Mensuration Questions for IBPS PO Prelims

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Questions

Instructions

Read the following information and answer the questions based on it.
The length ,breadth and height of a rectangular piece of wood in the 4cm,3cm, 5cm respectively
Opposite side of 5cm x 4 cm pieces are coloured in red colour
Oppsite sides 4cm x 3 cm ,are cloured in blue
Rest 5 cm x 3 cm are coloured in green in both sides
Now the piece is cut in such way that a cuboid of 1cm x 1cm x 1cm will be made

Question 1

How many cuboids shall have all the three colours?

A 8

B 10

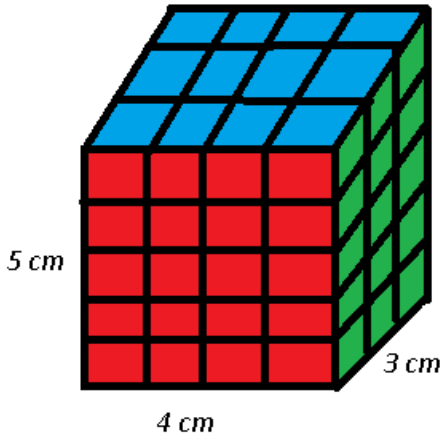
C 12

D 14

E None of these

Answer: A

Explanation:



The number of cuboid which will have all the three colours are the corner pieces.

Thus, 8 cuboids will have all the three colours.

=> Ans - (A)

Question 2

How many cuboids shall not any colour?

A No any

B 2

C 4

D 6

E None of these

Answer: D

Explanation:

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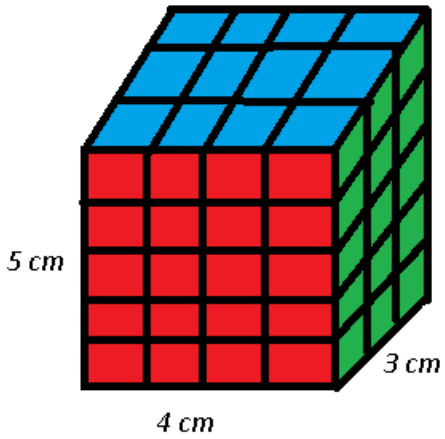


Number of cuboids which do not have any colour = $(5-2) \times (4-2) \times (3-2)$

= $3 \times 2 \times 1 = 6$

=> Ans - (D)

Question 3

How many cuboids shall have only two colours red and green in their two sides?

A 8

B 12

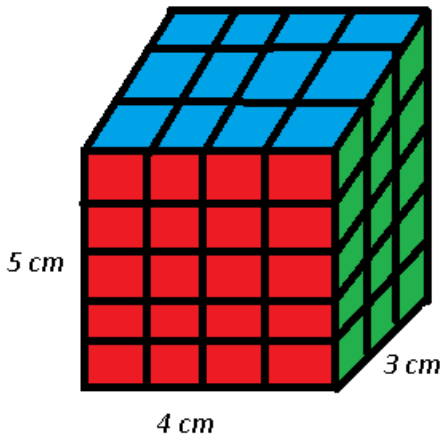
C 16

D 20

E None of these

Answer: B

Explanation:



Number of cuboids which have only two colours red and green in their two sides are the middle cuboids at the corner edges. There are 4 such edges which have combination of red and green colour.

Number of required cuboids = $(5-2) \times 4$

= $3 \times 4 = 12$

=> Ans - (B)

Question 4

How many cuboids shall have only one colour ?

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A 12

B 16

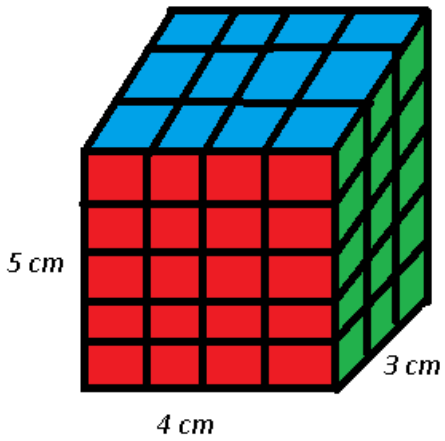
C 22

D 28

E None of these

Answer: E

Explanation:



Number of cuboids which have only 1 colour are the middle cuboids in all the faces. Also, there are 2 types of each faces.

2*(B-2)*(H-2)+2*(H-2)*(L-2).

=2*(4-2)*(3-2)+2*(3-2)*(5-2)+2*(5-2)*(4-2).

= 2*2*1 + 2*1*3 + 2*3*2.= 4 + 6 + 12.

=22.

Instructions

For the following questions answer them individually

Question 5

The sum of the radius and height of a cylinder is 42 cm. Its total surface area is 3696 cm 2. What is the volume of cylinder ?

A 17428 cubic cm

B 17248 cubic cm

C 17244 cubic cm

D 17444 cubic cm

E None of these

Answer: B

Explanation:

Total surface area of cylinder

=> $2\pi rh + 2\pi r^2 = 3696$

=> $2\pi r(r + h) = 3696$

$\because (r + h) = 42$ [Given]

=> $2 \times \frac{22}{7} \times r \times 42 = 3696$

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=> $44 \times 6 \times r = 3696$

=> $r = \frac{3696}{44 \times 6} = 14$ cm

=> $h = 42 - 14 = 28$ cm

$\therefore$ Volume of cylinder = $\pi r^2 h$

= $\frac{22}{7} \times 14 \times 14 \times 28$

= $17248 cm^3$

Question 6

The respective ratio of radii of two right circular cylinders (A and B) is 4 : 5. The respective ratioof volume of cylinders A and B is 12 : 25. What is the respective ratio of the heights of cylinders A and B ?

A 2 : 3

B 3 : 5

C 5 : 8

D 4 : 5

E 3 : 4

Answer: E

Explanation:
Volume of a cylinder = $\pi r^2 h$
where r and h are the radius and height of the cylinder respectively.
The ratio of volumes and ratio of radii of the two cylinders is given.
Ratio of square of their radii = 16 : 25
Therefore the ratio of their heights $h_1 : h_2 = 12 \times 25 : 16 \times 25$
where h_1 and h_2 are the heights of two cylinders.
the ratio of their heights = 12 : 16 = 3 : 4
Option E is the correct answer

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Question 7

The respective ratio of radii of two right circular cylinders (A and B) is 4 : 7. The respective ratio of the heights of cylinders A and B is 2 : 1. What is the respective ratio of volumes of cylinders A and B ?

A 25 : 42

B 23 : 42

C 32 : 49

D 30 : 49

E 36 : 49

Answer: C

Explanation:
Volume of a cylinder = $\pi r^2 h$
where r and h are the radius and height of the cylinder respectively.
The ratio of volumes of the two cylinders will be equal to the ratio of $r^2 h$ of both the cylinders..
For cylinder 1 $r^2 h = 4^2 \times 2 = 32$

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For cylinder 2 $r^2h = 7^2 \times 1 = 49$
Ratio of their volumes = $\frac{32}{49}$
Option C is the correct answer.

Question 8

The respective ratio of radii of two right circular cylinders (A and B) is 3 : 2. The respective ratio of volumes of cylinders A and B is 9 : 7, then what are the heights of cylinders A and B ?

A 8 : 5

B 4 : 7

C 7 : 6

D 5 : 4

E 6 : 5

Answer: B

Explanation:
Volume of a cylinder = $\pi r^2 h$
where r and h are radius and height of the cylinder respectively.
Let r_1 , h_1 , r_2 and h_2 be the radius and heights of the two cylinders respectively.
$\pi(r_1)^2h_1 : \pi(r_2)^2h_2$ = 9 : 7 ---------- 1
Ratio of radii $r_1 : r_2 = 3 : 2$
Ratio of square of radii = 9 : 4
Replacing the ratio of radii in 1
$9h_1 : 4h_2 = 9 : 7$
$h_1 : h_2 = (9 \times 4) : (7 \times 9) = 4 : 7$
Option B is the correct answer.

Question 9

If the volume and curved surface area of a cylinder are 616 m^3 and 352 m^2 respectively what is the total surface area of the cylinder (in m^2)

A 429

B 419

C 435

D 421

E 417

Answer: A

Explanation:
Volume of a cylinder=$\pi \times r^2 \times h$
where r and h are the radius and height of the cylinder.
$\pi \times r^2 \times h = 616m^3$
Curved Surface Area of Cylinder=$2 \times \pi \times r \times h$=$352m^2$
$\pi \times r \times h$=176
Replacing $\pi \times r \times h$ in Volume formula we get,
$r \times 176$=616
$r = 3.5m$
Total Surface Area = Curved Surface Area + 2 $\times$ Area of base
=$352 + 2 \times pi \times r^2$

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=$352 + 2 \times pi \times 3.5^2$
=$352 + 77$
=$429m^2$.
Hence Option A is the correct answer.

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Question 10

The sum of the radius and height of a cylinder is 18 metre. The total surface area of the cylinder is 792 sq. metre, what is the volume of the cylinder ? (in cubic metre)

A 1848

B 1440

C 1716

D 1724

E 1694

Answer: E

Explanation:
let the height and radius of cylinder be H mtr and R mtr

R + H = 18

total surface area of cylinder = $2\overline{\wedge}$RH + $2\overline{\wedge}(R)^2$ = 792

R(H + R) = $\frac{792x7}{22x2}$

R = 7 mtr

H = 18-7 = 11 mtr

volume = $\frac{22}{7}(R)^2(H)$

Volume = 1694 cubic mtr

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