SCALES

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Abstract

A system of measurement for something that doesn't seem like it could be measured in discrete units in the first place. Almost always used for humor. Second place are secondary divisions. Metric measurements and various types of scales considered in the engineering sector for multiple tasks. Standard scales are constructed based on SF.

INTRODUCTION

SCALE is defined as the ratio of the length of line on the drawing to the maximum length (actual length of edge on the object.

Scale or

$$S.F = \frac{LENGTH\ OF\ LINE\ IN\ THE\ DRAWING}{MAXIMUM\ \ LENGTH}$$

SCALE 1:1 for full size scale
SCALE 1: P for reduced scale (P>1)
SCALE P : 1 for enlarged scale (P >1)

METRIC MEASUREMENTS

10 mm = 1cm (CENTIMETRE)
10 cm = 1dm (DECIMETRE)
10 dm = 1m (METRE)
10 m = 1 dam (DECAMETRE)
10 dam= 1hm (HECTOMETRE)

UNITS

12 inches = 1feet
3 feet = 1 yard
9 sft =1 Syard (square yard)
1089 sft = 1 Guntha
121 syd = 1 guntha
43560 sft = 1 Acre
4840 syd = 1 Acre

TYPES OF SCALES

1. Plain scale 2. Diagonal Scale
3. Vernier Scale etc.,

PLAIN SCALE

Plain scale is used to show either **two units** or **a unit** and its fraction.

e.g: (i) Km – hm
(ii) m-dm
(iii) dm-cm
(iv) cm-mm etc

Problems

1. Construct a scale of 2cm = 1 decimeter, to read up to 1 m and show on it a length of 0.66 m.

sol: <u>GIVEN</u> :

SCALE 2 cm = 1 dm
Maximum length = 1m

SCALE 2cm = 1dm or 20 mm =100mm

$$S.F = \frac{20\ mm}{100\ mm}$$

$$S.F = \frac{1}{5}$$

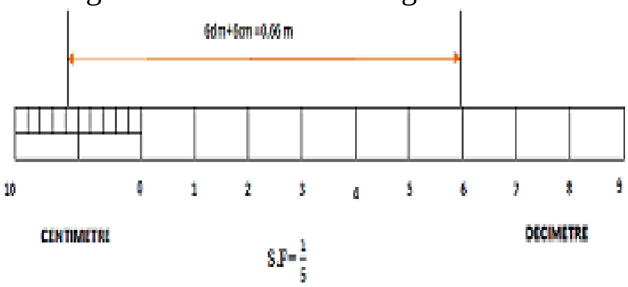
we know that,

$$S.F = \frac{LENGTH\ OF\ LINE\ IN\ THE\ DRAWING\ (LOLD)}{MAXIMUM\ \ LENTH\ (ML)}$$

$$LOLD = S.F \times ML$$

$$LOLD = \frac{1}{5} X1000$$

∴ Length of line on the drawing = 200 mm



1. Draw a 200 mm long line. Divide it into 10 equal parts; each part representing 1 dm.
2. Mark 0 after the first division and continue 1,2,3, etc., to the right of the scale.
3. Divide the first division in to 10 equal parts; each part showing 1 cm.
4. Mark the secondary divisions from right to left.
5. Write Units at the bottom of the scale in respective positions and also the S.F
6 Mark the distance 0.66m (selecting 6 primary and 6 secondary divisions)

2. Construct a scale to be used with a map, the scale of which is 1cm = 4 m. The scale should read in meters, up to 60 m. Show on it a distance of 46 m.

sol: **GIVEN :**

SCALE 1 cm = 4 m

Maximum length = 60m

SCALE 1cm = 4 m or 10 mm =4000mm

S.F $=\frac{10\ mm}{4000\ mm}$

S.F= $\frac{1}{400}$

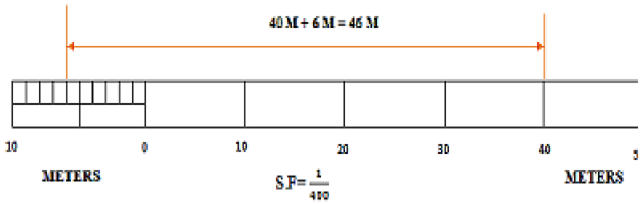
we know that,

S.F=$\frac{LENGTH\ OF\ LINE\ IN\ THE\ DRAWING\ (LOLD)}{MAXIMUM\ \ LENTH\ (ML)}$

LOLD =S.F X ML

LOLD= $\frac{1}{400}X60000$

$\therefore$ Length of line on the drawing = 150 mm



1. Draw a 150 mm long line. Divide it into 6 equal parts; each part representing 10 m.
2. Mark 0 after the first division and continue 10,20,30, etc., to the right of the scale.
3. Divide the first division in to 10 equal parts; each part showing 1 m.
4. Mark the secondary divisions from right to left.
5. Write Units at the bottom of the scale in respective positions and also the S.F
6. Mark the distance 46m (selecting 4 primary and 6 secondary divisions)

3. Construct a scale of 1:8 to show decimeters and centimeters and to read up to 1m. show a length of 7.6 dm on it.

sol: **GIVEN :**

SCALE 1:8

Maximum length = 1m

Maximum length = 1m =100 cm

Maximum length = 1m =1000mm

S.F= $\frac{1}{8}$

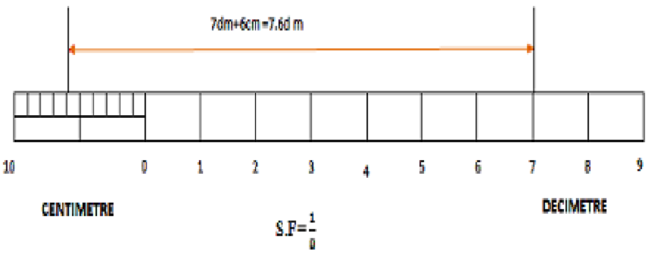
we know that,

S.F=$\frac{LENGTH\ OF\ LINE\ IN\ THE\ DRAWING\ (LOLD)}{MAXIMUM\ \ LENTH\ (ML)}$

LOLD =S.F X ML

LOLD= $\frac{1}{8}X1000$

$\therefore$ Length of line on the drawing = 125 mm



1. Draw a 125 mm long line. Divide it into 10 equal parts; each part representing 10 m.
2. Mark 0 after the first division and continue 1,2,3, etc., to the right of the scale.
3. Divide the first division in to 10 equal parts; each part showing 1 cm.
4. Mark the secondary divisions from right to left.
5. Write Units at the bottom of the scale in respective positions and also the S.F
6. Mark the distance 7.6dm (selecting 7 primary and 6 secondary divisions)

CONCLUSION

Thus we conclude the system of measurement for something that doesn't seem like it could be measured in yard-feet etc units in the first place. Based on scale factor simplified the plain scale drawings that could be used in the stream of engineering especially for mechanical and civil aspects.

REFRENCES

[1]. Engineering Drawing text book by K L Narayana.
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[3]. Engineering Drawing text by N. D Bhatt