TED (15) – 5014

(REVISION — 2015)

Reg. No.....

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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE — OCTOBER, 2018

QUANTITY SURVEYING - II

[*Time* : 3 hours

(Maximum marks : 100)

[*Note* :—1. Missing data if any suitably assumed.

2. Sketches are accompanied.

3. Steel table is permitted.

4. Quantities to be worked out in standard form.]

PART — A

(Maximum marks : 10)

Marks

I Answer *all* questions in one or two sentences. Each question carries 2 marks.

1. Calculate the length of common rafter in terms of eave to eave span, rise is 1/3 span.
2. Distinguish between bridge and culvert.
3. Write the total length of straight bar hooked at both ends.
4. State the overlapping length of joint of straight bars.
5. Define the term sinking fund. (5×2 = 10)

PART — B

(Maximum marks : 30)

II Answer any *five* of the following questions. Each question carries 6 marks.

1. Calculate the earth filling in foundation for the figure - I.
2. A shed of inside dimension 9.9×6m is provided with gabled roof. Wall thickness 20cm, eaves projection 60cm, rise 1/3 span. Calculate the quantity of common rafter assuming the spacing between common rafter is 50cm and size of common rafter is 50 × 125mm.
3. Calculate the quantity of RCC work 1:2:4 nominal size in slab and wearing coat of slab culvert shown in figure - III
4. Write the detailed specification for pointing.
5. Calculate the quantity of straight bars with hooks at both ends in a RCC beam of clear span 3.4m, wall thickness 20cm, the beam is completely inserted into walls at both ends. The straight bars are 16mm dia 4 number with cover 2.5cm.
6. State the purpose of valuation.
7. The cost of a building at present market rate is ₹ 6,25,000. The rate of depreciaton as 2%. Determine the value of the building after 10 years. (5×6 = 30)

Marks

PART — C

(Maximum marks : 60)

(Answer *one* full question from each unit. Each full question carries 15 marks.)

UNIT — I

III (a) Compute the quantity of painting doors and windows for the given fig - I 7

(b) Calculate the quantity of brickwork in cement mortar 1:5 for walls in figure -I. 8

OR

IV Compute the quantities of the following items for the given figure - II of septic tank.

(i) Precast RCC work for tank and soak pit.

(ii) Dry brickwork in soak pit.

(iii) Cement plastering with CM 1:3 for tank and floor.

(iv) 50mm aggregate and coarse sand on outer side of soakpit. 15

UNIT — II

V Compute the quantities of the following items from the given figure-III of RCC slab culvert.

(i) Earth work excavation and plain cement concrete for foundation.

(ii) First class brickwork in CM 1:4.

(iii) Steel bars including bending in RCC work. 15

OR

VI Calculate the quantities of following items from the given figure-IV of pipe culvert.

(i) Earth work excavation in foundation.

(ii) Cement concrete 1:4:8 in foundation. 15

UNIT — III

VII Prepare the detailed estimate of a RCC beam shown in figure -V of 5.5m clear span size of beam 250 × 550mm, the side cover 40mm and top and bottom is 30mm each. The wall thickness is 450mm and the beam has 300 mm bearing over the wall on both sides. Also prepare bar bending schedule. 15

OR

VIII Write the detailed specification of the following.

(i) Brick masonry work.

(ii) Cement concrete 1:2:4 for RCC. 15

UNIT — IV

IX (a) Distinguish straight line method and constant percentage method of calculating depreciation. 7

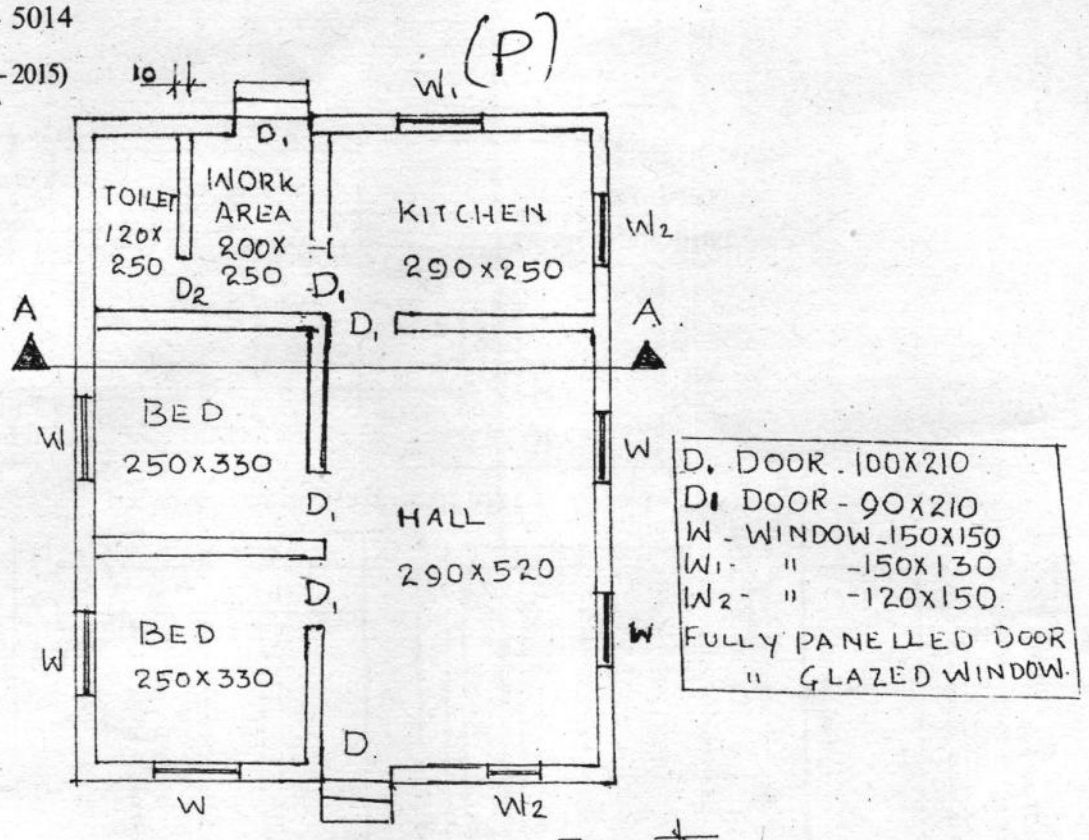
(b) Explain different methods of valuation. 8

OR

X (a) Define scrap value, salvage value, book value. 7

(b) The built up area of a building on 450m² land near a city is 250m². The plinth area rate is ₹ 2500/m² including water supply, sanitary and electrification charges. The age of the building may be taken as 20 years. The cost of the land is ₹ 1200/m². The rate of depreciation as 2%. Calculate the present value of the property. 8

———————


TOILET 120X 250
WORK AREA 200X 250
KITCHEN 290X250
BED 250X330
HALL 290X520
BED 250X330
D, DOOR - 100X210
D1 DOOR - 90X210
W - WINDOW - 150X150
W1 - " - 150X130
W2 - " - 120X150
FULLY PANELLED DOOR
" GLAZED WINDOW

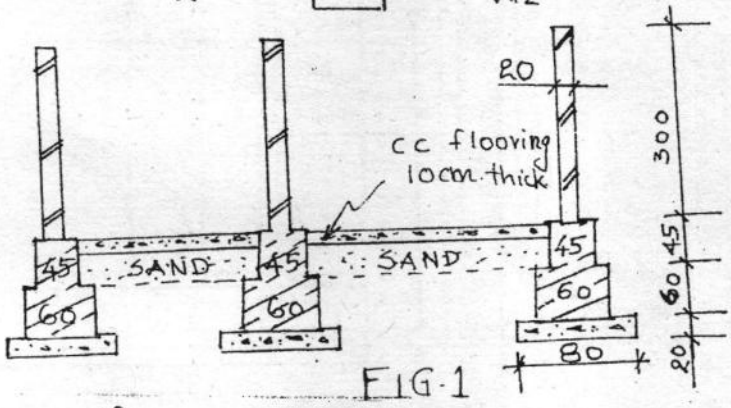

cc flooring 10cm thick
SAND
SAND

FIG-1

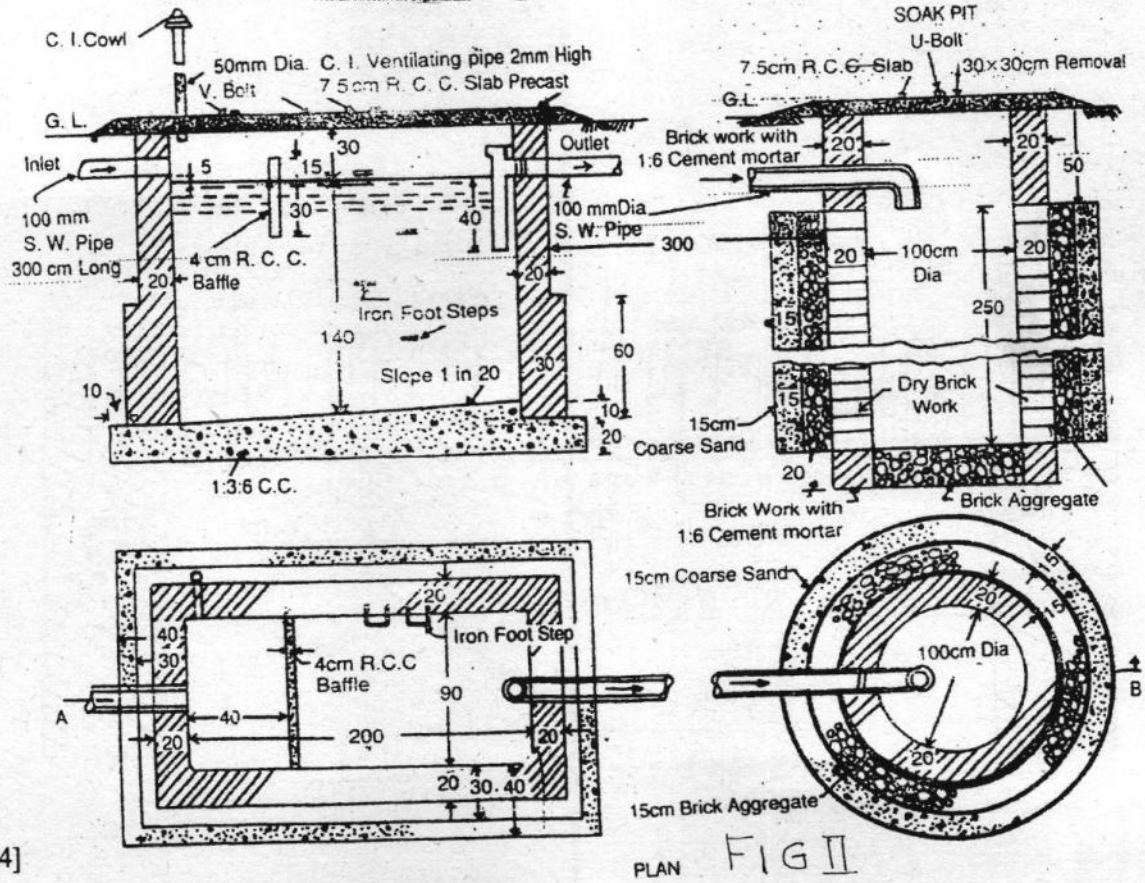

C. I. Cowl
50mm Dia. C. I. Ventilating pipe 2mm High
V. Bolt
7.5cm R. C. C. Slab Precast
G. L.
Inlet
Outlet
100 mm S. W. Pipe 300 cm Long
4 cm R. C. C. Baffle
Iron Foot Steps
Slope 1 in 20
1:3:6 C.C.
SOAK PIT
U-Bolt
7.5cm R.C.C. Slab
30×30cm Removal
Brick work with 1:6 Cement mortar
100 mmDia S. W. Pipe
100cm Dia
Dry Brick Work
15cm Coarse Sand
Brick Aggregate
Brick Work with 1:6 Cement mortar
4cm R.C.C Baffle
Iron Foot Step
15cm Coarse Sand
100cm Dia
15cm Brick Aggregate
PLAN

FIG II

P

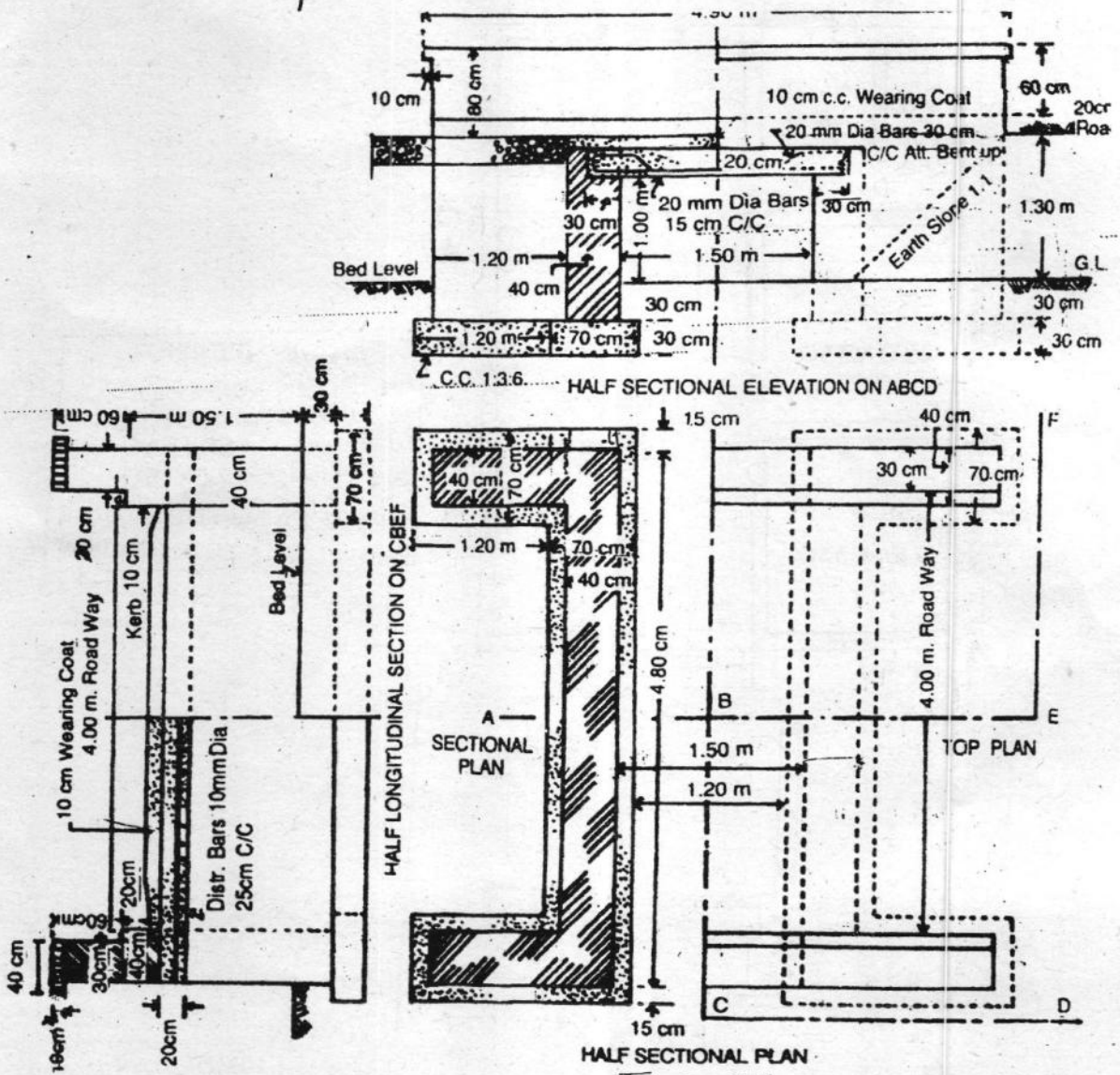
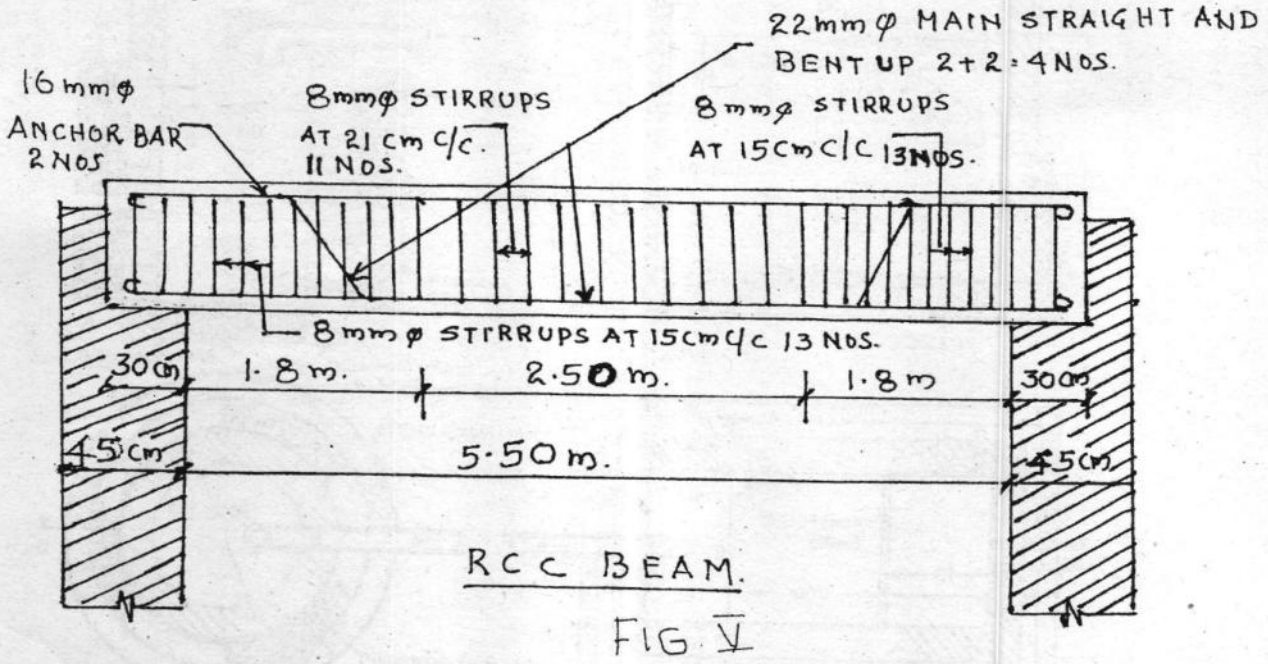


FIG III



RCC BEAM.

FIG V

P

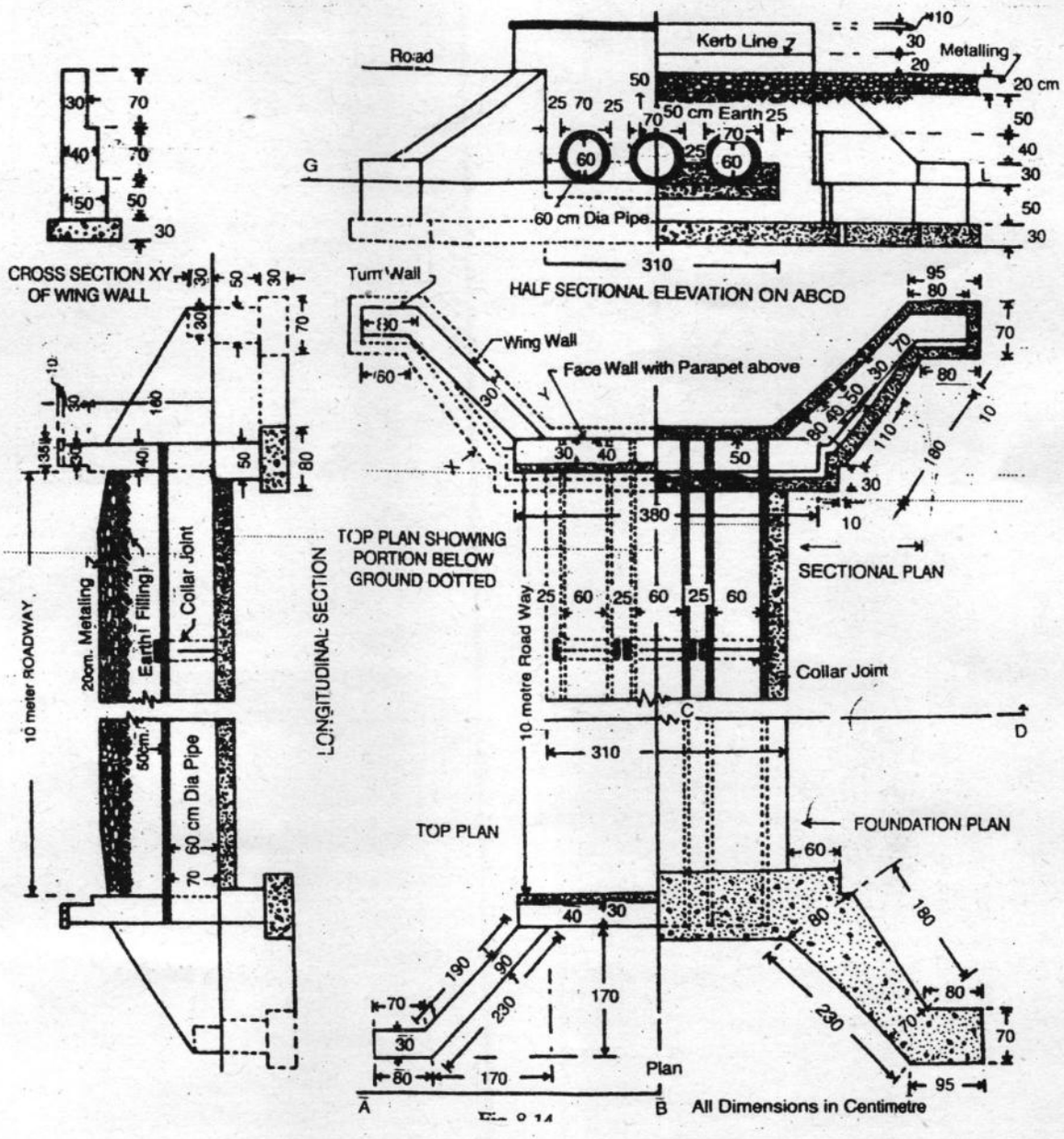

Road
Kerb Line
Metalling
20 cm
50 cm Earth
60 cm Dia Pipe
310
HALF SECTIONAL ELEVATION ON ABCD
CROSS SECTION XY OF WING WALL
Turn Wall
Wing Wall
Face Wall with Parapet above
TOP PLAN SHOWING PORTION BELOW GROUND DOTTED
SECTIONAL PLAN
Collar Joint
10 meter ROADWAY
20cm. Metaling
Earth Filling
LONGITUDINAL SECTION
10 metre Road Way
TOP PLAN
FOUNDATION PLAN
Plan
All Dimensions in Centimetre

FIG IV

1) 14

P

1

Scoring Indicators

(1)

Code

Version (15)5014

Qn:No	Scoring Indicators	Split score	Total score
	Quantity Surveying - II		
I	PART. A.		
1.	0.6 x eaves span.	2	
2.	A structure having a linear waterway upto 6m is called a culvert. Above 6m and upto 30m linear waterway is known as minor bridge and more than 30m is known as major bridge.	2	
3.	Length + hook length = L + 18d.	2	
4.	40D to 45D where D is the dia of bar.	2	
5.	The fund which is gradually accumulated by way of periodic or annual deposit for the replacement of the building or structure at the end of its useful life is termed as Sinking fund.	2	10.
	PART. B.		

II

Description	N	L	B	H	Qty	Total Qty
Earthfilling Hall	1	2.65	4.95	0.35	4.59	
Bed & Toilet & work area portion	3	2.25	3.65	0.35	7.21	
Kitchen	1	2.65	2.25	0.35	2.09	13.89 m^3

2+2+2=6

2

Scoring Indicators **Code**

Version

Qn:No	Scoring Indicators	Split score	Total score
2.	Eaves length = 9.9 + 0.4 + 1.2 = 11.5m ✓ eaves span = 6 + 0.4 + 1.2 = 7.6 m. ✓ No of common rafter = $\frac{\text{Eave length}}{\text{spacing}} + 1$ ✓ $= \frac{11.5}{0.5} + 1 = 24$ Nos. ∴ No: of common rafter = 2 × 24 = 48 Nos. ✓	1 1 1 1	
	Description: Wood work Comm rafter — N: 48, L: 4.56, B: 0.05, H: 0.125, Qty: 1.368, ↑Qty: 1.368 m^3	2	6
3.	Length of CC, 0.6 × eves span = 0.6 × 7.6 = 4.56m		
	Description: ① RCC work 1:2:4 — N: 1, L: 4.8, B: 2.1, H: 0.2, Qty: 2.016 m^3	3	
	② Cement concrete work for wearing coat — N: 1, L: 4.00, B: 2.3, H: 0.1, Qty: 0.92 m^3	3	
4.	The joints of brick work shall be raked out to a depth of 20mm and the surface of the wall washed and cleaned and kept wet for two days before pointing. The materials of mortar cement and sand or lime and surki or ~~the~~ sand, or kankar lime as specified, shall of standard specification. The materials shall be first		6

Scoring Indicators **Code**

(2)

Version

Qn:No	Scoring Indicators	Split score	Total score
	dry mixed by measuring with boxes to have the required proportions as 1:2 or 1:3 for cement sand mortar 1:1 for lime surkhi mortar or kankar lime mortar; and then mixed by adding water slowly and gradually and thoroughly mixed. Mortar shall then applied in the joints slightly in excess and pressed by a proper tool of the required shape. Extra mortar if any is removed and surface finished. Mortar shall not spread over the face of bricks, and the edges of brick shall be clearly defined to give a neat appearance. After pointing the surface shall be kept wet for seven days. Flush pointing, Ruled pointing, weather or Truck pointing tucked pointing etc are the types of pointing.		6
5.	Clear span = 3.4m. Total = 3.4 + .2 + .2 = 3.8m 4 Nos 16mm ϕ bars. The length of straight bar both end hooked. = 3.8 − (2 × 0.025) + 18 × 0.016 = 4.038m ✓	1 2	
	Description: Quantity of steel 4 Nos 16mm ϕ — N: 4; L: 4.038; B: @; H: 1.58 kg/m; Qty: 25.520kg	3	6
6.	1. Buying or selling property 2. Taxation 3. Rent fixation 4. Security or loan or mortgage		

Scoring Indicators **Code**

Version

Qn:No	Scoring Indicators	Split score	Total score
	5. Compulsory aquisition 6. Valuation of a property is required for Insurance Betterment charges, speculation etc.	1x6	6.
7.	Cost of building = 625000. The rate of depreciation (rd) = 2% The value of building after 10 years. $D = P\left(\frac{100-rd}{100}\right)^n = 625000\left(\frac{100-2}{100}\right)^{10}$ $= \underline{510670.5}$ ✓ The amount of depreciation = 625000 − 510670.5 $= \underline{114329.5}$	3 3	6.
III	PART-C.		
a.	~~Eaves span = 6 + 1.4 + 1.2 = 8.6m~~ ~~effective span = 6 + 1.2 = 6.2m~~ ~~length of hip rafter = 0.78 × eff. span = 0.78 × 6.2~~ ~~= 5.928m~~ ~~1st collar = ½ effective span = ½ × 6.2 = 2.067m~~		
a.			

Description		N	L	B	H	Qty	TQty.
Painting doors and windows.							
Door	D.	1x2	1		2.1	4.2	
	D_1	5x2	0.9		2.1	18.9	
	D_2	1x2	0.8		2.1	3.36	3
Windows	W	5x2	1.5	1.5		22.5	
	W1	1x2	1.5	1.3		3.9	
	W2	2x2	1.2	1.5		7.2	3
							60.66m² ✓ 2 1

0.7

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Scoring Indicators (3) **Code** **Version**

Qn:No	Scoring Indicators	Split score	Total score
b.	Description N L B H Qty Total		
	brickwork in CM 1:5 for walls.		
	wall abutted 1 29.4 0.2 3 17.64		
	Cross wall 1 7.9 0.2 3 4.74		
	" 1 6.2 02 3 3.72		
	" 1 2.5 0.2 3 1.50		
	½ brick wall. 1 2.5 0.1 3. 0.75		
	28.35 ✓	5	
	Deductions for doors & windows.		
	Door D 1 1 0.2 2.1 0.42		
	D_1 5 0.9 0.2 2.1 1.89		
	D_2 1 0.8 0.2 2.1 0.336		
	Windows W 5 1.5 0.2 1.5 2.25		
	W_1 1 1.5 0.2 1.3 0.39		
	W_2 2 1.2 0.2 1.5 0.72		
	6.01		
	Total less deduction 22.34 m^2.	3	8
	OR.		
TU a.	N L B H Qty Total.		
	1. Precast RCC work for tank and soak pit		
	Roof cover of Tank. 1 2.4 1.3 0.075 0.234		
	Roof cover of soak pit 1 $\pi \times 1.4^2$ 0.075 0.115		
	Baffle wall 1 1 0.04 0.45 0.018		
	0.367 m^3	5	

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Scoring Indicators **Code**

Version

Qn:No	Scoring Indicators							Split score	Total score
V	2. Dry brickwork in soakpit.	1	$\pi \times 1.2$	0.20	2.5	1.88 m^3		2	15
	3. cement plastering 1:3								
	lank (long wall)	2	2		1.7	6.8			
	(Short wall)	2	0.9		1.7	3.06			
	floor	1	2.00	0.9	~~0.9~~	1.8			
						11.66 m^2		3+1	
	4. 50 mm aggregate								
	outer side of soakpit	1	$\pi \times 1.55$	0.15	2.5	1.825			
	at bottom	1	$\frac{\pi \times 1^2}{4}$		.2	0.157			
						1.982 m^3			
	Sand - outer outer								
	Side of Soakpit	1	$\pi \times 1.85$	.15	2.5	2.18 m^3		4	
	Module II								
	Description	N	L	B	H	Qty	Tally		
	1. Earthwork excavation								
	Abutment	2	5.10	0.70	0.60	4.28			
	wing walls	4	1.2	0.7	0.6	2.02			
						6.3 m^3		2	
	Plain cement concrete								
	Abutment	2	5.1	0.70	0.30	2.14			
	wing walls	4	1.2	0.7	0.3	1.01			
						3.15 m^3		2	
	2. First class brick work in CM 1:4								
	Abutment	2	4.8	0.4	1.5	5.76			
	wing walls	4	1.2	04	1.5	2.88			
	Parapet up to kerb	2	4.7	0.4	0.3	1.13			

Scoring Indicators (4) **Code** **Version**

Qn:No	Scoring Indicators							Split score	Total score
	Parapet above kerb.	2	4.7	0.3	0.5	1.41			
	Parapet at coping	2	4.9	0.4	0.1	0.39			
						11.57			
	Deduct Bearing of Rcc slab in abutmt	2	4.8	0.3	0.2	0.57			
	total less deducted					11.00	m^3	4	
	3. Steel bars including bending in Rcc work.								
	20 mm dia bars. main straight bars 30 cm c/c. No: $\frac{4.8}{0.3}+1=17$	17	2.38			40.46			
	Main bent up (No: $\frac{4.8}{3}=16$)	16	2.54			40.64			
		Total 81.10 @ 2.47				200.317	kg	3	
	10mm dia distributers 25cm c/c (at bottom) No: $\frac{2.1}{.85}+1=9$	9	4.9			44.1			
	at top	4	4.9			19.60			
		Total 67 @ 0.62 kg/m				39.49	kg.	3	
	Total Steel = 200.317 + 39.49								
	= 239.811 kg							1	15
VI	OR.								

Description	N	L	B	H	Qty	T Qty
Earthwork excavation in foundation						
Face walls	2	3.1	0.80	0.80	3.97	
Wing walls including portion	4	$\frac{2.3+1.8}{2}$	$\frac{0.8+0.7}{2}$	0.8	4.92	

Scoring Indicators **Code**

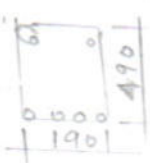
Version

Qn:No	Scoring Indicators							Split score	Total score
	Wing wall triangular corner	4	$\frac{1}{2}\times\frac{0.8}{0.8}$		0.8	0.77			
	Turn walls	4	$\frac{.95+.8}{2}$	.7	0.8	1.96			
	Under pipe	1	9.80	3.10	0.16	4.56			
						16.18	m^3	7	
	2. Cement concrete 1:4:8 in foundation face walls	2	3.1	0.8	0.3	1.488			
	Wing wall inclined portion	4	2.05	0.75	3	1.85			
	Wing walls triangular corner	4	0.24		.3	0.288			
	Turn walls	4	0.875	.7	.3	0.735			
	Upper pipe and between pipe up to half height	1	9.8	3.1	.5	15.19			
						19.551			
	Deduct half of pipes	3	$9.8\times\frac{1}{2}\left(\frac{11}{4}\times.7^2\right)$			5.66			
			Total less deduction			13.891	m^3	8	15
VII	Module III								
	Description	N	L	B	H	Qty			
	RCC work (excluding steel and its bending but including curing and shuttering etc complete	1	6.1	0.25	0.55	0.839	m^3	2	

Scoring Indicators **Code**

(5) **Version**

Qn:No	Scoring Indicators	Split score	Total score
	2. Steel bars including bending Main bo straight bar 22mm ϕ @ 2.98kg/m 2 6.416 @ 2.98. 38.25 kg	2	
	Bent up bar 2 6.936 @ 2.98 41.34 kg.	2	
	Anchor bar 16mm ϕ 2 Nos @ 1.58 kg/m. 2 6.308 @ 1.58 19.93 kg	2	
	Stirrups 8mm ϕ 15cm c/c at ends 13 Nos each and at centre 21cm c/c 11 Nos. - 37 Nos @ 0.62 kg/m. 37 1.66 @ 0.62 38.68 kg.		
	137.6 kg	2	
	= 1.376 quintal		

Description of bar	Shape of bar	length of each (m)	No	Total length	wt in kg.
1. Main Straight		6.416	2	12.832	38.25
2. Main bent up		6.936	2	13.872	41.34
3. Anchor bar		6.308	2	12.616	19.93
4. Stirrups.		1.660	37	61.42	38.68
					137.60kg. 5

15

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Scoring Indicators **Code**

Version

Qn:No	Scoring Indicators	Split score	Total score
VIII	1. Brick masonry :- Quality and Size of bricks - properties and specifications of mortar - Soaking of bricks in water - Setting of bricks in mortar - Thickness of joints - bond - raking joints for plaster - Uniform raising - maximum height for a days work - scaffolding - throating - corbelling and cornices - rounding off corners - plinth offsets - bricks on edge coping - Curing - Unit of measurement and payment.	6+1	9
	2. Form work for RCC. Cement concrete 1:1½:3 Materials - Coarse aggregate, fine aggregate, cement, water - proportion - Hand mixing - machine mixing - form work - laying and consolidation. - Curing - Unit IV	8.	
IX	a. Straight line method :- In this method the property loses its value by the same amount every year. A fixed amount of the original cost is deducted every year.		

Scoring Indicators (6) **Code** **Version**

Qn:No	Scoring Indicators	Split score	Total score
	Annual depreciation = D = $\frac{\text{Original cost} - \text{Scrap value}}{\text{life in years.}}$ $= \frac{C-S}{n}$ where C original cost, S scrap value 3 n - life of property in years.		
	Constant percentage method :- In this method the property will close its value by a constant percentage of its value at the biginig of every year.		
	Annual Depreciation $D = 1-\left(\frac{S}{C}\right)^{1/n}$ where S, C, and D are scrap value, original cost and depreciation.		
	depreciated at the end of 1st year $= C - DC = C_1$		
	11nd year $= C_1 - DC_{12}$ and so-on.		
	Depreciated Cost of end of the m year $= C\left(\frac{C}{S}\right)m$ when the value of S=0		
	the ratio $\frac{S}{C}$ is very small, the depreciation of 1st year may be considerable.	3+1	7
b.	1. Rental method of valuation :- In this method the net income by way of rent is found out by deductions all outgoings from the gross rent. A suitable rate of interest as prevailing in the market is assumed and years purchase is calculated. This net income is multiplied by years purchase gives capitalized value or valuation of property.		

Scoring Indicators **Code**

Version

Qn:No	Scoring Indicators	Split score	Total score
	2 Direct comparison with the capital value :- This method may be adopted when rental value is not available from the property concerned, but there are evidences of sale price of properties as whole. In such case the capitalised value is compared with capitalized value of similar property in the locality. 3 Valuation based on profit :- This method of valuation is suitable for buildings like hotels, cinema theatres etc for which the capitalized value depends on profit. 4 Valuation based on cost :- In this method actual cost incurred in constructing the building or possessing the property is taken as basis to determine the value of property. 5 Development method of valuation :- In this method the valuation is used for the properties which are in the undeveloped stage or partly developed and partially undeveloped stage. The land is to be divided into plots after providing for roads, parks etc. 6 Depreciation method of valuation :- The building is divided into four parts. such as walls, Roofs, floor, doors & windows. The life of each parts in worked first with the present day rates		

Scoring Indicators (7) **Code** **Version**

Qn:No	Scoring Indicators	Split score	Total score
	by detailed measurements. The depreciated value of each parts is calculated $D = P\left(\frac{100-rd}{100}\right)^n$. when P = cost at present market rate, rd is the fixed percentage of depreciation. n is the number of the years the building had been constructed.	2x4 =	8.
	Unit-IV OR		
14 a.	1. Scrap value :- When the life of the building is over, after its utility period, the dismatled material such as bricle, timber, steel etc will fetch certain amount which is called scrap value. The estimated value of scrap value is about 10% of construction cost.	2	
	2. Salvage value :- It is the estimated value of the property, at the the end of its life period without being dismatled. The salvage value can be increased by renovation.	2	
	book value :- This is the value shown in the account book in that particular year. In other words book value is the original cost minus depreciation till that value. book value reduced year after year and reaches the scrap value at the end of its life period.	2+1	7

Scoring Indicators **Code**

Version

Qn:No	Scoring Indicators	Split score	Total score
X.b.	Plinth area rate = 2500/m².		
	Cost of building at present market rate = 250 × 2500 = 625000	2	
	rate of depreciation = 2%		
	present value of building = $P\left(\frac{100-rd}{100}\right)^n$	1	
	$= 625000 \times \left(\frac{100-2}{100}\right)^{20} = 417255.$	2	
	Add cost of land = 450 × 1200 = 540000	2	
	present value of property = 417255 + 540000		
	= ₹. 957255/-	2	8