CMAT Expected Paper
(Difficulty: Easy medium)

Ck CMAT Finale Sheet

Section	Ques	Marks	Time	Target Score		Attempt Score	
				Final	MyScore	Final	MyScore
Quant & DI	20	80	50	70		18	
Logical Reasoning	20	80	50	70		18	
Language Compre	20	80	45	60		15	
Innov & Entrep	20	80	20	50		13	
General Awareness	20	80	15	50		13	
	100	400	180	300		75	
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Quantitative Ability

1. Find the smallest number by which 81 of the following numbers must be divided to obtain a perfect cube:
   - 3
   - 4
   - 2
   - 5
2. In how many different ways can the letters of the word 'LEADING' be arranged in such a way that the vowels always come together?
   - 360
   - 480
   - 720
   - 5040

3. $$\frac{1}{1 + a^{(n - m)}} + \frac{1}{1 + a^{(m - n)}} = ?$$
   - 0
   - 1
   - 2
   - 3

4. Gauri went to the stationers and bought things worth Rs. 25, out of which 30 paise went on sales tax on taxable purchases. If the tax rate was 6%, then what was the cost of the tax free items?
- Rs. 15
- Rs. 15.70
- Rs. 19.70
- Rs. 20

5. January 1, 2007 was Monday. What day of the week lies on Jan. 1, 2008?
- Monday
- Tuesday
- Wednesday
- Sunday

6. The average of 20 numbers is zero. Of them, at the most, how many may be greater than zero?

- 0
- 1
- 10
- 19

7. The average weight of 8 person's increases by 2.5 kg when a new person comes in place of one of them weighing 65 kg. What might be the weight of the new person?

- 76 kg
- 76.5 kg
- 85 kg
- Data inadequate

8. The curved surface area of a cylindrical pillar is 264 m^2 and its volume is 924 m^3. Find the ratio of its diameter to its height.

- 3 : 7
- 7 : 3
- 6 : 7
- 7 : 6

9. What is the capacity of the cylindrical tank?

I. The area of the base is 61,600 sq. cm.
II. The height of the tank is 1.5 times the radius.
III. The circumference of base is 880 cm.

- Only I and II
- Only II and III
- Only I and III
- Any two of the three

10. It is being given that $(2^{32} + 1)$ is completely divisible by a whole number. Which of the following numbers is completely divisible by this number?

- $(2^{16} + 1)$
- $(2^{16} - 1)$
- (7×2^{23})

- $(2^{96} + 1)$

11. The L.C.M. of two numbers is 48. The numbers are in the ratio 2 : 3. Then sum of the number is:
- 28
- 32
- 40
- 64

12. The salaries A, B, C are in the ratio 2 : 3 : 5. If the increments of 15%, 10% and 20% are allowed respectively in their salaries, then what will be new ratio of their salaries?
- 3 : 3 : 10
- 10 : 11 : 20
- 23 : 33 : 60
- Cannot be determined

13. A tank is filled by three pipes with uniform flow. The first two pipes operating simultaneously fill the tank in the same time during which the tank is filled by the third pipe alone. The second pipe fills the tank 5 hours faster than the first pipe and 4 hours slower than the third pipe. The time required by the first pipe is:
- 6 hours
- 10 hours
- 15 hours
- 30 hours

14. In what ratio must a grocer mix two varieties of pulses costing Rs. 15 and Rs. 20 per kg respectively so as to get a mixture worth Rs. 16.50 kg?
- 3 : 7
- 5 : 7
- 7 : 3
- 7 : 5

15. At a game of billiards, A can give B 15 points in 60 and A can give C to 20 points in 60. How many points can B give C in a game of 90?

- 30 points
- 20 points
- 10 points
- 12 points

16. The true discount on a bill of Rs. 540 is Rs. 90. The banker's discount is:
- Rs. 60
- Rs. 108
- Rs. 110
- Rs. 112

17. Which of the following statements is not correct?
- $\log_{10} 10 = 1$
- $\log (2 + 3) = \log (2 \times 3)$
- $\log_{10} 1 = 0$
- $\log (1 + 2 + 3) = \log 1 + \log 2 + \log 3$

18. A boatman goes 2 km against the current of the stream in 1 hour and goes 1 km along the current in 10 minutes. How long will it take to go 5 km in stationary water?
- 40 minutes
- 1 hour
- 1 hr 15 min
- 1 hr 30 min

19. In a camp, there is a meal for 120 men or 200 children. If 150 children have taken the meal, how many men will be catered to with remaining meal?
- 20
- 30
- 40
- 50

20. Two, trains, one from Howrah to Patna and the other from Patna to Howrah, start simultaneously. After they meet, the trains reach their

destinations after 9 hours and 16 hours respectively. The ratio of their speeds is:

- 2 : 3
- 4 : 3
- 6 : 7
- 9 : 16

Answer:
Solution:

Prime factors of 128 = 2×2×2×2×2×2x2
Here one factor 2 does not appear in a 3's group.
Therefore, 128 must be divided by 2 to make it a perfect cube

The word 'LEADING' has 7 different letters.
When the vowels EAI are always together, they can be supposed to form one letter.
Then, we have to arrange the letters LNDG (EAI).
Now, 5 (4 + 1 = 5) letters can be arranged in 5! = 120 ways.
The vowels (EAI) can be arranged among themselves in 3! = 6 ways.
Required number of ways = (120 x 6) = 720.

$$\frac{1}{1 + a^{(n-m)}} + \frac{1}{1 + a^{(m-n)}} = \frac{1}{\left(1 + \frac{a^n}{a^m}\right)} + \frac{1}{\left(1 + \frac{a^m}{a^n}\right)}$$

$$= \frac{a^m}{(a^m + a^n)} + \frac{a^n}{(a^m + a^n)}$$

$$= \frac{(a^m + a^n)}{(a^m + a^n)}$$

$$= 1.$$

Let the amount taxable purchases be Rs. x.
Then, 6% of x = 30/100
=> 300/100 x 100/6 = 5
∴ Cost of tax free items = Rs. [25 - (5 + 0.30)] = Rs. 19.70

The year 2007 is an ordinary year. So, it has 1 odd day.
1st day of the year 2007 was Monday.
1st day of the year 2008 will be 1 day beyond Monday.
Hence, it will be Tuesday.

Average of 20 numbers = 0.
Sum of 20 numbers (0 x 20) = 0.
It is quite possible that 19 of these numbers may be positive and if their sum is a then 20th number is (-a).

Total weight increased = (8 x 2.5) kg = 20 kg.
Weight of new person = (65 + 20) kg = 85 kg.

$$\frac{\pi r^2 h}{2\pi r h} = \frac{924}{264} \Rightarrow r = \left(\frac{924}{264} \times 2\right) = 7 \text{ m.}$$

$$\text{And, } 2\pi r h = 264 \Rightarrow h = \left(264 \times \frac{7}{22} \times \frac{1}{2} \times \frac{1}{7}\right) = 6\text{m.}$$

$$\therefore \text{ Required ratio} = \frac{2r}{h} = \frac{14}{6} = 7 : 3.$$

Capacity = $\pi r^2 h$.
I gives, $\pi r^2 = 61600$. This gives r.
II gives, $h = 1.5\ r$.
Thus, I and II give the answer.
Again, III gives $2\pi r = 880$. This gives r.
So, II and III also give the answer.
$\therefore$ Correct answer is (D).

Let $2^{32} = x$. Then, $(2^{32} + 1) = (x + 1)$.
Let $(x + 1)$ be completely divisible by the natural number N. Then,
$(2^{96} + 1) = [(2^{32})^3 + 1] = (x^3 + 1) = (x + 1)(x^2 - x + 1)$, which is completely divisible by N, since $(x + 1)$ is divisible by N.

Let the numbers be $2x$ and $3x$.
Then, their L.C.M. = $6x$.
So, $6x = 48$ or $x = 8$.
$\therefore$ The numbers are 16 and 24.
Hence, required sum = (16 + 24) = 40.

Let A = $2k$, B = $3k$ and C = $5k$.

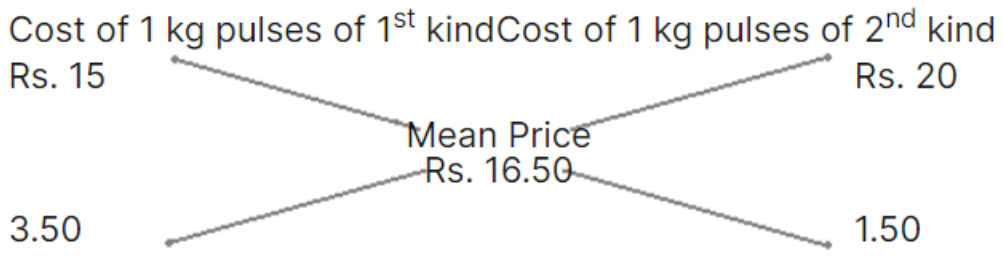
A's new salary =	$\frac{115}{100}$	of $2k$ =	$\left(\frac{115}{100} \times 2k\right)$	=	$\frac{23k}{10}$			
B's new salary =	$\frac{110}{100}$	of $3k$ =	$\left(\frac{110}{100} \times 3k\right)$	=	$\frac{33k}{10}$			
C's new salary =	$\frac{120}{100}$	of $5k$ =	$\left(\frac{120}{100} \times 5k\right)$	= $6k$				
∴ New ratio	$\left(\frac{23k}{10}\right.$	:	$\frac{33k}{10}$	$\left. : 6k\right)$	= 23 : 33 : 60			

Suppose, first pipe alone takes x hours to fill the tank .
Then, second and third pipes will take (x -5) and (x - 9) hours respectively to fill the tank.

∴	$\frac{1}{x}$	+	$\frac{1}{(x-5)}$	=	$\frac{1}{(x-9)}$
⇒	$\frac{x-5+x}{x(x-5)}$	=	$\frac{1}{(x-9)}$		

⇒ $(2x - 5)(x - 9) = x(x - 5)$
⇒ $x^2 - 18x + 45 = 0$
$(x - 15)(x - 3) = 0$
⇒ $x = 15$. [neglecting $x = 3$]

By the rule of alligation:



∴ Required rate = 3.50 : 1.50 = 7 : 3.

A : B = 60 : 45.

A : C = 60 : 40.

$\therefore \frac{B}{C} = \left(\frac{B}{A} \times \frac{A}{C}\right) = \left(\frac{45}{60} \times \frac{60}{40}\right) = \frac{45}{40} = \frac{90}{80} = 90 : 80.$

$\therefore$ B can give C 10 points in a game of 90.

P.W. = Rs. (540 - 90) = Rs. 450.

$\therefore$ S.I. on Rs. 450 = Rs. 90.

S.I. on Rs. 540 = Rs. $\left(\frac{90}{450} \times 540\right)$ = Rs. 108.

$\therefore$ B.D. = Rs. 108.

(a) Since $\log_a a = 1$, so $\log_{10} 10 = 1$.

(b) log (2 + 3) = log 5 and log (2 x 3) = log 6 = log 2 + log 3

$\therefore$ log (2 + 3) $\neq$ log (2 x 3)

(c) Since $\log_a 1 = 0$, so $\log_{10} 1 = 0$.

(d) log (1 + 2 + 3) = log 6 = log (1 x 2 x 3) = log 1 + log 2 + log 3.

So, (b) is incorrect.

Rate downstream = $\left(\frac{1}{10} \times 60\right)$ km/hr = 6 km/hr.

Rate upstream = 2 km/hr.

Speed in still water = $\frac{1}{2}$(6 + 2) km/hr = 4 km/hr.

$\therefore$ Required time = $\left(\frac{5}{4}\right)$ hrs = 1 $\frac{1}{4}$ hrs = 1 hr 15 min.

There is a meal for 200 children. 150 children have taken the meal.

Remaining meal is to be catered to 50 children.

Now, 200 children 120 men.

50 children = 120 / 200 x 50 = 30 men

Let us name the trains as A and B. Then,

(A's speed) : (B's speed) = b : a = V16 : V9 = 4 : 3.