Weekly Test Date: 12/11/2024

JINDAL SCHOOL (Explanation)

SECTION-A

1. If r is the radius of the sphere, then the volume of the sphere is given by $\frac{4}{3}\pi r^3$.

2. Two dice are thrown in the air.

Then sample space $(S) = \{(1,1), \ldots, (6,6)\}$

$n(S) = 6 \times 6 = 36$.

A = sum of dice is 3

$= \{(1,2), (2,1)\}$

$n(A) = 2$

$\therefore P(\text{getting sum is } 3) = P(A) = \frac{n(A)}{n(S)} = \frac{2}{36} = \frac{1}{18}$

3. Given $\bar{x} = 7.5$

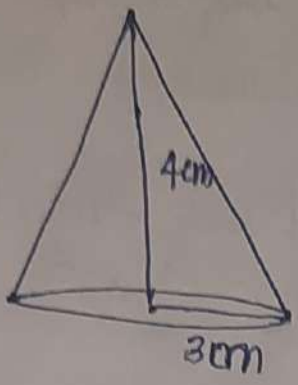
$\Sigma f_i x_i = 120 + 3K$ and $\Sigma f_i = 30$

So $\frac{\Sigma f_i x_i}{\Sigma f_i} = 7.5 \Rightarrow 120 + 3K = 30 \times 7.5 = 225$

$\Rightarrow 3K = 105$

$\Rightarrow \boxed{K = 35}$

4.



Here Base of radius (r) = 3cm
height of the cone (h) = 4cm

Then slant (l) = $\sqrt{h^2+r^2} = \sqrt{4^2+3^2}$

$\Rightarrow \boxed{l = 5}$

5. mean = 12 and mode = 15

Then 3 median = mode + 2mean

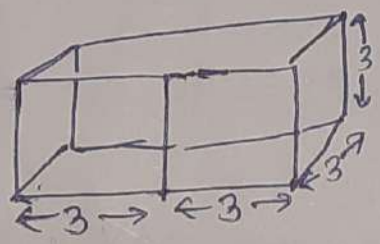
i.e. 3 median = $15 + 2 \times 12 = 39$

$\therefore$ $\boxed{\text{median} = 13}$

SECTION-B

6. Volume of cube = $27\ cm^3$

i.e., $a^3 = 27 \Rightarrow \boxed{a = 3}$



Here $l = 6$, $b = 3$ and
height (h) = 3

TSA of cuboid = $2[l \times b + b \times h + h \times l]$

$= 2(6 \times 3 + 3 \times 3 + 3 \times 6)$

$= 90$.

Hence surface area of the cuboid is $90\ cm^2$.

7. A bag contains 5 red, 4 green and 3 blue balls.

A ball is drawn at random.

$$P(\text{getting a red ball}) = \frac{n(\text{red ball})}{n(S)} = \frac{5}{12}$$

Hence getting a red ball is $5/12$.

SECTION-C

8. Let height of the cylinder $= (h)$
radius of the cylinder $= r$
Slant ~~latus~~ of the cylinder $= l$

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

Since $\frac{r}{h} = \frac{5}{12} \Rightarrow \boxed{h = \frac{12}{5}r}$

Volume of the cone $= 3.14\ cm^3$

$$\Rightarrow \frac{1}{3}\pi r^2 h = \pi \Rightarrow \frac{1}{3}r^2 \frac{12}{5}r = 1$$

$$\Rightarrow \boxed{r = \left(\frac{5}{4}\right)^{1/3}}$$

$$\therefore l = \sqrt{h^2 + r^2} = \frac{13}{5}r$$

$\therefore$ TSA of the cone $= \pi r l$

$= \pi r \frac{13}{5} r$

$= \frac{13}{5} \pi \left(\frac{5}{4}\right)^{2/3}$

9. A bag contains a black ball, a red ball, and a green ball

A ball takes out from the bag

then P(ball is a green Ball) = $\frac{1}{3}$

P(ball is a red Ball) = $1/3$

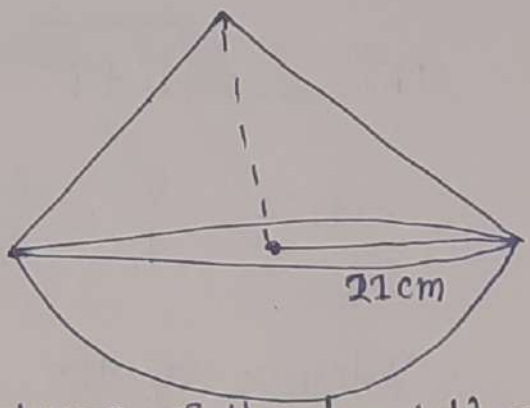
P(ball is a Black Ball) = $1/3$

SECTION-D

10.

Given radius of the cone and hemisphere is

$r = 21$ cm



Volume of cone $\frac{2}{3}$ of the volume of the hemisphere

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

$\Rightarrow h = \frac{4}{3} r$ and ~~h = 42 cm~~

$h = \frac{4}{3} \times 21 = 28$ cm

$l = \sqrt{h^2 + r^2} = \sqrt{\frac{16}{9} r^2 + r^2} = \frac{5}{3} r$

(a) TSA = Surface area of cone + Surface area of hemisphe

$= \pi r l + 2\pi r^2$

$= \pi r [l + 2r]$

$= \frac{22}{7} \times r \times \left(\frac{5}{3}r + 2r\right)$

$= \frac{22}{7} \times r^2 \times \frac{11}{3} = \frac{22}{7} \times \frac{11}{3} \times 21 \times 21$

$= 22 \times 11 \times 21 = 5082 \text{ cm}^2$

Hence total surface is 5082 cm^2 & height of the cone is 28 cm.