SCHEME OF VALUATION

Scoring Indicators

Revision: 2010 Course title: QUANTITY SURVEYING II AND VALUATION		Course Code: 4007		
Qst. No.	Scoring Indicators	Split up Score	Sub Total	Total
	PART - A			
I. 1.	a. Pointing of basement – m^2 b. Steel roof truss - quintal	1 1	1 1	2
2.	Length of king post = Pitch x Span = (1/3) x 6 = 2 m	1 1	2	2
3.	Culvert – A tunnel structure that allows running water to pass under a roadway or railway. Usually the span is less than 6m. Bridge – A passage of transportation over a large body of water or any other physical obstruction. Usually the span is more than 6m. (Any one difference about each)	1 1	2	2
4.	Two types – a. General or Brief specification b. Detailed specification	1 1	2	2
5.	Valuation – The technique of estimating or determining the fair price or value of a property such as a building, a factory, other engineering structures of various types, land, etc. The present value of a property is determined.	2	2	2
	PART- B			
II. 1.	Brick masonry in C. M. 1:4 No. = **1** Length = **14m** [(14 = 2 x (4.3+2.7), (4.3 = 4.6 -0.3), (2.7=3-0.3)] Breadth = **0.3m** Height = **3m** [3 = 2.8+0.2] Quantity = **12.6m^3** [12.6 = 1x14x0.3x3] Drawing table which includes - Sl. No., Item, Numbers, Length, Breadth, Height, Quantity, Remarks	 1 1 1 1 1 1	6	6
2.	Plastering 20mm thick with cement plaster Walls No. = **1** Length = **12.8m** [(12.8=2x(4+2.4)), (4 = 4.6-0.3), (2.4=3-0.6) Breadth = - Height = **2.735m** [2.375 =(2.8+2.67)/2)] Quantity = **35.008 m^2** [35.008 = 1x12.8x2.735] Floors No. = **1** Length = **4m** Breadth = **2.4m**	 2 2	6	6

<table>
<tr><td></td><td>Height = -
Quantity = 9.6 m² [9.6 = 4x2.4]
Total Quantity= 44.608 m² [44.608 = 35.008+9.6]
Drawing table which includes - Sl. No., Item, Numbers, Length, Breadth, Height, Quantity, Remarks</td><td>

1
1</td><td></td><td></td></tr>
<tr><td>3.</td><td>a. Slab culvert: Culvert in which R. C. C. or stone slabs are provided to cross the water way. Slab is not cast monolithic with the abutments or piers. A slab culvert directly carries the road traffic without any cushion.
b. Pipe culvert: Culvert in which a pipe is placed in an excavated trench to move water away. It is the most commonly used drainage feature. It is easy to install and economical. Found in different shapes such as circular, elliptical etc.
c. Retaining wall: Rigid walls used for supporting the soil mass laterally so that the soil can be retained at different levels on the two sides. Every retaining wall supports a wedge of soil which is known as backfill either horizontal or inclined at the top surface. There are mainly four types of retaining wall say gravity retaining wall, cantilever retaining wall, counter fort retaining wall and buttress retaining wall.
(Any two points about each)</td><td>2

2

2</td><td>2

2

2</td><td>6</td></tr>
<tr><td>4.</td><td>Bar bending schedule or schedule of bars is a list of reinforcement bars in a tabular form giving the particulars of bars, shape of bending with sketches, length of each bar and total length of bars and total weight of reinforcement bars. For each type of R. C. C. work a schedule of bar is prepared. From the schedule of bars, the requirement of different t sizes and lengths of bars may be known and may be arranged and bent up during the time of construction.<table><tr><td>Sl. No</td><td>Description</td><td>Shape</td><td>No</td><td>Length</td><td>Total length</td><td>Weight/ m</td><td>Total Weight</td><td>Remarks</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table></td><td>4

2</td><td>6</td><td>6</td></tr>
<tr><td>5.</td><td>Painting work
Brand of paint shall be specified and ready-made paint of the required colour should be used.
If thinning is required, pure turpentine may be added to the required extent.
The surface shall be made perfectly smooth by rubbing with sand paper of different grades, first with coarse one and successively with fine sand papers.
All holes and open joints should be filled with strong putty or a mixture of glue and plaster of paris and smoothened by rubbing with sand paper.
In steel works, all ruts and scales shall be perfectly removed by scrapping and brushing.</td><td>1
1
1
1
1</td><td>6</td><td>6</td></tr>
</table>

	• One priming coat and two coats paints shall be applied. • Paints shall be applied with brushes evenly and smoothly. • Paint should be stirred in the container immediately before use. • Brushes should be cleaned and washed at the end of the day's work and kept dry. • If old paint is to be removed, it may be removed by washing with soda water or caustic soda etc. And then after removing old paint the surface should be dried and rubbed with sand paper and smoothened before paint is applied. • If old paint is not to be removed but required repainting, the surface should be washed with soap water and then paint shall be applied. (Any six)	1		
6.	Purpose of Valuation • Buying or selling property • Taxation • Rent fixation • Security of Loans • Compulsory acquisition • Insurance • Betterment charges • Speculations (Any six)	 1 1 1 1 1 1 1	6	6
7.	Outgoing: The expenses which are required to be incurred to maintain the revenue of the building. Types • Taxes • Repairs • Management and collection charges • Sinking fund • Loss of rent • Miscellaneous (Any five)	1 1 1 1 1 1	6	6
	PART - C			
III	a. Random Rubble Masonry in C. M. 1:6 Total centre to centre distance = **66 m** [66=(3x((0.2/2)+2+0.2+1.2+0.2+3+0.2+1.05+0.2+3+(0.2/2)))+(4x((0.2/2)+3+0.2+3+(0.2/2)))+((0.2/2)+1.05+(0.2/2))+((0.2/2)+2+(0.2/2))+((0.2/2)+3+(0.2/2))] Foundation No. = **1** Length = **61.2 m** [61.2 = 66-((1/2)x16x0.6)] Breadth = **0.6m** Height = **0.6m** Quantity = **22.032 m³** [22.032 = 1x61.2x0.6x0.6]	 1 2 1	8	15

	<u>Basement</u> No. = **1** Length = **62.4 m** [62.4 = 66-((1/2)x16x0.45)] Breadth = **0.45m** Height = **0.45m** Quantity = **12.636 m^3** [12.636 = 1x62.4x0.45x0.45] <u>Total Quantity</u> = **34.668 m^3** [34.668=22.032+12.636] Drawing table which includes - Sl. No., Item, Numbers, Length, Breadth, Height, Quantity, Remarks b. Earthwork excavation for foundation Total centre to centre distance = **66 m** [66=(3x((0.2/2)+2+0.2+1.2+0.2+3+0.2+1.05+0.2+3+(0.2/2)))+(4x((0.2/2)+3+0.2+3+(0.2/2)))+((0.2/2)+1.05+(0.2/2))+((0.2/2)+2+(0.2/2))+((0.2/2)+3+(0.2/2))] No. = **1** Length = **61.2 m** [61.2 = 66-((1/2)x16x0.6)] Breadth = **0.6m** Height = **0.6m** Quantity = **22.032 m^3** [22.032 = 1x61.2x0.6x0.6] Drawing table which includes - Sl. No., Item, Numbers, Length, Breadth, Height, Quantity, Remarks	2 1 1 1 1 1 1 1 1 1	7	
IV	• Brick Masonry in C. M. 1:6 for super structure Total centre to centre distance = 66 m [66=(3x((0.2/2)+2+0.2+1.2+0.2+3+0.2+1.05+0.2+3+(0.2/2)))+(4x((0.2/2)+3+0.2+3+(0.2/2)))+((0.2/2)+1.05+(0.2/2))+((0.2/2)+2+(0.2/2))+((0.2/2)+3+(0.2/2))] No. = **1** Length = **64.4 m** [64.4 = 66-((1/2)x16x0.2)] Breadth = **0.2m** Height = **3m** Quantity = **38.64 m^3** [38.64 = 1x64.4x0.2x3] • Column (Work area and sit out) No. = **2** Length = **0.2m** Breadth = **0.2m** Height = **2.1 m** Quantity = **0.168 m^3** [0.168 = 2x0.2x0.2x2.1] • Deductions i. <u>Doors, D_1</u> No. = **5** Length = **1m** Breadth = **0.2m** Height = **2.1m** Quantity = **2.1 m^3**	1 1 1 1	15	15

	ii. <u>Doors, D_2</u> No. = 2 Length = 0.8m Breadth = 0.2m Height = 2.1 m Quantity = **0.672 m^3**	1		
	iii. <u>Doors, D</u> No. = 1 Length = 1m Breadth = 0.2m Height = 2.1 m Quantity = **0.42 m^3**	1		
	iv. <u>Lintel</u> No. = 1 Length = 64.4m Breadth = 0.2m Height = 0.15 m Quantity = **1.932 m^3**	1		
	v. <u>Window, W_1</u> No. = 2 Length = 1m Breadth = 0.2m Height = 1.8 m Quantity = **0.36 m^3**	1		
	vi. <u>Window, W_2</u> No. = 1 Length = 1m Breadth = 0.2m Height = 2.1 m Quantity = **0.21 m^3**	1 1		
	vii. <u>Window, W_3</u> No. = 5 Length = 1.5m Breadth = 0.2m Height = 1.5 m Quantity = **2.25 m^3**			
	viii. <u>Ventilator, V</u> No. = 2 Length = 0.6 m Breadth = 0.2m Height = 0.5 m Quantity = **0.12 m^3**	1		
	ix. <u>Sit out opening</u> No. = 1 Length = 4.7 Breadth = 0.2m	1		

	Height = 2.1 m Quantity = **1.974 m^3** x. <u>Work area</u> No. = 1 Length = 3.2m Breadth = 0.2m Height = 2.1 m Quantity = **1.344 m^3** Total quantity for deduction = **11.142 m^3** Net quantity = **27.426 m^3** Drawing table which includes - Sl. No., Item, Numbers, Length, Breadth, Height, Quantity, Remarks	1 1 1		
V	<u>Stem</u> • 16mm ϕ 400mm c/c No. = **76** [76= ((30-(2x0.05))/0.4)+1] Length = **5.668 m** [5.668 = 4.924+0.6+(9x0.016)] Total length = **430.77 m** [430.77= 76x5.668] Weight/m = **1.58 kg/m** Quantity = **680.613 kg** [680.613 = 430.77x1.58] • 10mm ϕ 400mm c/c No. = **13** Length= **31.84 m** [(31.84 = 29.95+1.35+(6x9x0.010)), (29.95=30-(2x0.025)), (1.35 =3x45xϕ = 3x45x0.01] Total length = **413.92 m** [413.92= 13x31.84] Weight/m = **0.62 kg/m** Quantity = **256.63 kg** [256.63 = 413.92x0.62] • 16mm ϕ 200mm c/c No. = **151** Length = **4.168 m** Total length = **629.36 m** Weight/m = **1.58 kg/m** Quantity = **994.40 kg** • 16mm ϕ 200mm c/c No. = **151** Length = **2.668 m** Total length = **402.868** m Weight/m = **1.58 kg/m** Quantity = **636.53 kg** • 16mm ϕ 150 mm c/c No. = **201** Length = **2.792 m** Total length = **561.192 m** Weight/m = **1.58 kg/m** Quantity = **886.68 kg** • 10mm ϕ 100mm c/c No. = 27	2 2 2 1 1 1	15	15

	Length = **31.66m** Total length = **854.82 m** Weight/m = **0.62kg/m** Quantity = **529.99 kg** Stem (Outer) • 12mm ϕ 500mm c/c No. = **61** Length = **5.524m** Total length = **336.96 m** Weight/m = **0.88 kg/m** Quantity = **299.52 kg** • 10mm ϕ 200mm c/c No. = **26** Length = **31.84 m** Total length = **827.84 m** Weight/m = **0.62 kg/m** Quantity = **513.26 kg** • 16mm ϕ 200mm c/c No. = **151** Length = **2.392 m** Total length = **361.192 m** Weight/m = **1.58 kg/m** Quantity = **570.68 kg** • 10mm ϕ 500mm c/c No. = **23** Length = **4.49 m** Total length = **103.27 m** Weight/m = **0.62 kg/m** Quantity = **64.027 kg** Total quantity = 5432.327 kg = 54.33 Qtl. Drawing table which includes - Sl. No., Description, Shape, Numbers, Length, Total length, Weight/m, Total weight, Remarks	1 1 1 1 1 1		
VI	a. Bridge pier Brick work in C. M. 1:5 for foundation footing upto bed level Straight portion • I[st] footing No. = **3** Length = **8.3m** Breadth = **1.8m** Height = **0.3m** Quantity = **13.446 m³** • II[nd] footing No. = **3** Length = **8.3m** Breadth = **1.7m** Height = **0.3m**	3	10	15

	Quantity = **12.669 m^3** • III[rd] footing No. = **3** Length = **8.3m** Breadth = **1.6m** Height = **0.3m** Quantity = **11.952 m^3** Total quantity = **38.097 m^3** <u>Ease water end</u> • I[st] footing No. = **3** Area = **1.272 m^2** [(1/2)x(Л/4)x1.8^2] Height = **0.3m** Quantity = **1.145 m^3** • II[nd] footing No. = **3** Area = **1.135 m^2** [(1/2)x(Л/4)x1.7^2)] Height = **0.3 m** Quantity = **1.021 m^3** • III[rd] footing No. = **3** Area = **1.00 m^2** [(1/2)x(Л/4)x1.6^2)] Height = **0.3m** Quantity = **0.905 m^3** Total quantity = **3.071 m^3**	3		
	<u>Cut water end</u> • I[st] footing No. = **3** Area = **1.39 m^2** [(1/2)x1.8x1.8x0.866] Height = **0.3m** Quantity = **1.263 m^3** • II[nd] footing No. = **3** Area = **1.251 m^2** [(1/2)x1.7x1.7x0.866] Height = **0.3 m** Quantity = **1.126 m^3** • III[rd] footing No. = **3** Area = **1.108 m^2** [(1/2)x1.6x1.6x0.866] Height = **0.3m** Quantity = **0.997 m^3** Total quantity = **3.386 m^3**	3		
	Grand total quantity = **44.554 m^3** b. Slab culvert R. C. C. 1:1.5:3 using 20mm for broken duck slab No. = **1**	1		

	Length = **5 m** Breadth = **2.1 m** [2.1 = 1.5+0.3+0.3] Height = **0.22 m** Quantity = **2.31 m^3** Total quantity = **2.31 m^3**	1 1 1 1 1	5	
VII	a. Detailed specification <u>Earthwork excavation</u> • Earthwork– Foundation trenches shall be dug out to the exact width of foundation concrete and the sides shall be vertical. If the soil is not good and does not permit vertical sides, the sides should be sloped back or protected with timber shoring. Excavated earth shall not be placed within 1m (3') of the edge of the trench. • Finish of trench- The bottom of foundation trench shall be perfectly levelled both longitudinally and transversely and the sides of the trench shall be dressed perfectly vertical from bottom up to the least thickness of loose concrete may be laid to the exact width as per design. The bed of the trench shall be lightly watered and well rammed. Excess digging if done through mistake shall be filled with concrete at the expense of the contractor. Soft or defective spot shall be drug out and removed filled with concrete or with stabilized soil. If rocks or boulders are found during excavation, these should be removed and the bed of the trenches shall be levelled and made hard by consolidating the earth. Foundation concrete shall not be laid before the inspection and approval of the trench by the engineer-in-charge. • Finds- Any treasure and valuables or materials found during the excavation, shall be property of the Government. • Water in foundation- Water, if any accumulates in the trench should bailed or pumped out without any extra payment and necessary precaution shall be taken to prevent surface water to enter into the trench. • Trench filling- After the concrete has been laid masonry shall be constructed the remaining portion of the trench shall be filled up with earth in layer of 15cm (6") and watered and well rammed. The earth filling shall be free from rubbish and refuse matters and all clods shall be broken before filling. Surplus earth not required, shall be removed and disposed and site shall be levelled and dressed. • Measurement- the measurement of the excavation shall be taken in cu m (cu ft) as for rectangular trench bottom width of concrete multiplied by the vertical depth of foundation from general level and multiplied by the length of trenches even through the contractor might have excavated with sloping side for his convenience. Rate shall be for complete work for 30m (100 ft)	4	8	15

lead and 1.50m (5') lift, including all tools and plants required for the completion of the works. For extra lead of 30m and extra lift of 1.5m separate extra rate is provided.

- Excavation in saturated soil- excavation in saturated soil or below sub-soil water level shall be taken a separate item and shall be carried out in the same manner as above. Pumping and bailing out of water and removal of slush shall be included in the item. Timbering of the sides of the trench if required shall be taken under a separate item and paid separately.

(Any four points)

<u>R. C. C.</u> — 4

- Proportion- The proportion of cement concrete shall be one of 1:2:4 proportion by volume for slabs, beams and lintels and 1:1.5:3 for columns unless otherwise specified.
- Cement- The cement shall be used in this work shall comply with the standard requirements. Fine Aggregate-The sand to be used shall be clean and coarse and shall be free from any organic or vegetable matter. The sand shall be washed, if there is any trace of earth in it.
- Coarse Aggregate- The coarse aggregate shall consist of 67% of black trap metal carrying in size from 20mm to 40mm and 33% of black trap metal carrying in size from 20mm to 6mm. The coarse aggregate for the concrete work shall be clean and free from impurities such as earth, coal dust and other organic materials. The unclean aggregates shall have to be screened and washed before use.
- Water- The water to be used in concrete work shall be clean and fresh.
- Reinforcement- All reinforcement shall be of steel which shall comply with the standard requirements. All bars shall be placed as per design given by the engineer and utmost care shall be taken to keep them in the same position while packing concrete around them. Before laying the concrete, the reinforcement shall be got approved by the engineer.
- Centering- The centering for the concrete work shall be sufficiently strong and rigid and in good condition so as to turn out a good smooth surface. The props to be used for centering shall be of timber bullies. The spacing of bullies shall not be more than 120cm centre to centre. The bullies shall be supported at the base on 40mm thick wooden plate having area not less than 0.10sq m. The surface of formwork shall be oiled before placing of concrete.
- Mixing- The mixing of concrete shall be done in a mechanical mixer or by hand operations depending on the quantity of the

	concrete which shall be decided by the engineer. In the former case, the mixing drum shall be turned at least for 1.5 minutes after all the ingredients are added and the drum shall be completely emptied every time. The concrete from the drum shall be placed on a water tight platform. • Laying and Curing- Before start laying of concrete in position; the centering shall be well watered. The concrete shall be laid in forms and tapped in such a way that no honeycomb surface appears on removal of the forms. The cement concrete shall be kept well watered for at least 20 days. • Finishing of Exposed surface- All exposed surfaces of the concrete work shall be finished with 12mm thick cement plaster of finish and three coats of white or colour was shall be applied on these exposed surfaces of concrete.			
	b. Aqueduct R. C. C. 1:1.5:3 for trough of the aqueduct	3		
	<u>Vertical</u> No. = **2** Length = **8.1 m** [8.1 = 2.2+2.5+2.2+(4x0.3)] Breadth = **1.1 m** [1.1 = 0.8+0.3] Height = **0.15 m** Quantity = **2.673 m^3**			
	<u>Base slab</u> No. = **1** Length = **8.1 m** Breadth = **1.8 m** Height = **0.2 m** Quantity = **2.916 m^3**	3		
	Total quantity = **5.589 m^3**	1		

VIII	Bottom bars • Straight bar - 16mm ϕ No. = **2** Length = **3.142m** Total length = **6.284 m** Weight/m = **1.58 kg/m** Quantity = **9.93 kg** • Cranked bar – 16mm ϕ No. = **1** Length = **3.327m** Total length = **3.327 m** Weight/m = **1.58 kg/m** Quantity = **5.26 kg** Hanger bar - 10mm ϕ No. = **2** Length = **3.07 m** Total length = **6.14 m** Weight/m = **0.62 kg/m** Quantity = **3.8 kg** Stirrups - 6mm ϕ No. = **16** Length = **0.908 m** Total length = **14.528 m** Weight/m = **0.22 kg/m** Quantity = **3.196 kg** Total quantity = **22.186 kg**	3 4 3 4 1	15	15
IX	a. Methods of valuation • Rental method of valuation – Net income by the way of rent is found out by deducting the outgoings from gross rent. Suitable rate of interest and years purchase is calculated. Net income is multiplied with the years purchase gives the capitalized value or valuation of property is done. • Direct comparison with the capital value – This method may be adopted when the rental data is not available from the property concerned, but there are evidences of sales price of properties as a whole. In such cases the capitalized value of the property is fixed by the comparison with capitalized value of similar property in the locality. • Valuation based on profit – This method of valuation is suitable for buildings like hotels, cinema theatres, etc. for which the capitalized value depends on the profit. In such cases the net annual income is worked out after deducting from the gross income all possible working expenses, outgoings, interest on the capital invested etc. The net profit is multiplied by Years purchase to get the capitalized value. In such cases the valuation	2 2 2	8	15

		may work out to be too high in comparison with the cost of construction. • Valuation based on cost – In this method the actual cost incurred in constructing the building or in possessing the property is taken as basis to determine the value of property. In such cases necessary depreciation should be allowed and the points of obsolescence should also be considered. • Development method of valuation – This method of valuation is used or the properties which are in the undeveloped stage or partly developed stage and partly undeveloped stage. If a large place of land is required to be divided into plots after providing for roads, parks etc., this method is to be adopted. In such cases, the probable selling price of the divided plots, the area required for roads, parks, etc., and other expenditures for development should be known. • Depreciation method of valuation – According to this method of valuation the building should be divided into four parts say walls, roofs, floor, doors and windows and the cost of each part should be worked out on the present day rates by detailed measurements. Depreciated value is calculated. The values arrived at will be exclusive of cost of land, water supply, electric and sanitary fittings etc., and will apply to those buildings only which have been properly maintained. If the repairs had been neglected in the past and the present condition is bad, suitable deduction should be made from the values. The present value of land and water supply, electric and sanitary fittings etc., should be added to the valuation of the building to arrive at total valuation of the property. (Any four methods)	2		
		b. Scrap value – Value of dismantled materials after the utility period of a structure or a machine or any such.	1		
		Salvage value – It is the value at the end of the utility period without being dismantled.	1	7	
		Market value – It is the amount which can be obtained at any particular time from the open market if the property is put for sale.	1		
		Book value – It is the amount shown in account book after allowing necessary depreciations. The book value of a property at a particular year is the original cost minus the amount of depreciation upto the previous year.	1		
		Sinking fund – The fund which is gradually accumulated by way of periodic on annual deposit for the replacement of the building or structure at the end of its useful life.	1		
		Depreciation – It is the gradual exhaustion of the usefulness of a property. The decrease or loss in the value of a property due to structural	1		

<table>
<tr><td></td><td>deterioration, wear and tear, decay and obsolescence.
Years purchase – It is defined as the capital sum required to be invested in order to receive an annuity of Re 1. 00 at certain rate of interest.</td><td>1</td><td></td><td></td></tr>
<tr><td>X</td><td>a. Straight line method
Annual depreciation=(Original Cost – Scrap value)/ Life in years
=(8000-1000)/5 = 1400
<table>
<tr><td>Age in years</td><td>Depreciation</td><td>Book value</td></tr>
<tr><td>0</td><td>0</td><td>8000</td></tr>
<tr><td>1</td><td>1400</td><td>(8000-1400) =6600</td></tr>
<tr><td>2</td><td>1400</td><td>5200</td></tr>
<tr><td>3</td><td>1400</td><td>3800</td></tr>
<tr><td>4</td><td>1400</td><td>2400</td></tr>
<tr><td>5</td><td>1400</td><td>1000</td></tr>
</table>
b. Constant percentage method
Percentage rate of depreciation=1-(Scrap value/Original Cost)$^{1/\text{Life in years}}$
= 1-((1000/8000)$^{1/5}$) = 0.34
<table>
<tr><td>Age in years</td><td>Depreciation</td><td>Book value</td></tr>
<tr><td>0</td><td>0</td><td>8000</td></tr>
<tr><td>1</td><td>(0.34x8000)=2720</td><td>(8000-2720)=5280</td></tr>
<tr><td>2</td><td>(0.34x5280)=1795.2</td><td>(5280-1795.20=3484.8</td></tr>
<tr><td>3</td><td>1184.832</td><td>2299.968</td></tr>
<tr><td>4</td><td>781.989</td><td>1517.979</td></tr>
<tr><td>5</td><td>516.113</td><td>1001.866</td></tr>
</table></td><td>1
1
1
4.5

1
1
1(Table)
4.5</td><td>7.5

7.5</td><td>15</td></tr>
</table>