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Mid Term

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Sec : B

Subject : Quantity Survey & Estimation

Submitted to :

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(2)

Q No 1

1) Determine the quantities of various materials to prepare 100 CFT concrete if the ratio is (1:4:8)? Also calculate a brick work of 75 CFT and ratio for that is given (1:4). Calculate No. of bricks, Dry volume of quantities of mortar?

Sol:-

Given that

Quantity of wet material = 100 cft

Dry density of concrete = 1.54

⇒ Quantity of Dry material = 100×1.54
= 154 CFT.

Ratio of concrete = 1:4:8 (Given)

Sum of ratio = $1+4+8 = 13$

Quantity of cement = $\frac{\text{Ratio of cement}}{\text{Sum of ratio}} \times \text{Dry materials}$

Putting values in above equation
= $\frac{1}{13} \times 154 = 11.78 \text{ CFT}$

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OR

$$= 11.78 / 1.25 = 9.42 \text{ bags of cement}$$

A) Quantity of Sand = $\frac{\text{Ratio of Sand}}{\text{Sum of ratio}} \times \text{dry mat. extd}$

$$= \frac{4}{13} \times 154 = 47.12 \text{ CFT}$$

A Quantity of coarse aggregate:-

$$= \frac{\text{Ratio of coarse aggregate}}{\text{Sum of ratio}} \times \text{Dry material}$$

$$= \frac{8}{13} \times 154 = 94.24 \text{ CFT}$$

A Brick Portion:-

Sol:-

Size of Brick = $9'' \times 4.5'' \times 3''$

Volume of Brick = 121.5 Inch^3

Volume of Brick wall = 75 ft^3

No of Bricks without Mortar,

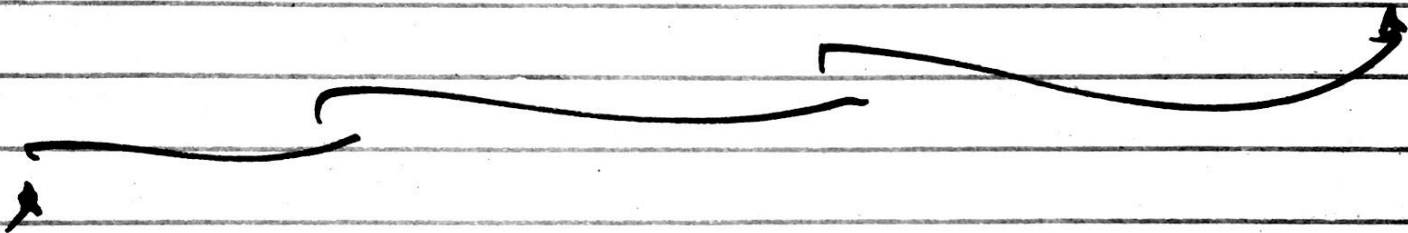
$$= \frac{75}{\left(\frac{121.5}{(12)^3}\right)}$$

$$\therefore \frac{121.5 \text{ Inch}^3 \text{ to feet}^3}{(12)^3}$$

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$$= \frac{75}{0.070^3}$$

No of Brides = 1066.85 or 1067



Q. 20
R

Dry and wet volume of concrete.

is the Dry Volume of concrete of cement, fine aggregates and coarse agg in dry condition.

After mixing the resultant wet volume turns out to be approximately 60-70% of the dry volume for estimation purpose dry volume of concrete can be taken as 1.54 of its wet volume.

$$\text{For concrete } 1\text{m}^3 = 54\% \\ \text{Dry volume} = \text{wet volume} + 54\% \\ \text{of wet volume}$$

$$= 1 + \left(\frac{54}{100} \times 1 \right)$$

$$= 1 + 0.54$$

$$\text{Dry volume} = 1.54$$

Dry & wet volume of mortar:-

When water is added to the dry mix of cement sand the volume of dry mix is reduced it happens due to the presence of air voids in sand particles.

When we calculate the another quantity for any masonry work, we get the wet volume of mortar. If we want to calculate the required volume of sand & cement we need to convert that wet volume into the dry volume.

For estimation purpose dry volume of mortar can be taken 1.27 & 1.54 times of its wet volume.

For cement mortar 1m^3

$$= 27\% \text{ or } 54\%$$

$$\text{Dry volume} = \text{Wet volume} + 27\% \text{ or } \text{Wet volume}$$

$$= 1 + \left(\frac{27}{100} + 1 \right)$$

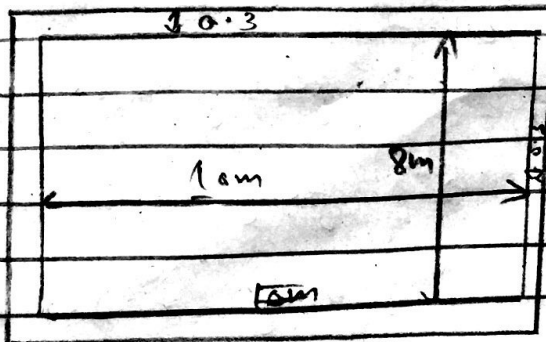
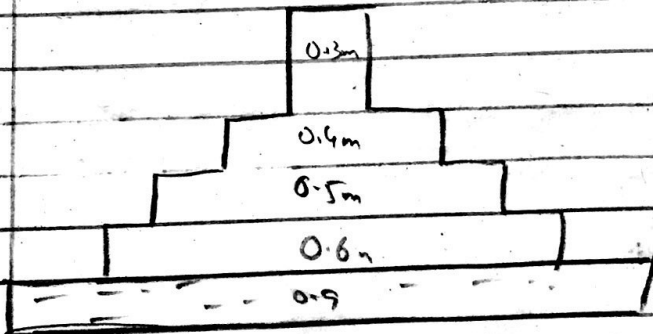
$$= 1 + 0.27$$

$$\text{Volume} = 1.27$$

Q No:2

Calculate

wall method?



$$L/w = 10 + 0.3 + 0.3 = 10.6$$

$$S/w = 8m$$

Excavation:

$$L/w = 2 \times 10.6 \times 0.9 \times 1.5 = 28.62m^3$$

$$S/w = 2 \times 8 \times 0.9 \times 1.5 = 21.6m^3$$

$$\text{Total Excavation} = 28.62 + 21.6$$

Total Excavation = 50.22m ³
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Concrete Work:

$$L/w = 2 \times 10.6 \times 0.9 \times 0.3 = 5.724m^3$$

$$S/w = 2 \times 8 \times 0.9 \times 0.3 = 4.32m^3$$

Total Concrete Work: 10.044m ³

Brick Wall:

L/w

$$1^{st} \text{ footing} = 2 \times 10.6 \times 0.6 \times 0.3 = 3.816m^3$$

$$2^{nd} \text{ footing} = 2 \times 10.6 \times 0.5 \times 0.3 = 3.18m^3$$

$$3^{rd} \text{ footing} = 2 \times 10.6 \times 0.4 \times 0.6 = 5.088m^3$$

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Brick wall above G.L

$$= 2 \times 10.6 \times 0.3 \times 3.5 = 22.26 \text{ m}^3$$

Total L/w Brick

$$\text{Work} = 34.344 \text{ m}^3$$

S/w

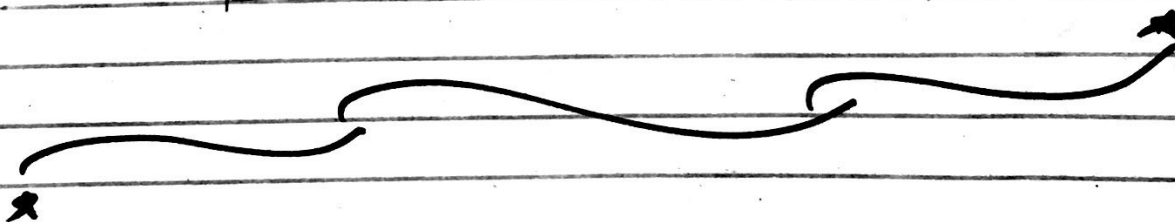
$$1^{\text{st}} \text{ footing} = 2 \times 8 \times 0.6 \times 0.3 = 2.88 \text{ m}^3$$

$$2^{\text{nd}} \text{ footing} = 2 \times 8 \times 0.5 \times 0.3 = 2.4 \text{ m}^3$$

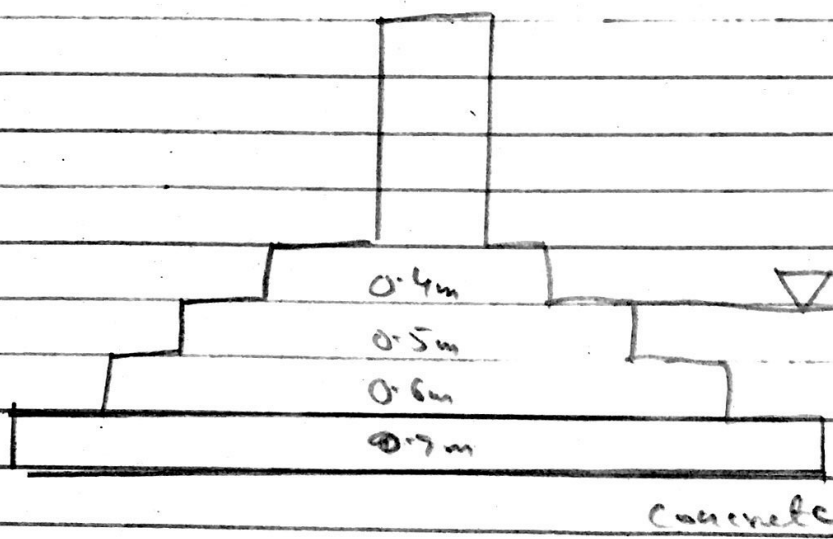
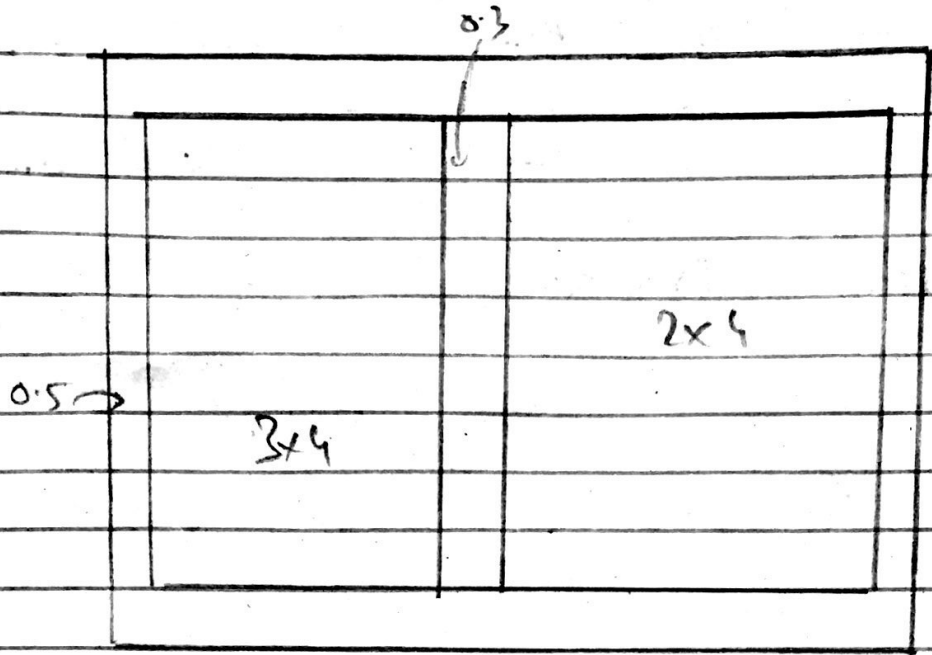
$$3^{\text{rd}} \text{ footing} = 2 \times 8 \times 0.4 \times 0.6 = 3.84 \text{ m}^3$$

$$\text{Above G.L wall} = 2 \times 8 \times 0.3 \times 3.5 = 16.8 \text{ m}^3$$

Total S/w = 16.8 cum



Q No 3



$$V = 0.15 + 4 + 0.15 = 4.3$$

$$EV = 3 \times 4.3 = 12.9$$

$$H = 0.15 + 3 + 0.3 + 2 + 0.15 = 5.6$$

$$EN = 2 \times 5.6 = 11.2$$

Center line length

$$= 11.2 + 12.9$$

$$= 24.8$$

Excavation:

$$L = 24.8 - 0.9 = 23.9$$

So

$$1 \times 23.9 \times 0.9 \times 0.5 = 10.755 \text{ m}^3$$

Concrete

$$1 \times 23.9 \times 0.9 \times 0.1 = 2.151 \text{ m}^3$$

Brick Work

$$\begin{aligned} 1^{\text{st}} \text{ footing} &= 1 \times 24.2 \times 0.6 \times 0.2 \\ &= 2.904 \text{ m}^3 \end{aligned}$$

$$\begin{aligned} 2^{\text{nd}} \text{ footing} &= 1 \times 24.3 \times 0.5 \times 0.2 \\ &= 2.43 \text{ m}^3 \end{aligned}$$

$$\begin{aligned} 3^{\text{rd}} \text{ footing} &= 1 \times 24.4 \times 0.4 \times 0.2 \\ &= 1.952 \text{ m}^3 \end{aligned}$$

$$\begin{aligned} \text{Brick wall} &= 1 \times 24.5 \times 0.3 \times 0.6 \\ &= 4.41 \text{ m}^3 \end{aligned}$$

