Assignment-1

AI1110: Probability And Random Variables
IIT Hyderabad

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Q7(b) The model of a building is constructed with the scale factor 1:30.

(i) If the height of the model is 80 cm, find the actual height of the building in meters.

(ii) If the actual volume of the tank at the top of the building is $27m^3$,find the volume of the tank at the top of the model.

Solution:-
(i) Given height of model building = 80cm
Also the given scale factor is 1:30

$$1:30 = h_1 : h_2 \tag{1}$$
$$\frac{1}{30} = \frac{h_1}{h_2} \tag{2}$$
$$h_2 = h_1 \times 30 \tag{3}$$
$$h_2 = 80 \times 30 \tag{4}$$

Actual height = 2400 cm.

(ii) Actual volume of $tank = 27m^3$
and given scale factor is $1:30$

$$\frac{1}{30} = \frac{h_1}{h_2} \tag{5}$$
$$\frac{1}{30} = \frac{w_1}{w_2} \tag{6}$$
$$\frac{1}{30} = \frac{l_1}{l_2} \tag{7}$$

As we know that,

$$volume = l \times w \times h \tag{8}$$

So,

$$\frac{1}{30 \times 30 \times 30} = \frac{V_1}{V_2} \tag{9}$$
$$V_1 = \frac{V_2}{27000} \tag{10}$$
$$V_1 = \frac{27}{27000} = 0.001m^3 \tag{11}$$

on converting it into centimeter square = 0.001×10^6
volume of model tank $= 1000cm^3$