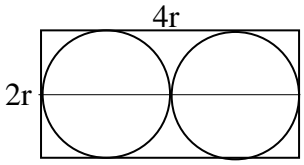
Area of $\Delta O_1AB = ½ \times 1 \times 1 \times \text{Sin } 90^0 = ½$

Area of shaded portion = $\pi/4 - ½$

Required area = $2\{(\pi/4)-(1/2)\} = \pi/2 - 1$

Hence (2)

Q. No. **111. (4)** **222. (7)** **333. (9)** **444. (1)**

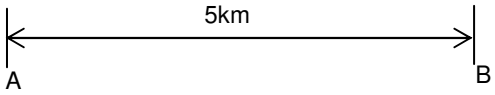


Let radius of circle be r.
Distance covered by A = 12r
Distance covered by B = 4πr
Required % = $\frac{4\pi r - 12r}{12r} \times 100 = \frac{0.56r}{12r} = \frac{0.56}{12} \times 100 \approx 4.7\%$. Hence (4)

Q. No. **111. (5)** **222. (8)** **333. (10)** **444. (2)**

Let number of girls are G.
${}^{G}C_2 = 45$
$\Rightarrow G = 10$
Let number of boys are B
${}^{B}C_2 = 190$
$\Rightarrow B = 20$
Total students = 30
Total games = ${}^{30}C_2 = 435$
No. of games with only one boy & one girl = 435 − 190 −45 = 200. Hence (1)

Series 333 (7 & 8)



The first meeting between Ram & Shyam will take place when Ram is returning from & Shyam is going towards B.
Distance covered by Ram when Shyam stared = 15/4 kms.
Ram reaches B at 10:00 am.
At 10:00 am Shyam is half way.
So, 2.5/15 hrs. = 10 mints. Hence 10:10 am.

When Shyam reaches B, Ram is 5/4 km away from B. So they meet after $\frac{\frac{5}{4}}{5} = \frac{1}{4}$ hrs.
or 15 mins. after 10:15 i.e. 10:30. Hence (2)

Q. No. **111. (6)** **222. (9)** **333. (7)** **444. (3)**

Ans.(2)

Q. No. **111. (7)** **222. (10)** **333. (8)** **444. (4)**

Ans.(2)

Q. No. **111. (8)** **222. (1)** **333. (3)** **444. (5)**

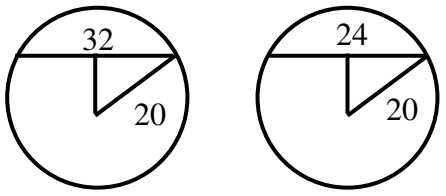
R= $\frac{30^{65} - 29^{65}}{30^{64} + 29^{64}}$

This problem can be solved by taking examples

ex (1) $\frac{3^5 - 2^5}{3^4 + 2^4} = \frac{243 - 32}{81 + 16} = \frac{211}{97}$ which greater than 1

(2) $\frac{4^5 - 3^5}{4^4 + 3^4} = \frac{1024 - 243}{256 + 81} = \frac{781}{337}$ which is greater than 1. Hence (d)

Q. No. **111. (9)** **222. (2)** **333. (4)** **444. (6)**



Distance of 32 cm chord from centre = $\sqrt{20^2 - 16^2}$ = 12

Distance of 24 cm chord from centre = $\sqrt{20^2 - 12^2}$ = 16

If both chords are on the same side distance b/w them = 16-12 = 4

If both chords are on different sides distance b/w them = 16 + 12 = 28

Hence (4)

Q. No. **111. (10)** **222. (3)** **333. (5)** **444. (7)**

$x^2 - y^2 = 0$

$(x - k)^2 + y^2 = 1$

Adding both we get,

$X^2 + (x - k)^2 = 1$

$\Rightarrow 2x^2 - 2kx + k^2 - 1 = 0$

This expression will be a perfect square only when $k = \sqrt{2}$.

i.e. $(\sqrt{2}\, x - 1)^2 = 0$

$\Rightarrow x = 1/\sqrt{2}$, only one solution & that too positive. Hence (3).

Q. No. **111. (11)** **222. (16)** **333. (21)** **444. (26)**

Sum of the given series, p = 11!−1
$\therefore$ p+2= 11!+1. Hence remainder is 1.

Q. No. **111. (12)** **222. (27)** **333. (22)** **444. (27)**

The formula for no. of points inside a triangle is ${}^{n-1}C_2 = {}^{41-1}C_2 = {}^{40}C_2 = \frac{40\times39}{2} = 20 \times 39 =$ 780. Hence (1)

Q. No. **111. (13)** **222. (18)** **333. (23)** **444. (28)**

Taking 108,
801
-108
693
which is divisible by 7.

Taking 299,
992
-299
693
which is again divisible by 7.

Only, option (2) has both nos. inclusive. Hence (2)

Q. No. **111. (14)** **222. (19)** **333. (24)** **444. (29)**

$a_1 = 1$
$a_{n+1} - 3a_n + 2 = 4n$
$a_2 - 3.1 + 2 = 4.1$
$a_2 = 5 = 3^2 - 4$
$a_3 - 3.5 + 2 = 4.2$
$a_3 = 21 = 3^3 - 6$
Similarly = $a_{100} = 3^{100} - 2.100 = 3^{100} - 200$
Hence (3)

Q. No. **111. (15)** **222. (20)** **333. (25)** **444. (30)**

Out of three odd nos. two can be chosen in 3 ways. After that they can be arranged in 2 ways for each of three different combination of odd positions. The remaining odd no. can be placed in 2 ways at 2 even places. After that 2 different even nos. can be placed in 2!

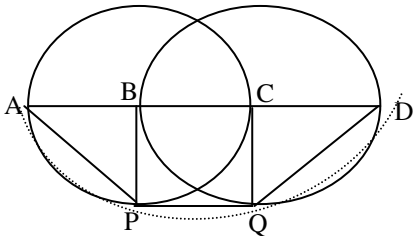
Ways. So, for odd position 1 & 3. Total no. of ways = 3 × 2 × 2 × 2 = 24 Here only 2 & 4 can come at rightmost position, hence, total = 12 × 2 + 12 × 4 = 72
For odd positions 3 & 5
Total no. of ways = 24
Here, 1, 3 & 5 can come at rightmost position, hence total = 8 × 1 + 8 × 3 + 8 × 5 = 72
Similarly for odd positions 1 & 5
Total no. of ways = 24
Here again, 1, 3 & 5 can come at rightmost position
Hence total = 8 × 1 + 8 × 3 + 8 × 5 = 72
Total = 72 × 3 = 216 Hence (2)

Q. No. 111. (16) 222. (21) 333. (26) 444. (11)

$30^{2720} = 3^{2720} \times 10^{2720}$
Last digit before 0 is the last digit of 3^{2720} = 1. Hence (1)

Q. No. 111. (17) 222. (22) 333. (27) 444. (12)

The distance covered by ant is shown by dotted lines. Now the distance is $2\times\frac{1}{4}\times 2\pi\times 1+1=\pi+1$. Hence (2)



Q. No. 111. (18) 222. (23) 333. (28) 444. (19)

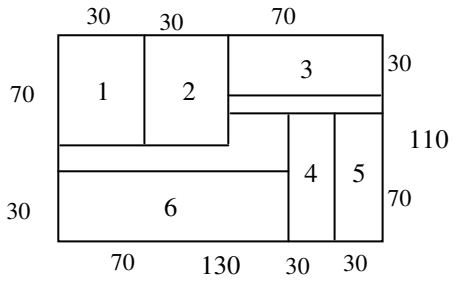
Required expression can be expanded as
$Z = \log_x x - \log_x y + \log_y y - \log_y x = 2 - (\log_x y + \log_y x) = 2 - \left(\frac{\log x}{\log y} + \frac{\log y}{\log x}\right)$
If x = y; z = 2 – z = 0
If x > y the $\left(\frac{\log x}{\log y} + \frac{\log y}{\log x}\right)$ has to be greater than 1. Hence (4)

Q. No. 111. (19) 222. (24) 333. (29) 444. (14)

Let the number be of the form 10x+y.
$\therefore$ x + y + xy = 10x + y; or, 9x – xy = 0; x(9 – y) = 0
Hence x can take values from 1 to 9 and y has to be 9 in all cases.
Hence (4)

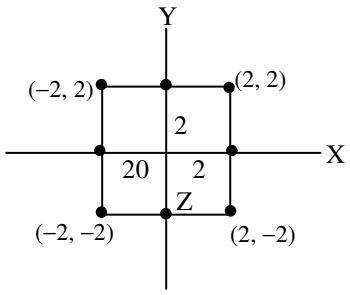
Q. No. **111. (20)** **222. (25)** **333. (30)** **444. (15)**

As per the alongside figure 6 tiles will fit. Hence (3)



Q. No. **111. (21)** **222. (26)** **333. (11)** **444. (16)**

The required graph is as alongside.
Hence the area is 4 × 4 = 16.
Hence (3)



Q. No. **111. (22)** **222. (17)** **333. (12)** **444. (17)**

Let AE = x; $\therefore \frac{x}{3-x} = \frac{1}{2}$; x = 1

Similarly, LN = 1; OE = OL = 0.5

DL = $\sqrt{1.5^2 - 0.5^2} = \sqrt{2}$ $\therefore$ DH = $\sqrt{2} - 0.5$ Hence (2)

Q. No. **111. (23)** **222. (28)** **333. (17)** **444. (13)**

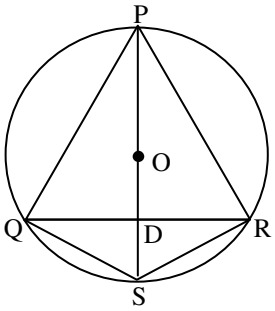
From similar triangles BCD and ABC

$\frac{BC}{BD} = \frac{AC}{AD} = \frac{12}{9} \therefore AC = \frac{12}{9} \times 6 = 8$

$\frac{AB}{BC} = \frac{12}{9}$ $\therefore$ AB = 16 $\therefore$ AD = 7

$\frac{\text{Perimeter of } \Delta ADC}{\text{Perimeter of } \Delta BDC} = \frac{7+6+8}{9+6+12} = \frac{7}{9}$ Hence (1)

Q. No. 111. (24) 222. (29) 333. (14) 444. (18)



PD = $\frac{3r}{2}$

PQ = $\frac{2}{\sqrt{3}} \times \frac{3r}{2} = \sqrt{3}r$

SR = QS = $\frac{\sqrt{3}r}{2} \times \frac{2}{\sqrt{3}} = r$

Perimeter = $2(\sqrt{3}r + r)$ Hence (1)

Q. No. 111. (25) 222. (30) 333. (15) 444. (20)

First 2-digits are 11. Now the last 2-digits can be 13, 19, 31, 37, 55, 73, 79, 91, 97. Hence (1)

Q. No. 111. (26) 222. (11) 333. (16) 444. (21)

$x = \sqrt{4 + \sqrt{4 - \sqrt{4 + \sqrt{4 - \infty}}}}$

$\Rightarrow x < \sqrt{4+2}$

$\Rightarrow x < \sqrt{6} \approx 2.4$ Hence (3)

Q. No. 111. (27) 222. (12) 333. (13) 444. (22)

The required series is -1, 2, 3, 1, -2, -3, -1, 2, 3, 1, -2, -3, … & so on. The series is repeating itself after 6 steps. Hence (4)

Q. No. 111. (28) 222. (13) 333. (18) 444. (23)

Cost of operating per call by male = $\frac{250}{40} + 15 = 6.25 + 15 = 21.25$

Cost of operating per call by female = $\frac{300}{50} + 10 = 6 + 10 = 16$

As the cost of female is less we have to maximize female which at highest is 12.

So, no. of male operators = $\frac{1000 - 12 \times 50}{40} = 10$

Q. No. 111. (29) 222. (14) 333. (19) 444. (24)

Let the Englishmen be E_1, E_2, E_3 and Frenchmen be F_1, F_2, F_3. E_3 and F_3 can communicate with each other.
$E_1 \rightarrow E_2 \rightarrow E_3 \rightarrow$ 2 calls (All into of English shared).
$F_1 \rightarrow F_2 \rightarrow F_3 \rightarrow$ 2 calls (All into of French shared).
$E_3 \rightarrow F_3 \rightarrow$ 1 call (exchange of idea)
$E_3 \rightarrow E_2 \rightarrow E_1 \rightarrow$ 2 calls (French into shared)
$F_3 \rightarrow F_2 \rightarrow F_1 \rightarrow$ 2 calls (English into shared)
Total = 2 + 2 + 1 + 2 + 2 = 9 calls Hence (3)

Q. No. 111. (30) 222. (15) 333. (20) 444. (25)

When we consider the rectangular floor of 12×5 we get 60 squares of 1 cm^2. Now in the edges there are 12 + 12 + 3 + 3 = 30 squares of 1 cm. Remaining squares are 60 – 30 = 30 Hence there is one edge of 12 tiles. Hence (2)

Q. No. 111. (61) 222. (69) 333. (66) 444. (67)
Person retire from finance as there is fluctuation of more than one in two instances. Hence, (1)

Q. No. 111. (62) 222. (70) 333. (67) 444. (70)
There were 3 faculties in Marketing area $\therefore$ total of their ages = $49.33 \times 3 = 148$
Age of the Professor Naresh & Devesh. As on April, 2000 is 53 & 50
$\therefore$ Age of 3rd Faculty in (148 – 53 – 50) = 45
$\therefore$ Age of third faculty on April 1, 2005 = 45 + 5 = 50. Hence, (2)

	Year of Joining
Marketing	2001
OB	2003
Finance	2002
OM	2001

Q. No. 111. (63) 222. (67) 333. (64) 444. (68)
Year of joining new Faculty Member in Finance in 2002. Hence, (3)

Q. No. 111. (64) 222. (68) 333. (65) 444. (69)

Faculty join OM in the year 2001

$\therefore$ on April 1, 2003 Age = 27. Hence, (3)

Q. No. 111. (65) 222. (61) 333. (70) 444. (62)

61. (1) Hariyana = $\frac{19.2}{4\times0.8}=\frac{19.2}{3.2}=6$

Pubjab = $\frac{24}{5\times0.8}=\frac{24}{4}=6$

Andra Pradesh = $\frac{112}{28\times0.8}=5$

U. P = $\frac{67.2}{24\times0.7}=\frac{9.6}{24}=4$ Hence, (1)

Q. No. 111. (66) 222. (62) 333. (68) 444. (63)

62. (2) Per capita production of Gujarat = $\frac{0.24}{51}=\frac{48}{102}=48-0.96=47.04$

For Hariyana =19.2/21 = 76.8/84 = 0.91

Punjab = 24/24 = 1, Maharashtra = 48/97 = 0.50

Andra Pradesh = 112 / 76 = 1.48

$\therefore$ Total four. Hence, (2)

Q. No. 111. (67) 222. (63) 333. (69) 444. (61)

63 (4) Hariyana, Gujarat, Punjab, Madha Pradesh, Tamilnadu, Maharashtra, UP and Andra Pradesh are intensive rice producing state. Total 8. Hence, (4).

Q. No. 111. (68) 222. (66) 333. (61) 444 (66)

	Gender	**Age Group**
Parul	F	Y
Hari	M	I

So out of remaining two atleast one must be female & other two must be person not engaged in month of January so going by option —

Dinesh, Anshul, Fatima, Zeena are engaged in month of January. Hence only option left is Rahul & Yamini. Hence (1)

Q. No. 111. (69) 222. (64) 333. (62) 444. (64)

All the executives who are evaged in 2 out of 3 months Jan, Feb & March cannot attend more than one workshop. There are eleven (Sl. No. 1, 2, 3, 6, 7, 8, 10, 14, 17, 18, 20) out of the remaining 9, there are 5 executives (Eashwarran, Indira, Mandeep, Rahul, Yamini)

who are cannot attend more than one workshop because they are engaged in restrictive months. So total there are 16 executives. Hence, (4)

Q. No. 111. (70) 222. (65) 333. (63) 444. (65)

Going by option

Anshul cannot attend any workshop as he is engaged in Jan. & March. A interested only in CS & EG.

Charu engaged in Jan & Feb and interested in BO & CS. So she also cannot attend any workshop.

There is only one option which includes Anshul & Charu. Hence, (1)

	Returns (%)
A	**20**
B	**10**
C	**30**
D	**40**

Q. No. 111. (75) 222. (82) 333. (71) 444. (87)

	Return (%)	Sector	
A	20	Auto/steel	30
B	10	Cement/IT	20
C	30		30
D	40		40
			120

$\therefore$ Avg. return is 30% Hence (1)

Q. No. 111. (76) 222. (79) 333. (72) 444. (88)

35% Average Return implies a return of 140 which is possible only if D gives 1.5 times of the expected return and A gives double of the expected return which implies that (ii) and (iii) are right. Hence (2)

Q. No. 111. (77) 222. (80) 333. (73) 444. (89)

38.75% Average Return implies a return of 155 which is possible only if C gives a return of 1.5 times than the expected and D gives double return than expected. From this only statement (i) and (iv) are correct. Hence (3)

Q. No. 111. (78) 222. (81) 333. (74) 444. (90)
The minimum return that Venkat can earn is when B gives 1.5 times return and D gives 2 times the return then the return is 33.75% and (iv) is definitely true. Hence (2)

States	Firm A	Firm B	Firm C	Firm D
UP	49	82	80	55
Bihar	69	72	70	65
MP	72	63	72	65
Total	**190**	**217**	**222**	**185**

Q. No. 111. (83) 222. (73) 333. (77) 444. (71)
If statement I to be true, then firm B is a profitable one implying firm C is truthful one. As per statement II, honest limited's total revenue is more that profitable one which is not possible if we take statement I to be true. Hence (2)

Q. No. 111. (84) 222. (72) 333. (76) 444. (73)
If statement I is true the firm B is aggressive implying firm C is an honest one. As per statement II, honest limited's lowest revenue are from Bihar satisfying our assumption that statement II is true. Hence (3)

Q. No. 111. (85) 222. (71) 333. (75) 444. (72)
If statement I is true, then statement II is necessarily false, because if statement I is true it implies that firm B is honest necessarily implying firm C is aggressive. But statement II doesn't goes by this assumption so option (1) is eliminated. Option (2) states that at least one has to be correct or may be both are correct. But the statements are self-contradictory and one has to be true among the two statements. Hence (3)

Q. No. 111. (86) 222. (74) 333. (78) 444. (74)
As profitable limited's lowest revenue is from UP implying firm D or firm A is profitable. Now firm A is truthful because of initial conditions so firm D is a profitable and firm A is truthful. Hence (3)