

# Foundation Course on Quantitative Aptitude - Part III

Course on General Aptitude and Engineering Mathematics for GATE  
2023-24

7pm  
8pm  
9pm

GATE 2012  
General Aptitude Solutions.

Detailed General Aptitude Solutions.

(ME, CE, INI, CH, ECE, EEE,  
XE, XII, CGE)

# General Aptitude

# **PYQ'S on Quantitative Aptitude**

## **- III**

# Question 1

Given set A = {2, 3, 4, 5} and Set B = {11, 12, 13, 14, 15}, two numbers are randomly selected, one from each set. What is probability that the sum of the two numbers equals 16?

- A. 0.20
- B. 0.25
- C. 0.30
- D. 0.33

# Answer

- Option A)

## Question 2

Ram and Ramesh appeared in an interview for two vacancies in the same department. The probability of Ram's selection is  $1/6$  and that of Ramesh is  $1/8$ . What is the probability that only one of them will be selected?

- A.  $47/48$
- B.  $1/4$
- C.  $13/48$
- D.  $35/48$

# Answer

Option B)

# Question 3

From a circular sheet of paper of radius 30cm, a sector of 10% area is removed. If the remaining part is used to make a conical surface, then the ratio of the radius and height of the cone is\_\_\_\_\_.

- A. 3.14
- B. 2.06
- C. 1.5
- D. 3

# Answer

Option B)

1, 3, 5, 7, 9, 11, 13

# Question 4

difference between the

numbers are same.

In a sequence of 12 consecutive odd numbers, the sum of the first 5 numbers is 425. What is the sum of the last 5 numbers in the sequence?

- A. 425
- B. 495
- C. 625
- D. 575

$$\begin{aligned}
 & \text{Sum} = 425 \\
 & \text{Numbers} = 5 \\
 & \text{Average} = \frac{425}{5} = 85. \\
 & \text{Middle number} = 85 \\
 & \text{Sequence: } 81, 83, 85, 87, 89 \\
 & \quad \quad \quad \quad \quad = 425. \\
 & \text{Sequence: } 91, 93, 95, 97, 99 \\
 & \quad \quad \quad \quad \quad = 495 \\
 & \text{Difference: } 10, 12, 14, 16, 18, 20, 22
 \end{aligned}$$

$$\begin{aligned}
 & a, a+2, a+4, a+6, a+8 \\
 & a+10, a+12 \\
 & a+a+2+a+4+a+6 \\
 & +a+8 = 425.
 \end{aligned}$$

$$5a + 20 = 425.$$

$$5a = 405$$

$$a = 81$$

$$\begin{aligned}
 & a+4, a+6, a+8, a+10, a+12 \\
 & , a+14
 \end{aligned}$$

# Answer

Option B)

$$A = 2P.$$

$$2^{\wedge} \left(\frac{1}{10}\right)$$

## Question 5

$$t=10$$

Industrial consumption of power doubled from 2000-2001 to 2010-2011.  
Find the annual rate of increase in percent assuming it to be uniform over  
the years.

$$A = P \left(1 + \frac{R}{100}\right)^n$$

$$CI = A - P$$

A. 5.6

B. 7.2

C. 10.0

D. 12.2

$$2P = P \left(1 + \frac{R}{100}\right)^{10}$$

$$2^{10} = 1 + \frac{R}{100}$$

$$1.071 = 1 + \frac{R}{100}$$

$$0.071 = \frac{R}{100} = R = 0.071 \times 100 = 7.1\%$$

$$\dot{P} = 100$$

$$\dot{J} = 200.$$

$$100 : 200$$

$$100 : 200$$

$$100 : 200.$$

$$\eta = 3 =$$

$$\begin{array}{r} 100 & 200 \\ 100 & 200 \\ \hline 100000 & 400000 \end{array}$$

---

$$1000000 : 8000000$$

$$\frac{30000}{100000} \times 100 = 300\%$$

$$C_I = 7000000.$$

$$R = \frac{7000000}{10000000} \times 100 = 700\%$$

# Answer

- Option B)

# Question 6

numbers are fixed

A five digit number is formed using the digits 1,3,5,7 and 9 without repeating any of them. What is the sum of all such possible five digit numbers?

1, 10, 100, 1000, 10000

$$4! = 24 \text{ ways}$$

- A. 6666660
- B. 6666600
- C. 6666666
- D. 6666606



$$24(1+3+5+7+9) = 24(25) = 600.$$

$$\begin{aligned} 600 & \left[ 1 + 10 + 100 + 1000 + 10000 \right] = 600 \left[ 11110 + 1 \right] \\ & = 600 \left[ 11111 \right] = 666600 \end{aligned}$$

10,000

1000

100

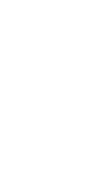
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Ten



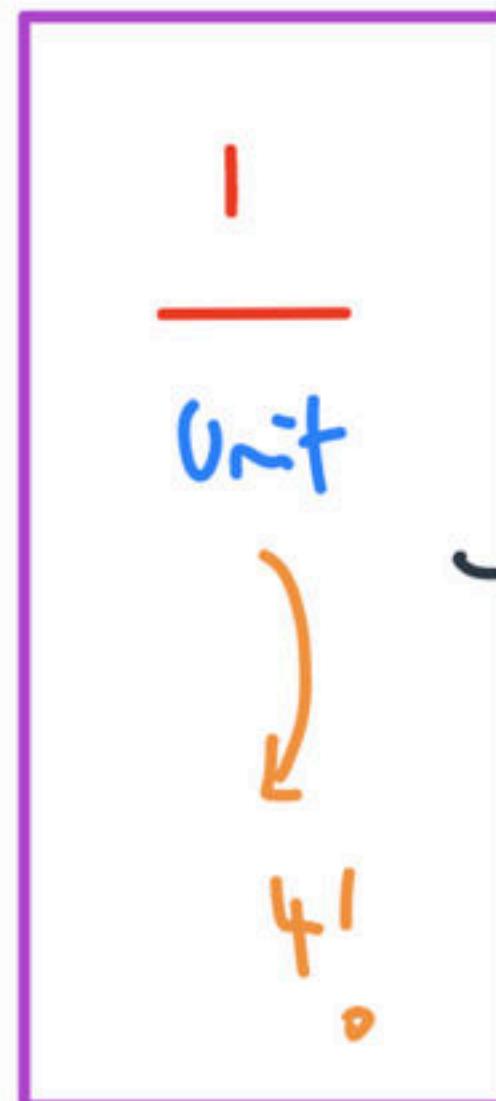
4!

4!

4!



4!

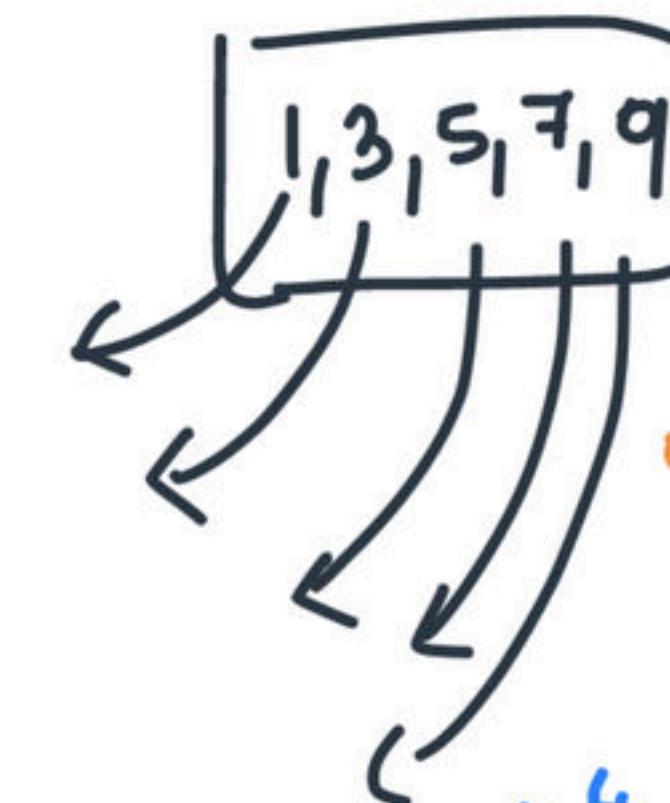


= 1111

Condition = No number

in

repeated



$$5 - 1 = 4.$$

$$10^4 = 10,000.$$

$$4! \times 1111 \times 1 =$$

$$4! \times 1111 \times 1 =$$

$$4! \times 1111 \times 3 =$$

$$4! \times 1111 \times 5 =$$

$$4! \times 1111 \times 7 =$$

$$= 4! \times 1111 \times (1+3+5+7+9)$$

# Answer

- Option B)

Boat & Streams:-

## Question 7

Stillwater =  $\bar{V}$  = Speed of the boat,  $U$  = Speed of the Current

A man can row at 8 km per hour in still water. [If it takes him thrice as long to row upstream, as to row downstream], then find the stream velocity in km per hour.

- A. 4 km/hr
- B. 6 km/hr
- C. 2 km/hr
- D. 8 km/hr

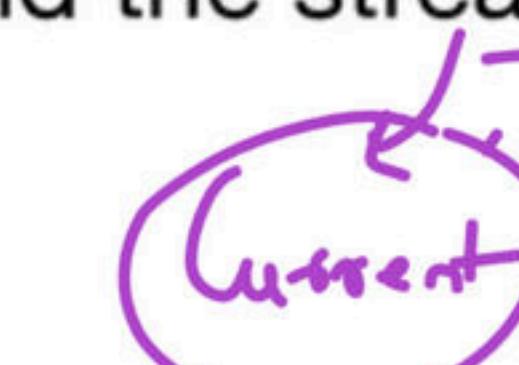
$$\text{Upstream} = \bar{V} - U$$

$$\text{Downstream} = \bar{V} + U$$

$$\bar{V} = 8 \text{ km/h} \quad D = S \times T$$

$$S \propto \frac{1}{T}$$

$$\frac{D}{S} = T$$



$$\frac{\bar{V}+U}{\bar{V}-U} = \frac{3}{1}$$

$$\bar{V} = 4R$$

$$U = 2R$$

$$4R = 8$$

$$R = 2$$

$$2R = 4 \text{ km/hr.}$$

Time :- 1h : 3h

Speed :- 3 : 1

Upstream = against the current  
Downstream = along the current

# Answer

- Option A)

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

$$\text{Avg} = \frac{\text{Total D}}{\text{Total T}}$$

A car travels 8 km in the quarter of an hour, 6 km in the second quarter and 16 km in the third quarter. The average speed of the car in km per hour over the entire journey is

$$(\frac{1}{4} \times 60 = 15 \text{ mins})$$

15 mins.

1 hour = 60 mins.

$$\text{Total Distance} = 8 + 6 + 16 = 30 \text{ km}$$

A. 30

$$\text{Total time} = 45 \text{ mins} = \frac{3}{4} \text{ hrs.}$$

B. 36

C. 40

$$\frac{30}{45} = \frac{2}{3} \text{ km/min}$$

$$\frac{\frac{30}{3}}{4} = \frac{30 \times 4}{3} = 40 \text{ km/hr.}$$

D. 24

$$= \frac{2}{3} \times 60 = 40 \text{ km/hr}$$

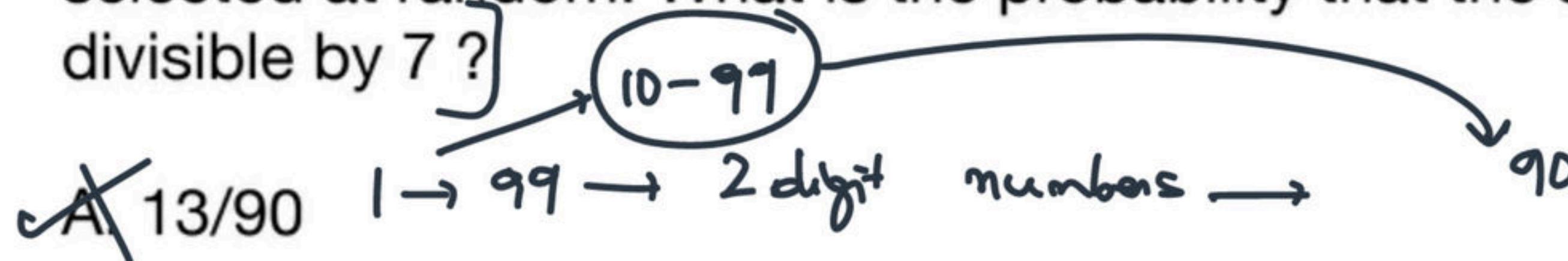
# Answer

- Option C)

$$[- \quad Aa \div 7]$$

# Question 9

Out of all the 2-digit integers between [1 and 100] a 2-digit number has to be selected at random. What is the probability that the selected number is [not divisible by 7]?



~~A~~ 13/90

B. 12/90 ~~14, 21, 28, 35, 42, 49, 56, 63, 70, 77, 84, 91, 98~~

C. 78/90

$$\checkmark D. 77/90 \quad \left( \frac{13}{90} \right) \div 7 = 1 - \frac{13}{90} = \frac{90 - 13}{90} = \frac{77}{90}$$

# Answer

Option D)

Total Distance =  $D$

$$\text{Total time} = \frac{1}{2} \times 60 + \frac{1}{4} \times 30 + \frac{1}{4} \times 10.$$

## Question 10

$$40 \begin{array}{l} (120, 40) \\ 3 \end{array}$$

A tourist covers half of his journey by train at 60 km/h, half of the remainder by bus at 30 km/h and the rest by cycle at 10 km/h. The average speed of the tourist in km/h during his entire journey is

A. 36

B. 30

C. 24

D. 18

$$= \frac{D}{\frac{1}{2} \times 60 + \frac{1}{4} \times 30 + \frac{1}{4} \times 10.}$$

$$= \frac{D}{\frac{1}{2} \times 60 + \frac{1}{4} \times 30 + \frac{1}{4} \times 10} =$$

$$= \frac{D}{\frac{1}{20} + \frac{1}{120} + \frac{1}{40}} =$$

$$\frac{D}{\frac{1+1+3}{120}} = \frac{D}{\frac{5}{120}} = \frac{D}{\frac{1}{24}} = 24$$

# Answer

- Option C)

# Question 11

$$\frac{W}{T} = E$$

$\uparrow$  Ratio

The current erection cost of a structure is Rs. 13,200. If the labour wages per day increase by  $1/5$  of the current wages and the working hours decrease by  $1/24$  of the current period, then the new cost of erection in Rs is

- A. 16,500
- B. 15,180
- C. 11,000
- D. 10,120

$$\frac{1}{5} \rightarrow \text{Increase}$$

Current wages.

$$\frac{15840}{1.24} = 660 \rightarrow \text{decreased}$$

$$15840 - 660 = 15180$$

$$\begin{aligned} & \text{S1} - 13,200 \\ & 1R = 2640 \\ & \quad \downarrow + \text{Current} = \end{aligned}$$

$$\begin{aligned} \text{Total Cost} &= 6R = 2640 \times 6 \\ &= 15840 \text{ Rs.} \\ & \quad \downarrow \\ & \quad \text{Current wages} \end{aligned}$$

# Answer

- Option B)

Total notes = 14       $\rightarrow$  Rs. 20  $\rightarrow x$   
                                 $\rightarrow$  Rs. 10  $\rightarrow y$

Total Value = 230.

Raju has 14 currency notes in his pocket consisting of only Rs. 20 notes and Rs. 10 notes. total money value of the notes is Rs. 230. The number of Rs.10 notes that Raju has is  $\underline{\text{?}}$ .

A. ~~5~~ = 50       $x + y = 14 \times 20$

B. ~~6~~       $20x + 10y = 230$

C. ~~9~~

D. ~~10~~

~~50 + 130~~

## Question 12

~~$20x + 20y = 280$~~

~~$20x + 10y = 230$~~

$10y = 50$

$y = 5$

# **General Aptitude**

# **PYQ'S on Quantitative Aptitude**

## **- IV**

# Question 1

$$360^\circ = 10\pi$$

10π

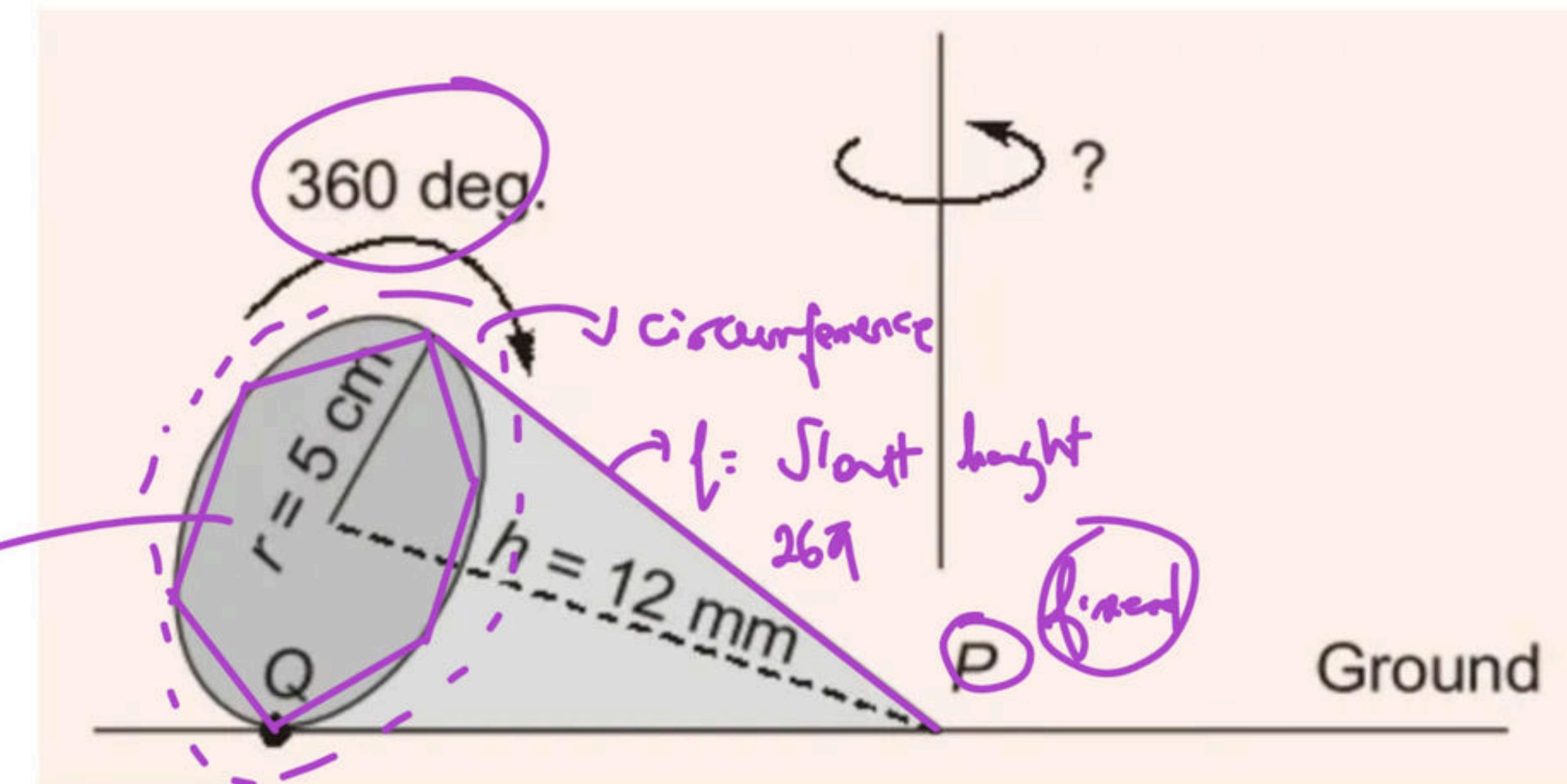
$$\theta = 360^\circ$$

- A right angled cone (base radius 5cm, and height 12 cm) as shown in the figure below, is rolled on the ground keeping the point P fixed until the point Q (at the base of the cone, as shown) touches the ground again. By what angle (in radians) about P does the cone travel?

- A.  $5\pi/12$
- B.  $5\pi/24$
- C.  $24\pi/5$
- D.  $10\pi/13$

$$\frac{\pi}{180}$$

Circum



$$\text{Circumference} = 2\pi r . \quad r=5 , h=12 .$$

$$2\pi r = 10\pi \text{ cm}$$

$$l = \sqrt{h^2 + r^2}$$

$$l = \sqrt{144 - 25}$$

$$l = \sqrt{169} \times 2$$

$$l = 13 \text{ cm}$$

$$\frac{10\pi}{26\pi} \times \frac{360}{360} \times \frac{\pi}{180} =$$

$$\frac{5\pi}{13\pi} \times 2\pi$$

$$= \frac{10}{13}$$

# Answer

- Option D)

$\text{Mean} = \text{Average}$

## Question 2

middle

In a company with 100 employees, 45 earn Rs. 20000 per month, 25 earn Rs 30000, 20 earn Rs 40000, 8 earn Rs 60000 and 2 earn Rs 150000. The median of the salaries is?

- A. Rs. 20000
- B. Rs. 30000
- C. Rs. 32300
- D. Rs. 40000

$$\eta = 100$$

Median salary =

45 → 20000.  
25 → 30000.

45 → 20000.  
25 → 30000.

$$\frac{100}{2} = 50.$$

50<sup>th</sup>, 51<sup>st</sup>

$$\frac{50 + 51}{2} = \frac{30000 + 30000}{2}$$

$$= 30000$$

# Answer

Option B)

# Question 3

What is the sum of the missing digits in the subtraction problem below?

$$\begin{array}{r} 5 \underline{0} 0 0 0 \\ -4 8 \underline{8} 8 9 \\ \hline =1 1 1 1 \\ \hline \end{array}$$

A. 8

$$\begin{array}{r} 50000 \\ 48889 \\ \hline 01111 \\ \hline \end{array}$$

$$[0+6+0+6+6] = 8$$

- B. 10
- C. 11
- D. Cannot be determined

# Answer

Option D)

# Question 4

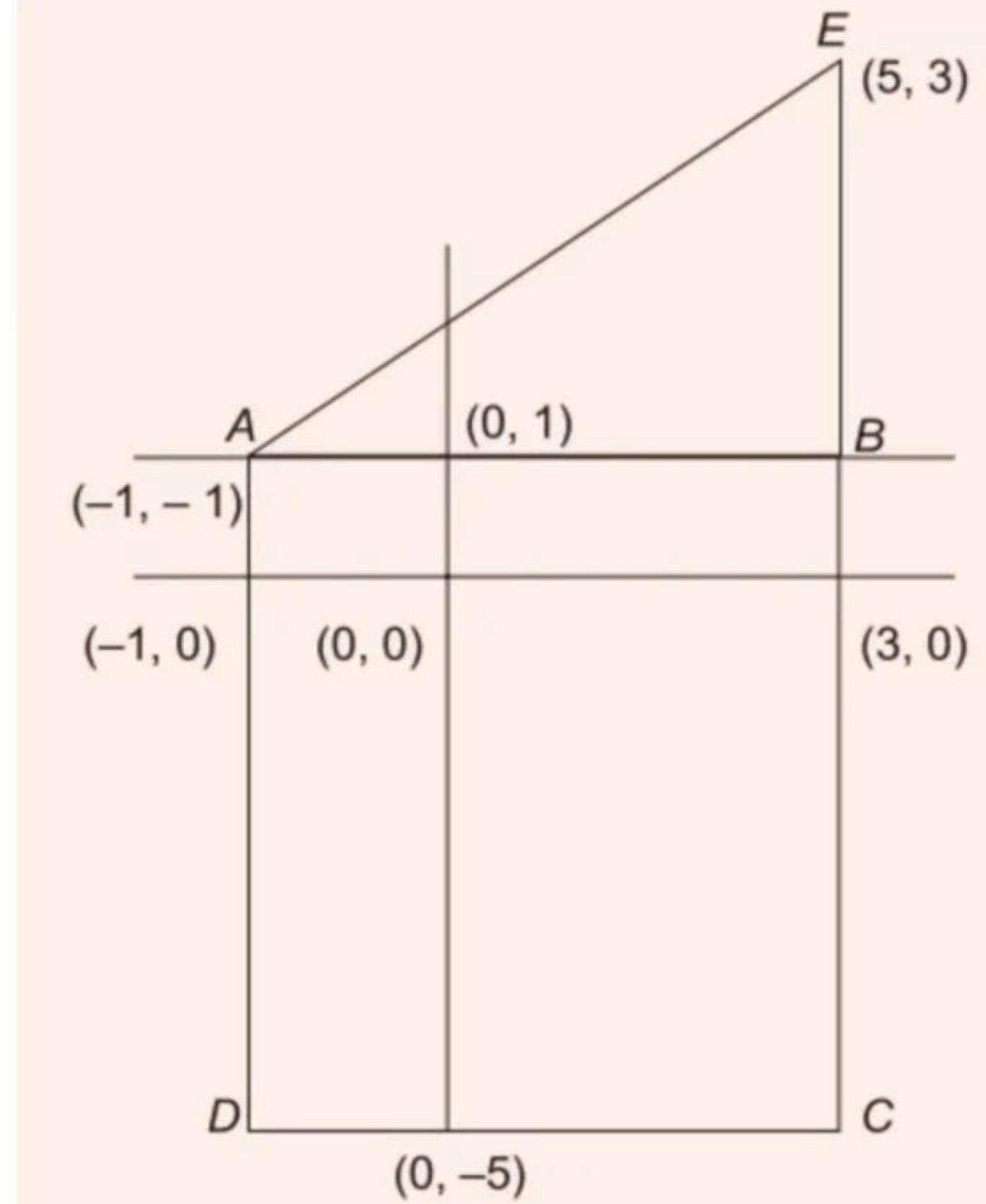
Let  $S_1$  be the plane figure consisting of the points  $(x,y)$  given by the inequalities  $|x - 1| \leq 2$  and  $|y + 2| \leq 3$ . Let  $S_2$  be the plane figure given by the inequalities  $x - y \geq 2$ ,  $y \geq 1$  and  $x \leq 3$ . Let  $S$  be the union of  $S_1$  and  $S_2$ . The area of  $S$  is??

A. 26

B. 28

C. 32

D. 34



# Answer

Option C)

$\text{Mean} = \text{Average} = \frac{\text{Sum}}{n}$

$\text{Median} = \text{middlemost number}$

$\text{Mode} = \text{highest occurring number}$

1, x, x, x, 7, y, 9, 16, 18  
→ middle term.

## Question 5

**3 times** The following sequence of numbers is arranged in increasing order: 1, ~~x, x, x, y, y, 9, 16, 18~~. Given that the mean and median are equal, and are also equal to twice the mode, the value of y is?

A. 5

$$\text{Mean} = \text{Median}$$

B. 6

$$\text{Mean} = \frac{1+3x+2y+9+16+18}{9} = \frac{44+3x+2y}{9} = 7$$

C. 7

$$7 = \frac{7(2x)}{14x} = \frac{1}{2}$$

D. 8

$$\frac{3x+2y+44}{9} = 7$$

$$3x+2y+44 = 63$$

$$\text{Mean} = 2 \times \text{mode}$$

$$\text{mode} = x$$

$$\text{Median} = y$$

$$y = 2x$$

$$y = 2x \\ 2x = 8$$

$$2x = y$$

$$3x - 2y + 44 = 0 \\ 44 = 11x$$

$$x = 4$$

# Answer

- Option D)

$$V = \frac{1}{3} \pi r^2 h$$

## Question 6

If the radius of a right circular cone is increased by 50%, its volume increases by?

- A. 75%
- B. 100%
- C. 125% ✓
- D. 237.5%

$$100\% + 50\% = 150\%$$

decreased

$$\begin{array}{rcl} V_1 & & V_2 \\ 2 & : & 3 \\ 2 & : & 3 \\ \hline 4 & : & 9 \end{array}$$

$$50\% = \frac{50}{100} = \frac{1}{2}$$

$$\begin{array}{rcl} 100 & : & 150 \\ 100 & : & 150 \\ \hline 10000 & : & 22500 \end{array}$$

$\frac{5}{4} \times 100 = 125\%$

12500

$$\frac{12500}{10000} \times 100$$

$\pi r^2$

125%

Decreased by 50%, what would be change in the Volume?

$$V_1 \quad V_2$$

$$50\% = \frac{1}{2} \rightarrow 2-1$$

$$\begin{array}{r} 2 : 1 \\ 2 : 1 \\ \hline 4 : 1 \end{array}$$

$$\frac{3}{4} \times 100 = \downarrow 75\%$$

# Answer

- Option C)

P → 30mins

Q → 20mins

R → 60mins

S → 15mins.

## Question 7

P → 30mins × 3 = 1hour

Q → 20mins × 3 = 1hour

R → 60mins × 1 = 1hour

S → 15mins × 4 = 1hour

= 1hour

Two machines M<sub>1</sub> and M<sub>2</sub> are able to execute any of four jobs [P, Q, R and S]. The machines can perform one job on one object at a time. Jobs P, Q, R and S take 30 minutes, 20 minutes, 60 minutes and 15 minutes each respectively. There are 10 objects each requiring exactly one job. Job P is to be performed on 2 objects, Job Q on 3 objects, Job R on 1 object and Job S on 4 objects. What is the minimum time needed to complete all the jobs?

A. 2 hours

B. 2.5 hours

C. 3 hours

D. 3.5 hours

M<sub>1</sub>

(1hour)

P → 30 × 2

M<sub>2</sub>

S → 15 × 4

R → 60 × 1

(1hour)

Q → 20 × 3

# Answer

- Option A)

$(1, 0, 6, 5) = \text{Same.}$

## Question 8

$(2, 3, 7, 8)$

$$4^{\text{odd}} = 4$$

$$\frac{1}{4} = R$$

$$\frac{1}{4} = R - 1$$

The last digit of  $(2171)^7 + (2172)^9 + (2173)^{11} + (2174)^{13}$  is ?

A. 2

$$1^7 = 1$$

B. 4

$$2^1 = 2$$

C. 6

$$3^3 = 27$$

D. 8

$$4^{13} = 4$$

$$1 + 2 + 27 + 4$$

$$= 34$$

$$\frac{11}{4} = 9 = 3$$

$$4^{12} = 4$$

# Answer

- Option B)

# Question 9

10 digit number =  $(0, 9)$   $(10)^k$

The probability that a k-digit number does NOT contain the digits 0, 5 or 9 is?

A.  $0.3^k$

$10 - 3 = 7$  digits.

B.  $0.6^k$

$$\frac{(7)^k}{(10)^k} = (0.7)^k$$

C.  $0.7^k$

D.  $0.9^k$

# Answer

Option C)

# Question 10

$$24 \times 16^2$$

$$27 \times 16^2$$

$$32 \times 16^2$$

$$36 \times 16^2$$

$$5 \times 5 \times 5$$

$$4 \times 4 \times 4$$

$$3 \times 3 \times 3$$

$$\textcircled{9}^3$$

Find the smallest number  $y$  such that  $y * 162$  is a perfect cube?

A.  $\textcircled{24}$   $\rightarrow$  # Prime factorization = (Prime numbers)

B.  $27 \rightarrow 2, 3, 5, 7, 11, 13$

C.  $32 \rightarrow 2^5$

D.  $36 \rightarrow 2^2 \times 3^2$

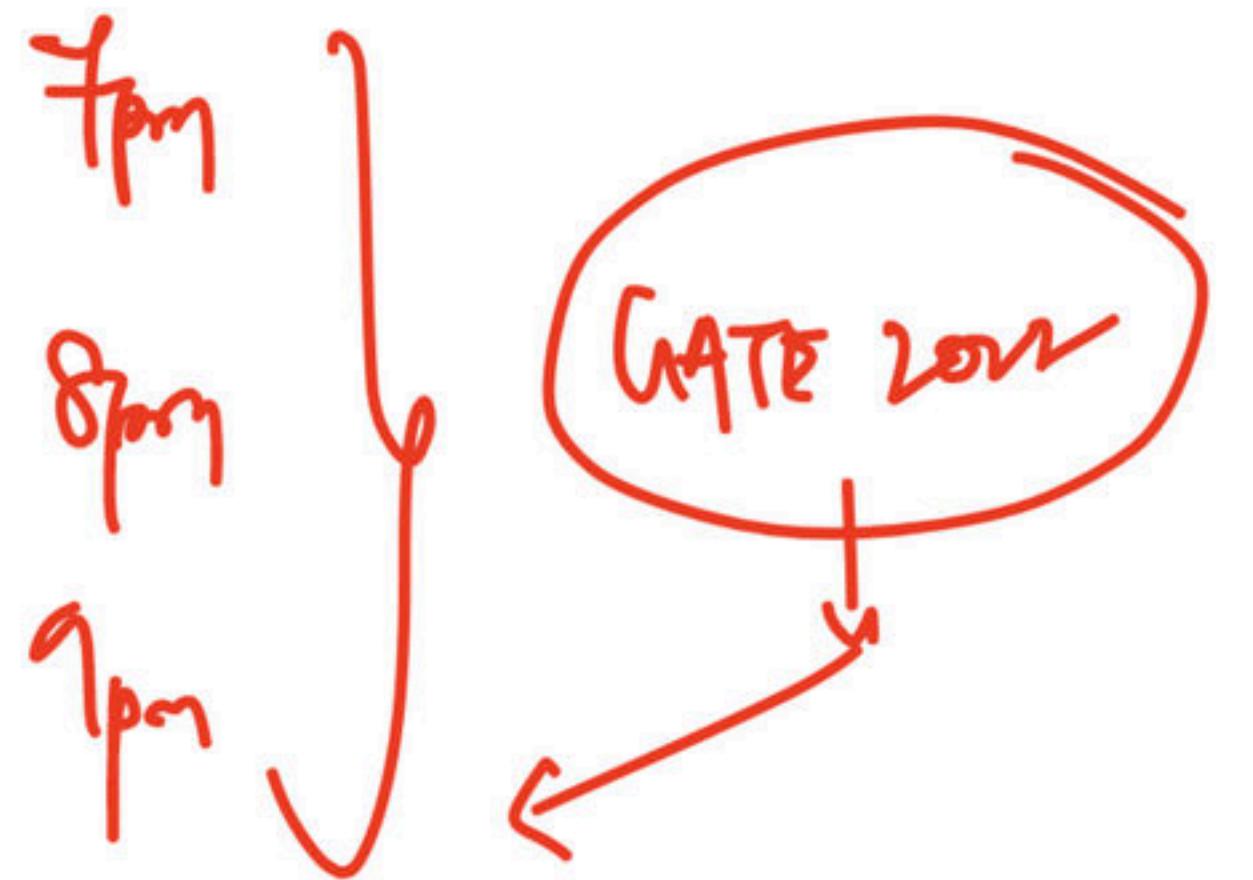
$$162 = 3^4 \times 2$$

$$3^4 \times 2 = \frac{3 \times 3 \times 3 \times 3 \times 2}{3^2 \times 3^2 \times 2^2} = 18^3$$

$$36 \downarrow$$

$$6 \times 6$$

$$3 \times 2 \quad \times \quad 3 \times 2$$



Dot Interpretation

# Answer

- Option D)



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Sep 21 - 27 • 5 lessons

SEP Translation of an Image - Part I

21 Lesson 1 • 10:30 PM

SEP Translation of an Image - Part II

22 Lesson 2 • 10:30 PM

SEP Translation of an Image - Part III

24 Lesson 3 • 10:30 PM



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Sep 21 - 27 • 5 lessons

SEP Introduction to Laplace Transforms

21 Lesson 1 • 2:00 PM

SEP Theorems of Laplace Transforms - Part I

22 Lesson 2 • 2:00 PM

SEP Theorems of Laplace Transforms - Part II

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**Thank you :)**

*See you in the next session :)*

# Answer

- Option A)



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Networks

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Aug 3 - 9 • 3 lessons

AUG Introduction to English Language and Grammar

4 Lesson 1 • 10:30 PM

AUG Tenses in English Language - Part I

6 Lesson 2 • 10:30 PM

AUG Tenses in English Language - Part II

8 Lesson 3 • 10:30 PM



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*See you in the next session :)*