

Revision 2015

Course Code 5014

Course Title: - Quantity Surveying II.

Qst No	Scoring indicator	Split up Score	Sub Total	Total.
	<u>PART A</u> (Max mark 10)			
I i)	0.56 s, when s is the eave span	2+1	2	
I ii)	When the linear water way is upto 6m, it is a culvert and those with linear water way above 6m, are classified as Bridges.	1+1	2	
I iii)	a) General/ Brief Specifications and b) Detailed Specification	1+1	2	
I iv)	The fund which is gradually accumulated for the sole purpose of replacement or reconstruction of the building or structure at the end of its useful life.	2	2	
I v)	Value means its worth or utility. Value varies time to time and depends largely on the supply of that particular type of property and the extent of the demand for it.	2	2	10
	<u>PART B</u> (Max mark 30)			
	Answer any five questions (5x6=30)			
II i)	R.C.C. work for 1:2:4 in cover slab. $1 \times 4.60 \times 3.00 \times 0.15 = 2.07m^3$ Say <u>2.1m³</u> L x b x h — 1 — 2. b — 2 Ans 2.	2+2+2	6	

II	ii)	Brick masonry in cement mortar 1:4, for the walls		
		Long walls $2 \times 4.60 \times 0.30 \times 3 = 8.28$	2	
		Short walls $2 \times 2.40 \times 0.30 \times 3 = 4.32$	2	
		<u>12.6 m³</u>	2	
		<u>07</u>		
		$\%c = (4.3 + 2.7) 2 \times 0.30 \times 3 = 12.6 m^3$		6

II	iii)	R.C.C work 1:2:4 for cantilever retaining wall		
		Base slab $1 \times 30.00 \times 3.00 \times 0.150 = 45.00$	2	
		Stems $1 \times 30.00 \times \frac{0.6+0.2}{2} \times 6.00 = 72.00$	2	
		Total = <u>117.00 m³</u>	2	6

II	iv)	Brickwork in 1:4 Cement mortar		
		Abutments $2 \times 4.80 \times 0.40 \times 1.50 = 5.76$	2	
		Wing walls $4 \times 1.20 \times 0.40 \times 1.50 = 2.88$	2	
		<u>8.64 m³</u>	2	6

II v) Specifications for plastering with cement mortar

The joints of brickwork shall be raked, washed and kept before plastering. Materials should be dry as standard specifications. The mortar materials should be dry mixed, first and then water added slowly to get a through mix.

The thickness of plastering shall be as specified and applied in one or two coats. First mortar shall be dashed and pressed over the surface.

by means of float and trowel.

Plastering shall be started from top and worked down. The plastered surfaces shall be kept wet for 10 days. The surface should be protected from rain, sun, etc.

6x1 6.

II vi) Methods of calculating depreciation

- a. Straight line method.
- b. Constant percentage method or declining balance method
- c. Sinking fund method.
- d. Annuity sum method.

$H \times \frac{1}{2} = 2.$

a) Straight line method.

In this method the property is assumed to lose value by a constant amount every year and thus a fixed amount of original cost is written off every year so that at the end of the term when the asset is worn out, only the scrap value remains.

Let C = original cost S_c Scrap value
 n = life of the property in years
 D = Annual depreciation by straight line method.

$$\text{Annual depreciation} = \frac{\text{Original cost} - \text{Scrap value}}{\text{Life in years}}$$

$$D = \frac{C - S_c}{n}$$

b) Constant percentage method or declining balance method.

In this method the property is assumed to lose value annually at a constant percentage of its value. (or book value)

Let P = Percentage rate of annual depreciation for the constant percentage method expressed in decimal.

C = original cost S_c = Scrap value

n = Life of the property in years.

The end of 'n' years value of the property becomes ultimately the scrap value.

$$S_c = C(1-P)^n.$$

$$\text{OR } P = 1 - \left(\frac{S_c}{C}\right)^{1/n}$$

The above formula does not hold good when the scrap value, S_c is zero.

c) Sinking fund method

In this method the depreciation is assumed to be annual sinking fund plus the interest of the accumulated sinking fund till that year.

Annual sinking fund to provide for Rs 1/- in n years = $\frac{i}{(1+i)^n - 1} - x$.

When i = rate of interest expressed in decimal at which sinking fund account is required to be invested.

* An amount of Rs 1/- per annum in 'n' years = $(1+i)^n - 1 = y$.

Rate of depreciation in 'n' years = x/y .

	<p>d) <u>Quasi-survey method</u>.</p> <p>In this method the property is studied in details and extent of physical deteriorations worked out in an endeavour to calculate depreciation.</p>	2x2=4	6																	
<p>II vii)</p>	<p><u>Purpose of valuation</u></p> <ol style="list-style-type: none"> 1) Purchase for investment or for occupation. 2) Tax fixation. 3) Sale. 4) Rent fixation. 5) Insurance premiums. 6) Security of loans or mortgage value. 7) Compulsory acquisitions. 8) Speculation 9) Betterment charges. 10) wealth tax and estate duty 11) Gift tax (12) Probate (13) Partition. 14) Assessment of income or stamp duties. 15) Capital gains tax. 	6x1=6	6	42																
<p>III</p>	<p style="text-align: center;"><u>UNIT I</u> <u>PART C</u></p> <p>a) Brickwork in cm 1:6 for superstructure.</p> <table border="0" style="width: 100%;"> <tr> <td style="padding-right: 20px;">outer wall</td> <td>1 x 33.60 x 0.20 x 2.70 = 18.14</td> </tr> <tr> <td>Long cross wall</td> <td>1 x 10.20 x 0.20 x 3.00 = 6.12</td> </tr> <tr> <td>Short cross wall</td> <td>4 x 3.00 x 0.20 x 2.85 = 6.84</td> </tr> <tr> <td>Cross wall w/c</td> <td>1 x 2.00 x 0.20 x 2.85 = 1.14</td> </tr> <tr> <td>Parapet outer ^{sun} side</td> <td>1 x 38.00 x 0.10 x 0.10 = 0.38</td> </tr> <tr> <td>Parapet roof</td> <td>1 x 35.20 x 0.10 x 0.30 = 1.06</td> </tr> <tr> <td>Chimney, sidewall</td> <td>1 x 1.00 x 0.20 x 2.85 = 0.57</td> </tr> <tr> <td style="padding-left: 40px;">Top</td> <td>1 x 5.20 x 0.20 x 1.20 = 1.25</td> </tr> </table>	outer wall	1 x 33.60 x 0.20 x 2.70 = 18.14	Long cross wall	1 x 10.20 x 0.20 x 3.00 = 6.12	Short cross wall	4 x 3.00 x 0.20 x 2.85 = 6.84	Cross wall w/c	1 x 2.00 x 0.20 x 2.85 = 1.14	Parapet outer ^{sun} side	1 x 38.00 x 0.10 x 0.10 = 0.38	Parapet roof	1 x 35.20 x 0.10 x 0.30 = 1.06	Chimney, sidewall	1 x 1.00 x 0.20 x 2.85 = 0.57	Top	1 x 5.20 x 0.20 x 1.20 = 1.25			
outer wall	1 x 33.60 x 0.20 x 2.70 = 18.14																			
Long cross wall	1 x 10.20 x 0.20 x 3.00 = 6.12																			
Short cross wall	4 x 3.00 x 0.20 x 2.85 = 6.84																			
Cross wall w/c	1 x 2.00 x 0.20 x 2.85 = 1.14																			
Parapet outer ^{sun} side	1 x 38.00 x 0.10 x 0.10 = 0.38																			
Parapet roof	1 x 35.20 x 0.10 x 0.30 = 1.06																			
Chimney, sidewall	1 x 1.00 x 0.20 x 2.85 = 0.57																			
Top	1 x 5.20 x 0.20 x 1.20 = 1.25																			

Steps footing	$2 \times 1.80 \times 0.60 \times 0.15 = 0.32$
□ footing	$2 \times 1.20 \times 0.30 \times 0.15 = 0.32$
Total	<u><u>36.14 m³</u></u>

Deduction for openings

Doors	D	$5 \times 1.00 \times 0.20 \times 2.10 = 2.10$
	D ₁	$1 \times 0.80 \times 0.20 \times 2.10 = 0.34$
Windows	W	$4 \times 1.50 \times 0.20 \times 1.50 = 1.80$
	W ₁	$3 \times 1.00 \times 0.20 \times 1.50 = 0.90$
Ventilators	V	$1 \times 1.00 \times 0.20 \times 0.50 = 0.10$
Setout		$1 \times 2.60 \times 0.20 \times 2.10 = 1.00$
		$1 \times 1.40 \times 0.20 \times 2.10 = 0.59$
Contd outer wall		$1 \times 33.60 \times 0.20 \times 0.15 = 1.01$
Long cross wall		$1 \times 10.20 \times 0.20 \times 0.15 = 0.31$
Short cross wall		$4 \times 3.00 \times 0.20 \times 0.15 = 0.36$
Cross wall w/c		$1 \times 1.80 \times 0.2 \times 0.15 = 0.05$
Beams		$1 \times 5.60 \times 0.2 \times 0.15 = 0.17$
Total		<u><u>8.82 m³</u></u>

Net brick masonry = 27.32 m³

8 8

ii

(b) Supplying and fixing frame works for doors, windows and ventilators.

Horizontals	D	$5 \times 1.20 \times 0.10 \times 0.08 = 0.05$
	D ₁	$1 \times 1.00 \times 0.10 \times 0.08 = 0.01$
	W	$(4 \times 2) \times 1.70 \times 0.10 \times 0.07 = 0.10$
	W ₁	$(3 \times 2) \times 1.20 \times 0.10 \times 0.07 = 0.05$

	V	(1x2) x 1.20 x 0.10 x 0.07 = 0.02			
Verticals	D	(5x2) x 2.15 x 0.10 x 0.08 = 0.17			
	D ₁	(1x2) x 2.15 x 0.10 x 0.08 = 0.03			
	W	(4x4) x 1.50 x 0.10 x 0.07 = 0.17			
	W ₁	(3x3) x 1.50 x 0.10 x 0.07 = 0.09			
	V	(1x3) x 0.50 x 0.10 x 0.07 = 0.01			
		Total	<u>0.70 m³</u>	7	7

OR

IV a) Plastering inside and outside of walls with CM 1:5.

Drawing cum Dining room

1 x 20.00 x 2.85 = 57.00

Bedroom and kitchen

3 x 12.00 x 2.85 = 102.60

Latrine 1 x 7.20 x 2.85 = 20.52

Corridor 1 x 4.20 x 2.85 = 11.97

Setout 1 x 9.60 x 2.85 = 27.36

Chimney sidewall 1 x 2.20 x 2.85 = 6.27

inside 1 x 4.40 x 1.20 = 5.28

outside 1 x 6.00 x 1.20 = 7.20

Outer face of wall 1 x 34.40 x 2.85 = 98.04

parapet sunshade 1 x 38.00 x 0.40 = 15.20

Roof 1 x 35.20 x 0.80 = 28.16

Steps, top 2 x 1.80 x 0.60 = 2.16

Front 2 x 1.80 x 0.30 = 1.08

Steps 4 x 0.60 x 0.30 = 10.72

Total 388.56 m²

Deductions

Opening at sitout	$2 \times 2.80 \times 2.10 = 11.76$
	$2 \times 1.60 \times 2.10 = 6.72$
D	$5 \times 1.00 \times 2.10 = 10.50$
D ₁	$1 \times 0.80 \times 2.10 = 1.68$
W	$4 \times 1.50 \times 1.50 = 9.00$
V	$1 \times 1.00 \times 0.50 = 0.50$
Total deductions	<u>40.16 m^2</u>

Area of plastering = $383.56 - 40.16$
 $= \underline{\underline{343.40 \text{ m}^2}}$ 8 8

IV

(b) R.C.C 1:2:4 for roof slab and Sunshade.

Roof slab	$1 \times 10.90 \times 6.90 \times 0.10 = 7.52$ <u>7.52 m^3</u>
Sunshade	$1 \times 36.20 \times 0.45 \times 0.075 = 1.22$ <u>1.22 m^3</u>

7 7 15

UNIT II

V(a) Steel bars including bending in reinforcement for Stems

Right side.

22mm dia bars :-

22mm dia main bars @ 40cm

c/c full height

$76 \times 7.53 = 572.28 \text{ m}$

No = $\frac{30 - \text{Covers}}{0.40} + 1 = 76 \text{ Nos}$

22mm dia main bars upto 3.1m ht

@ 40 cm c/c.

$75 \times 5.13 = 384.75 \text{ m}$

No = $\frac{29.90 - 2 \times 0.20}{40} + 1 = 75 \text{ Nos}$

22mm dia main bars up to 1.8m ht.
@ 20cm c/c. (in main ring bars)

$$150 \times 3.33 = 499.5$$

$$\text{No} = \frac{29.90 - 2 \times 0.10}{0.20} + 1 = 150 \text{ Nos.}$$

Total of 22mm dia bars.

$$1456.53 \text{ m}$$

$$\text{@ } 2.98 \text{ kg} = \underline{\underline{4340.46 \text{ kg}}}$$

14mm dia bars.

14mm dia distributing bars
right side of stems @ 25cm c/c.

$$\text{No} = \frac{6.50 - 0.05 - 0.07}{0.25} + 1 = 27 \text{ Nos.}$$

$$27 \times 31.52 = 851.04$$

14mm dia vertical bars

left side of stems @ 30cm c/c

$$\text{No} = \frac{30 - 10}{0.30} + 1 = 101 \text{ Nos. } 101 \times 6.63 = \underline{\underline{669.63 \text{ m}}}$$

$$\text{Total } 1520.67 \text{ m.}$$

$$1520.67 \text{ @ } 1.21 \text{ kg} = \underline{\underline{1840 \text{ kg}}}$$

10mm dia bars.

10mm dia distributing bars.

left side stems @ 30cm c/c.

$$\text{No} = \frac{6.5 - 0.05 - 0.07}{0.3} + 1 = 22 \text{ Nos.}$$

$$22 \times 31.06 = 687.28 \text{ m}$$

$$687.28 \text{ @ } 0.62 = \underline{\underline{426.11 \text{ kg}}}$$

8

8

V

(b) Base slab

10mm dia distribution bars at bottom (Toe) @ 25c/c.

$$No = \frac{(0.75 + 0.6 + 0.3) - 0.05}{0.25} + 1$$

$$7 \times 31.06 = 217.42m$$

10mm dia distribution bars at top (heel) @ 20mm/c.

$$No = \frac{(1.56 + 0.60 + 0.25)}{0.20} + 1 = 13 Nos$$

$$13 \times 31.06 = 403.78$$

Total $\underline{621.2m}$

$$621.2 @ 0.62 = \underline{385.14kg}$$

16mm dia bars

16mm dia main bars at bottom (Toe) @ 15cm/c.

$$No = \frac{30 - 0.10}{0.15} + 1 = 200$$

$$200 \times 1.89 = 378m$$

16mm dia main bars at top (heel) @ 10cm/c.

16mm dia main bars at top (heel) @ 10cm/c.

$$No = \frac{30 - 0.10}{0.10} + 1 = 300 Nos$$

$$300 \times 2.74 = 822$$

Total $\underline{\underline{1200m}}$

$$1200 @ 1.58 = \underline{\underline{1896kg}}$$

7 7 15

OR

VI
(a)

Earthwork excavation in foundation

Abutments $2 \times 5.10 \times 0.70 \times 0.60 = 4.28$

Wing walls $4 \times 1.20 \times 0.70 \times 0.60 = 2.02$

Total $\underline{\underline{6.30m^3}}$ $4+4$
8

VI
(b)

Cement concrete 1:8:6 in foundation.

Abutments $2 \times 5.10 \times 0.70 \times 0.30 = 2.14$

Wing walls $4 \times 1.20 \times 0.70 \times 0.30 = 1.01$

Total $\underline{\underline{3.15m^3}}$ $3\frac{1}{2} \times 2$ 7 15

VII

UNIT III

a) 1) R.C.C work 1:2:4
excluding steel and
its binding but
including centering
and shuttering and
binding steel.

$$1 \times 6.30 \times 3.30 \times 0.12 = 2.495$$

$\underline{\underline{2.495m^3}}$

2) Steel bars including
binding (mild steel)
in R.C.C work.

Main bars 12mm dia
@ 0.89kg/m.

Straight bar 24mm/c.

$$No = \frac{6.30 - 0.08}{0.24} + 1$$

$$= 27$$

$$27 \times 3.44 = 92.88$$

$$26 \times 3.52 = \frac{91.52}{184.40m}$$

Bar step bars
 $No = \frac{6.30 - 0.08}{0.24} = 26$

$$184 @ 0.89 = \underline{\underline{164.12kg}}$$

Distribution bars 6mm dia @ 0.22kg/m.

Bottom bars Central portion 18cm/c.

No = $\frac{2.100}{0.18} + 1 = 12$ $12 \times 6.33 = 75.96$

Bottom bars two side $2 \times 3 \times 6.33 = 37.98$

Top bars two sides $2 \times 3 \times 6.33 = 37.98$

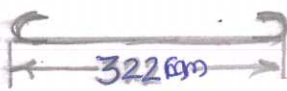
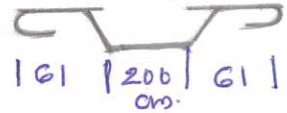
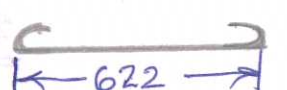
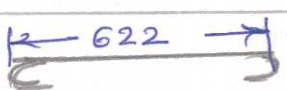
151.92m

$151.92 @ 0.22 = \underline{\underline{33.42kg}}$

8 8

VII
(b)

Barbending schedule.

Description of bars	Shape of bending dimensions in cm	Length of each m	No	Total length m	Weight kg.
Main straight bars 12mm dia.		3.144	27	92.88	
Main bent up bars 12mm dia.		3.52	26	91.52	
Bottom distribution bars - 6mm dia.		6.33	18	113.94	
Top distribution bars - 6mm dia.		6.33	6	37.98	
				<u>151.92</u>	<u>33.42 kg</u>

OR

VIII

@ The detailed specification for earth work in excavations for foundations.

Main points: - Excavation methods.
 - Finish of trench.
 - Funds during excavations.

<p>VIII (b)</p>	<ul style="list-style-type: none"> - Water in foundations - Trench sides refilling. - Measurement considering lead and lgt values - Excavation in saturated soils <p>Man points - Surface finishing including raising of joints.</p> <ul style="list-style-type: none"> - Standards for materials. - Dry mixing of mortar first and then mixing of water - Application of mortar at joints and finishing. - Curing of pointed surfaces. - Different types of pointing 	<p>8x1</p>	<p>8</p>	<p>15</p>
<p>IX</p>	<p style="text-align: center;"><u>UNIT IV</u></p> <p>a) Outgoings :- These are the expenses which are required to be incurred to maintain the revenue of the building. Various types of area, Taxes, amount for repairs, management and collection charges, sinking fund, loss of rent, miscellaneous items etc.</p> <p>b) Scrap value :- It is the value of the dismantled materials. For buildings, when the life is over, at the ends of its utility period, the dismantled materials, will fetch a certain amount and is known as Scrap value.</p> <p>For machines it is the value of the metal part.</p> <p>c) Salvage value :- It is the value at the ends</p>			

of the utility period, without being dismantled
It does not include the cost of removal, sale etc.
It is the value of the property, as it is in the
present condition.

d) Market value :- It is the amount ~~shown in~~
which can be obtained at any particular -
time, from the open market if the property is put
for sale. The market value will differ from time to
time, according to the demand and supply. Also
it may change from time to time for various reasons,
such as changes in industry, fashions, means of
transport cost of materials and labour etc.

e) Book value :- It is the amount shown in
the account book, after allowing necessary depre-
ciations. The book value of a property at a time,
is the original cost minus the amount of depreciation
up to the previous year. It will be gradually
reduced year to year and after the utility period,
becomes the scrap value.

5x3 15 15

OR

X a) Coefficient of sinking fund

$$y_c = \frac{i}{(1+i)^n - 1} = \frac{0.05}{(1+0.05)^{20} - 1}$$

$$= 0.0302$$

4

Yearly instalment of sinking fund

$$y = F \times y_c$$

$$= 50,000 / \times 0.0302$$

$$= \underline{1510/-}$$

4 8

X(b) Annual depreciation by straight line method.

$$= \frac{\text{Original cost} - \text{Scrap value}}{\text{life in } n \text{ years.}}$$

$$= \frac{2,00,000/- - 20,000/-}{80}$$

$$= 2250/-$$

2 1/2.

Depreciation for 20 years = $20 \times 2250 = 45000/-$ 2 1/2

Depreciated cost of the building after 20 years.

$$= 2,00,000/- - 45000/-$$

$$= \underline{\underline{1,55,000/-}}$$

2 7 15