

Scoring Indicators

COURSE NAME : ESTIMATION AND COSTING

COURSE CODE : 4013

QID : 2103230180

Q No	Scoring Indicators	Split score	Sub Total	Total score
PART A				9
I. 1	Sanction of the detailed estimate, design calculations, quantities of works, rates and cost of the work by competent authority of engineering department	1	1	
I. 2	5 %	1	1	
I. 3	Abstraction is the process of collating all the quantities 'taken off' into a single total for each element that can then be transferred into the bill of quantities	1	1	
I. 4	15 %	1	1	
I. 5	the average horizontal distance between centre of excavation to centre of deposition	1	1	
I. 6	the rafter extending from the wall plate to the ridge and forming the angle of a hip roof.	1	1	
I. 7	Square metre	1	1	
I. 8	It is the loss in the value of property due to its use, life, wear, tear, decay, etc	$\frac{1}{2} \times 2$	1	
I. 9	1. operating lease 2. financial lease	1	1	
PART B				24
II. 1	<p style="text-align: center;">Revised estimate</p> <ul style="list-style-type: none"> • Detailed estimate for the Revised quantities and rates of items of works originally provided in the estimate • When a sanctioned estimate is likely to exceed by more than 5 % either from rates being found insufficient or any causes 		3	

	<p>except important structural alterations</p> <ul style="list-style-type: none"> • Material deviation from original proposal <p>Supplimentary estimate</p> <ul style="list-style-type: none"> • Estimate prepared to include all additional works. • Material deviation of structural nature • Required due to some new works or due to change of design • Additions or revisions of drawings may be necessary <p>2 points from each</p>	$\frac{3}{4} \times 4$		
II. 2	<ul style="list-style-type: none"> • No deduction shall be made for ends of joists, beams, posts, etc, and openings not exceeding 0.5 sqm each and no addition shall be made for reveals, jambs, soffits, sills, etc, of these openings nor for finish to plaster around ends of joists, beams, posts, etc • For opening exceeding 0.5 m² but not exceeding 3 m² when both faces are plastered with same plaster, deduction shall be made for one face only. No additions shall be made for jambs, soffits, sills. • In case of openings of area above 3 sqm each, deduction shall be made for opening on each face but jambs., soffits and sills shall be measured. 	1 x 3	3	
II. 3	<ul style="list-style-type: none"> • The preparation of BOQ : It involves reading of drawings taking measurements, calculation of quantities, checking dimensions, abstracting, billing , etc • Visiting the sites and asses the quantity and quality of work • Computing the value of work done • Preparation of adjustment bills, in case of deviations in drawing and specifications • Give advice in arbitration or legal cases involving court cases <p>Any 3</p>	1 x 3	3	
II. 4	<ul style="list-style-type: none"> • The quantities of materials and labour required per unit of various finished item of work have been standardized and given in the data book 		3	

	<ul style="list-style-type: none"> It is based on scientific assessment of inputs of materials, labour and machinery in various items of works normally involved in Civil Construction Projects Delhi Analysis of Rates (DAR) Volume I and II prepared by CPWD is used for Analysis of Rates 	1 X 3		
II. 5	<p>Cost index</p> <ul style="list-style-type: none"> Factor adopted for different places to incorporate conveyance Prepared by pwd <p>Overhead</p> <ul style="list-style-type: none"> Costs of running the company Head office administrative costs – property costs, finance charges on loans insurances, staff, taxes, marketing and tendering activities 	1.5 x 2	3	
II. 6	<p>Length = $\sqrt{\left(\frac{6}{2}\right)^2 + \left(\frac{6}{3}\right)^2} = \sqrt{14}$</p> <p>Quantity = 4 nos x $\sqrt{14}$ x 0.06 * 0.13 = 0.1167 cum</p>	2 1	3	
II. 7	<p>Q = 15x 1.2 x 0.2 = 6.3cum</p> <p>Standard size = 19 cm x 9 cm x 9 cm = 0.001539 cum</p> <p>No of brick = 6.3/0.001539 = 4093 nos</p>	1 1 1	3	
II. 8	<p>Scrap Value is the value of dismantled materials of a property at the end of its utility period, and absolutely useless except for sale as scrap.</p> <p>Salvage value - Estimated value of a built up property at the end of its useful life without being dismantled</p>	1.5 x 2	3	
II.9	rental method, profit based method, depreciation method, belting method, development method, hypothecated building scheme method	½ x 6	3	
II.10	<ul style="list-style-type: none"> Property is assumed to lose value by a constant amount every year, 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 Scrap/ Salvage Value remains. 	2 1	3	

	<ul style="list-style-type: none"> • Annual Depreciation, $D = \frac{C - S_c}{n}$ • C – Original Cost • S_c – Scrap / Salvage Value • n – Life of property in years 			
	PART C			42
III. 1	<p>Computation of Earthwork</p> <p>Volume of Earthwork</p> <ol style="list-style-type: none"> 1. Formula of Mid Section method 2. Formula of trapezoidal method/ Average end area / Mean sectional method 3. Formula of prismoidal method according to Simpson's 1/3rd rule <ol style="list-style-type: none"> 1. Method 1 – Mid Sectional formula <p>Mean depth, $d_m = \frac{d_1 + d_2}{2}$</p> <p>Area of mid section, $A_m = Bd_m + sd_m^2$</p> <p>Volume of earthwork, $V = A_m \times L = (Bd_m + sd_m^2) \times L$ 2. Method 2 : Trapezoidal Formula or Average End Area or Mean Sectional Area Formula <p>If A_1 and A_2 are areas of the ends and the end sections are in parallel planes, L is the length between two sections, the volume of the prismoid is given by:</p> $V = L \frac{A_1 + A_2}{2}$ <ol style="list-style-type: none"> 3. Prismoidal formula – for the calculation of the quantity of earthwork for a single strip having three cross sections $V = \frac{L}{6} (A = A_1 + A_2 + 4A_m)$ <p>A_1 and A_2 are the areas at the ends and A_m is the area of mid section parallel to ends</p> <p>L is the length between the end sections</p> <p>Any 2</p> </p>	7	7	3.5 x 2

III. 2	chainage	depth	mean depth	area	section length	Quantity			7	7	
	0	0.6									
			0.9	8.82	30	264.6					
	1	1.2									
			1.4	15.12	30	453.6					
	2	1.6									
			1.8	20.88	30	626.4					
	3	2									
			1.65	18.65	30	559.5					
		4	1.3								
	<ul style="list-style-type: none"> Total quantity of earthwork = 1903.5 m³ 										
	Mean depth								2		
	Area								2		
	Quantity								3		
III. 3	materials									7	7
	sl no	item	quantity	unit	rate	Unit /rate	cost				
	1	40mm aggregate	0.92	cum	700	cum	644				
	2	cement	0.115	cum	3970	cum	456.55				
	3	sand	0.46	cum	1000	cum	460				
							1560.55			2.5	
	Labour										
	sl no	particulars	description	unit	rate	unit/rate	cost				
	1	Mazon	0.2	head	850	Head/ day	170				
	2	men mazdoor	1.8	head	750	Head/ day	1350				
3	women mazdoor	1.4	head	700	Head/ day	980					
						2500			2.5		
	total					4060.55					
	10 % cp					406.055					
	net total					4466.61			2		
III. 4	Specifications of First class brickwork									7	7
	<ul style="list-style-type: none"> All of the bricks used should be of first class. 										

- See the characteristics of first class bricks .
- Soaking of bricks should be done by submerging in a tank before use.
- Soaking should be continue until the air bubbles are ceased.
- Soaking should be for a period of 12 hour before use.

Mortar specifications for first class brickwork

- Material of mortar should be of standard specifications.
- For mortar, cement should be fresh ordinary Portland cement of standard specifications.
- Sand should be sharp and free from organic and foreign particles.
- If we want to make rich mortar, sand should be coarse or medium.
- For weak mortar, local fine sand may be used.
- Cement sand ratio of mortar should be 1:3 to 1:6 as specified.
- To get the required proportion, materials of mortar should be measured with the measuring box.
- Materials of mortar should be first mixed dry to have a uniform color.
- The platform should be clean for mortar mixing.
- Mixing should be done at least three times.
- Then water should be added gradually for workable consistency.
- Mortar should be freshly mixed.
- Old mortar should not be used.
- Mortar should be mixed with water for one hour work so that mortar may be used before setting.

Any 7 points

1 x 7

III. 5			7	7																																									
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="7" style="text-align: center;">materials</th> </tr> <tr> <th style="width: 5%;">sl no</th> <th style="width: 20%;">item</th> <th style="width: 10%;">quantity</th> <th style="width: 10%;">unit</th> <th style="width: 10%;">rate</th> <th style="width: 10%;">unit/rate</th> <th style="width: 10%;">cost</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>brick</td> <td>500</td> <td>nos</td> <td>6200</td> <td>1000 nos</td> <td>3100</td> </tr> <tr> <td>2</td> <td>dry sand</td> <td>0.24</td> <td>cum</td> <td>3000</td> <td>cum</td> <td>720</td> </tr> <tr> <td>3</td> <td>cement</td> <td>69</td> <td>kg</td> <td>7500</td> <td>tonne</td> <td>517.5</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: right;">4337.5</td> </tr> </tbody> </table>	materials							sl no	item	quantity	unit	rate	unit/rate	cost	1	brick	500	nos	6200	1000 nos	3100	2	dry sand	0.24	cum	3000	cum	720	3	cement	69	kg	7500	tonne	517.5							4337.5	2.5	
materials																																													
sl no	item	quantity	unit	rate	unit/rate	cost																																							
1	brick	500	nos	6200	1000 nos	3100																																							
2	dry sand	0.24	cum	3000	cum	720																																							
3	cement	69	kg	7500	tonne	517.5																																							
						4337.5																																							
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="7" style="text-align: center;">labour</th> </tr> <tr> <th style="width: 5%;">sl no</th> <th style="width: 15%;">particulars</th> <th style="width: 10%;">description</th> <th style="width: 10%;">unit</th> <th style="width: 10%;">rate</th> <th style="width: 10%;">unit/rate</th> <th style="width: 10%;">cost</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Mazon</td> <td>0.9</td> <td>each</td> <td>500</td> <td>each / day</td> <td>450</td> </tr> <tr> <td>2</td> <td>man</td> <td>0.35</td> <td>each</td> <td>300</td> <td>each / day</td> <td>105</td> </tr> <tr> <td>3</td> <td>women</td> <td>0.7</td> <td>each</td> <td>250</td> <td>each / day</td> <td>175</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: right;">730</td> </tr> </tbody> </table>	labour							sl no	particulars	description	unit	rate	unit/rate	cost	1	Mazon	0.9	each	500	each / day	450	2	man	0.35	each	300	each / day	105	3	women	0.7	each	250	each / day	175							730	2.5	
labour																																													
sl no	particulars	description	unit	rate	unit/rate	cost																																							
1	Mazon	0.9	each	500	each / day	450																																							
2	man	0.35	each	300	each / day	105																																							
3	women	0.7	each	250	each / day	175																																							
						730																																							
	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">total</td> <td style="text-align: right;">5067.5</td> </tr> <tr> <td>10 % cp</td> <td style="text-align: right;">506.75</td> </tr> <tr> <td>net total</td> <td style="text-align: right;">5574.25</td> </tr> </table>	total	5067.5	10 % cp	506.75	net total	5574.25	2																																					
total	5067.5																																												
10 % cp	506.75																																												
net total	5574.25																																												
III. 6	<p>Procedure for rate analysis</p> <p>Cost of materials at source and at site of construction. The costs of materials are taken as delivered at site inclusive of the transport local taxes and other charges</p> <p>Purpose of Analysis of rates:</p> <ol style="list-style-type: none"> 1. To work out the actual cost of per unit of the items 2. To work out the economical use of materials and processes in completing the particulars item. 3. To work out the cost of extra items which are not provided in the contract bond, but are to be done as per the directions of the department. 4. To revise the schedule of rates due to increase in the cost of material and labour or due to change in technique. <p>Cost of labour -types of labour, standard schedule of rates The labour charges can be obtained from the standard schedule of rates 30% of the skilled labour provided in the data may be taken as Ist class, remaining 70% as II class. The rates of materials for Government works</p>																																												

								0.648 22.53	1		
	BRICK = 22.53 Cum										
III. 10									3.5 x 2	7	7
	Sl no	Descriptn	No	L	B	H	Q				
	1	RCC without steel base slab	1	30	2.5	0.35	26.25 Cum				
	2	RCC without steel stem	1	30	0.35	6.15	64.575 cum				
III. 11	The total amount of sinking fund to be accumulated at the end of 20 years $S = 30000 \times (90/100) = \text{Rs.}27000.00$ Annual installments of sinking fund $I = Si / (1+i)^n - 1$ $= 27000 \times 0.04 / (1+0.04)^{20} - 1 = \text{Rs.}907.20$ Annual installments for sinking fund requires for 20 years = Rs.907.20								2 4 1	7	7
III. 12	To Calculate Capital Cost: Cost of building = Rs. 75000 Cost of Sanitary and water supply = 10% building cost = Rs. 7500 Cost of electric installation @ 8% of building cost = Rs. 6000 Cost of internal roads and compound wall = Rs. 10000 $\Sigma = \text{Rs.}98500$ Standard rent per annum with 6 % interest on capital cost = $98500 \times \frac{6}{100} = 5910$ Municipal taxes per annum = Rs. 300 $\Sigma = \text{Rs.}6210$ Standard rent per month = $\frac{6210}{12} = \text{Rs.} 517.50$								1 1 1 1 1 1 1	7	7