

CLASS: - SIXTH SEMESTER – CIVIL ENGINEERING (NEW SCHEME)
SUBJECT: - STEEL STRUCTURES DESIGN.

Max. Marks: - 100

Time Allowed: - 3 hours

Instructions for candidate:-

1. Attempt any five Questions.
2. Use of B.I.S.800 & Steel tables is allowed
3. Assume suitable data wherever necessary.

Q. No	QUESTION	MARKS
1 (a)	State two advantages and disadvantages of using structural steel in Civil Engineering Constructions.	04
(b)	The 2 – ISA 100 X 75 X 12 mm is connected to the web of ISWB 600 @ 1423.4 N/m with longer side connected to the web by using PDFR of 12 mm ϕ . Calculate the strength of joint, pitch & efficiency. Draw its neat sketch.	16
2 (a)	Calculate throat thickness for single V and double V butt weld between two members 20 mm thick each	05
(b)	A tie member in a roof truss consists of a pair of angles ISA 90 X 60 X 10 mm welded on either side of a gusset plate 12 mm thick through the longer legs. Design the welded joint if permissible stresses in angles & fillets are 150 N/mm ² & 108 N/mm ² respectively.	15
3	A discontinuous double angle strut in a roof truss of length 1.85 m carries a compressive load of 150 KN. The angles are placed back to back on the same side of gusset plate 10 mm thick. Design a suitable equal angle section for the member. Also design riveted end connection using 18 mm diameter PDSR and draw its neat sketch showing all the details Assume $f_y=250\text{N/mm}^2$	20
4 (a)	Calculate the strength of ISA 75 X 50 X 6 mm, when it is used as a tension member with its longer leg connected by 16 mm diameter rivets. Assume $f_y=280\text{ N/mm}^2$	10
(b)	Calculate the strength of a tie member made up of 2 – ISA 150 X 115 X 10 mm when they are placed back to back with their longer legs connected on same side of a gusset plate, tacking of rivets has been carried. ($\phi = 20\text{ mm}$). Assume $f_y=280\text{ N/mm}^2$	10
5 (a)	Define the terms of roof truss: (i) Span (ii) Pitch (iv) Slope (iv) Principle rafter (v) Purlin	05
(b)	Design a suitable section for a steel column of 4.2 m unsupported length carrying a load of 480 KN. The ends of the column are effectively held in position & restrained against rotation at both the ends. Assume $f_y = 280\text{ N/mm}^2$	15
6	Design a tension member consisting of a pair of angles placed back to back and connected them by the shorter legs to the same side of gusset plate. The member is to carry a pull of 250 KN. Also design riveted end connection using 18 mm diameter PDSR and draw its neat sketch showing all the details. Assume $f_y = 250\text{ N/mm}^2$	20
7(a)	Explain the specifications for providing tacking of rivets	04
(b)	Calculate the safe load carrying capacity of a double angle discontinuous strut composed of 2 – ISA 100 X 75 X 6 mm placed back to back & connected on the same sides of a gusset plate 8 mm thick by one rivets at ends. The actual length of the strut is 2.15 m. Assume $f_y = 250\text{ N/mm}^2$	16
8	Design a simply supported beam subjected to a uniformly distributed load of 30 KN/m over an effective span of 5.75 m. The compression flange of the beam is laterally restrained throughout its span. Apply all the checks. Assume $f_y=320\text{ N/mm}^2$ & $E = 2.1 \times 10^5\text{ N/mm}^2$	20

9 (a)	Draw a neat sketch of the connections showing various details and parts between: (i) Purlins and the roofing material (ii) principal rafter and the purlins	6x
(b)	Explain briefly the different types of column bases.	08
10(a)	Explain briefly the design of masonry wall foundation.	08
(b)	What are laterally supported beams? What is the necessity of providing bearing plates under the beams?	12

SIXTH SEMESTER – CIVIL ENGINEERING (NEW SCHEME)
SUBJECT: - STEEL STRUCTURES DESIGN

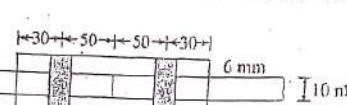
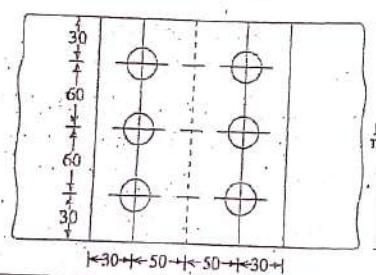
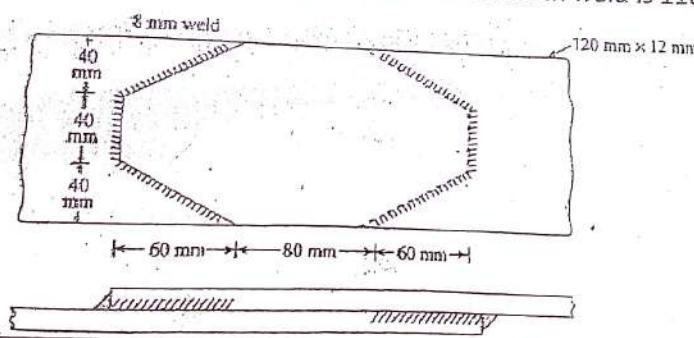
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Max. Marks: - 100

Time Allowed: - 3 hours

Instructions for Candidate:-

1. Attempt any Five Questions
2. Use of I.S.800 and Steel Table is allowed.
3. Assume suitable data wherever required.
4. USE BLUE PEN ONLY.

Q. No	QUESTION	MARKS
1 (a)	What is a Plate Girder? Give three locations where Plate Girders are usually used.	05
(b)	<p>Two Plates 180 x 10 mm each are connected by a double cover butt joint with 16 mm diameter rivets as shown in figure below. The cover plates are 6 mm thick. Determine the design strength of the driven rivets. $f_y = 260$</p>  	15
2 (a)	Draw the plan of a Double Cover Triple Riveted Butt Joint between two plates of 16 mm thickness.	05
(b)	<p>Two Plates 120 x 12 mm in size are connected by a 8 mm size fillet weld as shown in figure below. Calculate the strength of this joint if permissible stress in weld is 110 N/mm².</p> 	15
3 (a)	Distinguish between Chain Riveting and Diamond Riveting.	05
(b)	Design a Tension Member to carry a Load of 250 KN. Use 20 mm diameter power driven shop rivets for connection of the member to the gusset plate. $f_y = 280$ N/mm ²	15
4 (a)	Calculate the area of a Compression Member consisting of 2ISA 100 x 100 x 10 mm connected by 20 mm diameter pds rivets to a 8 mm thick gusset plate.	05
(b)	An ISMB 400 @ 61.6 Kg/m is used as a Column with a length of 6.5 m. It is effectively held in position and unrestrained against rotation at each end. Determine the safe load this member can carry if the yield stress of steel is 450 N/mm ²	15
5 (a)	A Column consists of ISJB 225 @ 12.8 Kg/m with both ends fixed. Calculate the length upto which it will act as a short column.	05
(b)	Two angles ISA 90 x 60 x 8 mm are used as a discontinuous strut 3 m long and connected to 10 mm thick gusset plate by two rivets at each end. Determine the design strength of the strut for the following cases:-	15

	i. When the longer legs of the angles are connected on either side of gusset plate. ii. When the longer legs of the angles are connected on same side of gusset plate. Take $f_y = 400 \text{ N/mm}^2$	
6 (a)	Two plates of size $500 \times 12 \text{ mm}$ are connected together by a riveted connection with a maximum allowed load of 750 KN . Calculate the efficiency of joint if $f_y = 280 \text{ N/mm}^2$	
, (b)	A double angle strut has a length of 3.5 m centre to centre. The member is subjected to a force of 440 KN . Design the Strut if angles are placed on same side of a 10 mm thick gusset plate connected through a fillet weld. Take permissible stress in the weld as 100 N/mm^2 , $f_y = 380 \text{ N/mm}^2$	15
7 (a)	What are the advantages of providing a Steel Beam over an RCC Beam?	05
(b)	A simply supported beam has an effective span of $5 \cdot 1 \text{ m}$ has to support a load of 60 KN/m excluding its self weight. The compression flange of the beam is restrained against buckling. Design the beam and check it for Shear and Deflection. $f_y = 320 \text{ N/mm}^2$	15
8 (a)	Sketch the connection between a Base Plate and a Column in a Column Base.	05
(b)	A Tension member of a truss consists of $2 \text{ ISA } 200 \times 150 \times 12 @ 31.8 \text{ Kg/m}$ provided on either side of a 12 mm thick gusset plate. Connection consists of a fillet weld 5 mm size with permissible stress in weld as 105 N/mm^2 . Determine the tensile strength of the member if $f_y = 300 \text{ N/mm}^2$	15
9 (a)	Explain the function of Vertical and Horizontal Stiffeners in a Plate Girder.	05
(b)	Design the Wall Foundation of a Two Storey Building with wall thickness 230 mm . The walls support a load of 140 KN/m . SBC and Unit Weight of Soil are 140 KN/m^2 and 18 KN/m^3 respectively Angle of repose is 35° .	15
10 (a)	Which type of joint has more efficiency – Riveted or Welded? Explain Why?	05
(b)	Draw front elevation of the connection between a beam and a column connected by a seated connection from the following data:- 1. Stanchion = ISHB 600 @ 1202.7 N/m 2. Beams = ISMB 300 @ 433.6 N/m 3. Cleat Angles = ISA 90 x 90 x 8 4. Seat Angles = ISA 150 x 115 x 10	15

Class : 6th Semester (New Scheme)
 Branch : Civil Engineering / PHE(Civil) Engineering
 Subject : STEEL STRUCTURES DESIGN
 M. Marks : 100

Roll No.

645

Time : 3 Hours

Note: Attempt any FIVE questions. Use of I.S.800 and Steel Table is allowed. Assume suitable data wherever required.

Q1.

(a) Give the advantages and disadvantages of Welded Connections.

(b) A Tie member in a roof truss consists of two ISA 90 x 60 x 8mm. Determine the safe load carrying capacity of the member if:

(i) It is connected by sufficient number of 20 mm diameter rivets at ends

(ii) It is connected by suitable weld at each end.

(05,15)

Q2.

(a) Explain stepwise procedure for Erection of a Steel Roof Truss at Site.

(b) A Double Riveted Double Cover Butt Joint is used to connect two plates 12 mm thick. Determine the diameter of rivets, rivet value, pitch and efficiency of the joint. Adopt the permissible stresses as: $T_{rf} = 102 \text{ N/mm}^2$, $\sigma_{pf} = 230 \text{ N/mm}^2$ and $\sigma_{at} = 150 \text{ N/mm}^2$. (05,15)

Q3.

(a) Explain Plug and Slot Welds..

(b) An equal angle ISA 75 x 75 x 10 @ 11 Kg/m is subjected to a load of 180 KN whose line of action passes through the centroid of the section which is at 2.22 cm from the heel. The angle is to be welded to a gusset plate. If the size of the weld is to be 8 mm, find the length of side fillet welds. (06,14)

Q4.

(a) List various elements of a Plate Girder and give the function of each.

(06,14)

Q4.

(b) A single angle discontinuous strut consisting of ISA 100 x 100 x 8 has a length of 2.5 m. Determine the safe load it can carry if it is connected by two rivets at each end. What will be the change in its load carrying capacity if the member is continuous? Take $f_y = 260 \text{ N/mm}^2$.

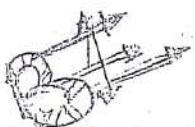
Q5.

(a) Sketch the connection between Principal Rafter and a Purlin in a Roof Truss.

(b) A column is 6 m long and adequately restrained in position and direction at both ends. The column has to carry a load of 600 KN excluding its self weight. Design a suitable steel section. Take $f_y = 280 \text{ N/mm}^2$. (06,14)

Q6.

(a) Give the Physical Properties of Structural Steel.



(b) A Tie member in a roof truss is 1.95 m long and carries an axial load of 250 KN. Design a suitable unequal double angle section with longer legs outstand and connected on each side of 12 mm thick gusset plate and tacked along the length. $f_y = 250 \text{ N/mm}^2$. (05,15)

Q7.

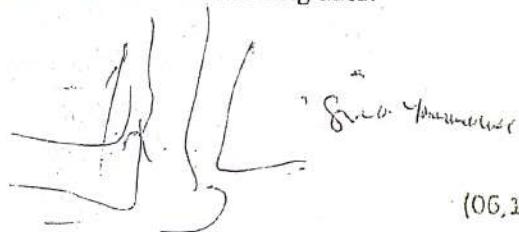
(a) Design a Simply Supported Beam to carry a uniformly distributed load of 44 KN/m exclusive of its self weight. The effective span of beam is 8 m. The effective length of the compression flange of beam is also 8 m. The beam is laterally supported. Take $f_y = 260 \text{ N/mm}^2$, $E = 20 \times 10^5 \text{ N/mm}^2$. Apply all checks. (20)

Q8.

(a) Explain the concept of Failure of a Steel Column.

(b) Two horizontal beams are radiating from a stanchion and are connected by seated connection. Show the details of joint in front elevation from the following data:

1. Stanchion = ISHB 600 @ 1202.7 N/m
2. Beams = ISMB 300 @ 433.6 N/m
3. Cleat / Seat Angles = ISA 90 x 90 x 8.



(06,14)

Q9.

(a) Sketch various Patterns of Riveting.

(b) A Room measuring 3.0 x 3.6 m clear has 30 cm wall all round. Load transferred to the foundation is 100 KN per running meter. Bearing Capacity of soil at 1 meter depth 150 KN/Sqm. Plinth is to be kept 800 mm above the ground level. Design a suitable section for the Wall Footing. Angle of repose is 30°. Density of soil is 180 KN/Cum. (05,15)

Q10.

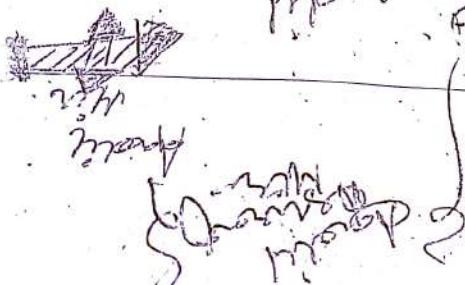
(a) Give the Assumptions in Theory of Riveted Connection.

(b) A double angle strut having a length of 2.5 m centre to centre is subjected to an axial force of 465 KN. Design the strut if angles are placed on same side of 12 mm thick gusset plate. Take $f_y = 320 \text{ N/mm}^2$. (05,15)

Ans - Q7 & Q8

Ans - Q9 & Q10

Ans - Q10



ROLL NO.

CLASS: - 6TH SEMESTER – CIVIL ENGINEERING (NEW SCHEME)
SUBJECT: - STEEL STRUCTURES DESIGN.

861701162

Max. Marks: - 100

Time Allowed: - 3 hours

Instructions for candidate:-

1. Attempt any five Questions.
2. Use of B.I.S.800 & Steel tables is allowed
3. Assume suitable data wherever necessary. USE BLUE PEN ONLY.

Q. No	QUESTION	MARKS
1(a)	State three physical & chemical properties of structural steel? Give the difference between the use of IS 800 – 1984 and IS 800 - 2007	06
1(b)	Design a riveted connection using PDSR for a tie member in a truss bridge, which consists of 2 ISA 100 X 80 X 8 mm placed back to back on both sides of a gusset plate 10 mm thickness connected by a longer leg subjected to an axial load of 100 KN? Draw its neat sketch	14
2 (a)	Draw a sketch showing shear failure of a rivet in axial tension in case of double cover butt joint. Comment the type of shear failure.	05
2 (b)	A tie member in a roof truss consists of a pair of angles ISA 90 X 60 X 10 mm welded on either side of a gusset plate 12 mm thick through the longer legs. Design the welded joint if permissible stresses in angles & fillets are 150 N/mm^2 & 108 N/mm^2 respectively.	15
3 (a)	State the technical reason for considering Gross Area of a member for analysis of Compression members as against Net Area in Tension members.	05
3 (b)	A discontinuous double angle strut in a roof truss of length 2.15 m carries a compressive load of 180 KN. The angles are placed back to back on the same side of gusset plate 8 mm thick. Design a suitable unequal angle section for the member. Assume $f_y=250 \text{ N/mm}^2$	15
4 (a)	Explain how the net area of an angle section is calculated when connected by both of its legs with proper sketches.	04
4 (b)	Calculate the strength of a tie member made up of 2 – ISA 150 X 115 X 10 mm when: <ol style="list-style-type: none"> (i) Placed back to back with their longer legs connected on both sides of a gusset plate. (ii) Placed back to back with their longer legs connected on same side of a gusset plate, tacking of rivets has been carried. ($\phi = 20 \text{ mm}$) 	16
5 (a)	Draw a neat sketch showing various parts of a roof truss.	04
5 (b)	Design a suitable section for a steel column of 3.5 m unsupported length carrying a load of 500 KN. The ends of the column are effectively held in position & restrained against rotation at both the ends. Assume $f_y=280 \text{ N/mm}^2$	16
6 (a)	How will you calculate the net area, when angles are connected through both the legs with staggered rivets? Illustrate with example.	05
6 (b)	Design an unequal angle section for a tie member in a King post truss subjected to an axial load of 150 KN. Also design riveted end connection using 18 mm diameter PDSR. Assume $f_y=250 \text{ N/mm}^2$	15
7(a)	Explain the functions of Bearing and Horizontal stiffeners in a plate girder	06
7(b)	Calculate the safe load carrying capacity of a double angle discontinuous strut composed of 2 – ISA 90 X 60 X 8 mm placed back to back & connected on both sides of	14

K.T.O.

	a gusset plate 8 mm thick by two rivets at ends. The actual length of the strut is 2.0 m. Assume $f_y = 250 \text{ N/mm}^2$	
8	Design a simply supported beam carrying an udl of 30 KN/m over an effective span of 6.5 m, in addition to udl it carries a point load of 50 KN at its center. The compression flange of the beam is laterally restrained throughout its span. Apply all the checks. Assume $f_y = 300 \text{ N/mm}^2$ & $E = 2 \times 10^5 \text{ N/mm}^2$	20
9 (a)	Draw the front and side elevations of the connection between a beam and a column connected by a seated connection from the following data : Stanchion = ISHB 300 @ 576.8 N/m Beam = ISLB 250 @ 273.7 N/m Cleat angles = 2 - ISA 90 X 90 X 8 mm Nominal diameter of the rivets = 20 mm	14
(b)	Explain briefly the fabrication & erection of steel structures.	06
10(a)	Explain the importance of following terms in foundation design: (a) Thickness of concrete bed block (b) Width of foundation	08
(b)	Derive a relation for having an idea about the economic spacing of trusses.	12

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RollNo:

11
70

Branch: Civil/PHE/QSCM Sub: Steel Structure Design

Time: 3 hrs. Max Marks: 100 Scheme: New Sem: 6

Instructions: 1) Attempt any 5 questions.

2) Use only blue pen.

3) Use of IS - 800 and steel table is allowed



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- Q1 a: Name the different types of rolled steel sections available in the market. Also write their applications. (5)
- b: Define structural steel and give its physical and mechanical properties? (5)
- c: A member of roof truss consists of two ISA 100x80x8 mm placed back to back on both sides of a gusset plate of 10mm thickness. It carries a load of 80000N. Determine number of power driven rivets required for joint? (10)
- Q2 a: A single riveted double cover butt joint in plates 12mm thick is made with 20mm diameter rivets at a pitch of 90mm. Find the safe load per pitch length of the joint. Also find the efficiency of the joint. Take $\tau_{vf}=100\text{N/mm}^2$, $\sigma_{pt}=300\text{N/mm}^2$, and $\sigma_{at}=150\text{N/mm}^2$? (10)
- b: What are the defects in weld? Explain them briefly. (5)
- c: List the different welding processes. (5)
- Q3: Calculate the strength of a tie member made up of 2-ISA 125x75x8mm when:
A) placed back to back with their longer leg connected on both sides of a gusset plate by 22mm diameter rivets.
B) placed back to back with their longer leg connected on the same side of a gusset plate by 22mm diameter rivets. (20)
- Q4 a: What are the various types of sections used as tension members? (10)
b: Determine the strength of ISNT 100 which is used as a tie member when connected through its flange with 18mm diameter rivets. Take permissible tensile stress = 150N/mm^2 ? (10)
- Q5: Find the safe load carrying capacity of a discontinuous strut ISA 80 x 50 x 6 mm, if it is connected by two rivets at each end. (20)
- Q6: A discontinuous double angle strut in a roof truss of length 1.85 m carries a compressive load of 150 kN. The angles are placed back to back on the same side of gusset plate 10 mm thick. Design a suitable equal angle section for the member. Also design riveted end connection using 18 mm diameter PDSR and draw its neat sketch showing all the details assume $f_y=250\text{N/mm}^2$. (20)
- Q7a: Derive a relation for having an idea about the economic spacing of trusses. (10)
b: Define effective length of column and give its effective length for different end conditions? (10)
- Q8 a: Design a suitable ISHB column to carry a load of 450 kN. The column is 4.5m long and is effectively held in position at both ends, but not restrained against rotation. Assume the safe compressive stress as 80 N/mm^2 . (20)
- Q9: Design a simply supported beam carrying an udl of 30 kN/m over a effective span of 8m, in addition to udl it carries a point load of 50 kN at its center. The compression flange of the beam is laterally restrained throughout its span. Apply all the checks. Assume $f_y=250\text{N/mm}^2$, $E = 200000\text{ N/mm}^2$. (20)
- Q10 a: Write important considerations in fabrication and erection of steel structure. (5)
b: Write the typical erection steps of multi-storey building. (5)
c: Explain the importance of following terms in foundation design: (a) thickness of concrete bed block (b) width of foundation (10)

CLASS: - SIXTH SEMESTER – CIVIL ENGINEERING (NEW SCHEME)
SUBJECT: - QUANTITY SURVEYING AND VALUATION.

Max. Marks: - 100

Time Allowed: - 4 hours

Instructions for candidate:-

1. Attempt any Four Questions including Q No. 1 which is Compulsory.
2. Assume suitable data where ever required.

Q. No	QUESTION	MARKS																											
1	Estimate the quantity following items of work from the Residential Building details of which are shown in Figure:- 1 (Any Four Items) <ol style="list-style-type: none"> 1. Earthwork in Excavation for Foundation Trenches 2. First class brick work CM (1:4) in Superstructure. 3. Reinforced Cement Concrete work (1:2:4) 4. Internal Wall & Ceiling Plaster in CM (1:3). 5. Damp Proof Course - 40 mm thick of cement concrete (1:2:4) 	10 x 4																											
2	Calculate the quantity of Earthwork of a hill road in side along ground from RD 0 to 700 with the following data:- Formation Width = 8 m Side slope in Banking is 2: 1 Side slope in Cutting is 1: 1 Downward Gradient = 1 in 200 Transverse Slope of Ground = 1 in 5 Formation Width at RD 0 = 203.500 m <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">Station</td> <td style="width: 10%;">1011</td> <td style="width: 10%;">1012</td> <td style="width: 10%;">1013</td> <td style="width: 10%;">1014</td> <td style="width: 10%;">1015</td> <td style="width: 10%;">1016</td> <td style="width: 10%;">1017</td> <td style="width: 10%;">1018</td> </tr> <tr> <td>Chainage in meters</td><td>0</td><td>100</td><td>200</td><td>300</td><td>400</td><td>500</td><td>600</td><td>700</td></tr> <tr> <td>R.L of ground</td><td>202.5</td><td>201.97</td><td>201.35</td><td>199.66</td><td>200.5</td><td>202.91</td><td>202.94</td><td>202.52</td></tr> </table>	Station	1011	1012	1013	1014	1015	1016	1017	1018	Chainage in meters	0	100	200	300	400	500	600	700	R.L of ground	202.5	201.97	201.35	199.66	200.5	202.91	202.94	202.52	20
Station	1011	1012	1013	1014	1015	1016	1017	1018																					
Chainage in meters	0	100	200	300	400	500	600	700																					
R.L of ground	202.5	201.97	201.35	199.66	200.5	202.91	202.94	202.52																					
3 (a)	Calculate the quantities of materials required for RCC Work in Lintel (1:1.5:3) – Quantity = 15 Cum	10																											
(b)	Explain the following:- i. Tender Form ii. Retention Money iii. Two Cover Bid	3,3,4																											
4 (a)	Prepare the Rate Analysis for First Class Brickwork in Foundation in 1:4 cement sand mortar including supply of material, labour, tools etc. The total quantity of work is 165 cum. Adopt latest market rates.	14																											
(b)	Explain Sinking Fund and Year Purchase	3 x 2																											
5 (a)	Prepare the Preliminary Estimate of a three storied Office Building having total carpet area of 2500 Sqm from the following data. It may be assumed that 35% of the built up area shall be taken up by corridors, verandah, lavatories and staircases etc. <ol style="list-style-type: none"> i. Plinth Area Rate – Rs 3500 per Sqm ii. Extra due to deeper foundation at site – 1.2% of Building Cost iii. Extra for special Architectural Treatment – 0.5 % of Building Cost iv. Extra for water supply and sanitary installation – 9 % of Building Cost v. Extra for internal electric installation – 13% of Building Cost vi. Extra for other services – 4 % of Building Cost vii. Contingencies – 2.5 % viii. Supervision Charges – 10% 	12																											
(b)	Explain the classification and types of construction companies.	08																											
6	Prepare an Estimate of a Septic Tank for 50 users details of which are given in Figure – 2. The Septic Tank is to be made of first class brickwork in 1:4 over cement concrete (1:3:6) in foundation and base with RB partition wall and RCC Slab cover. Inside of the tank including floor shall be 12 mm thick plain cement plaster (1:2) mixed with water proofing material.	20																											
7(a)	Determine the total valuation of a property developed on a land of 1200 Sqm. The built up area is 35 x 50 m. The building is first class type and provided with water supply, sanitary and electric installations. The age of building is 25 years. The cost of land may be taken as Rs 2500/- per sqm, and the plinth area rate of the building including all its utility services be taken as Rs 2000/- per sqm.	12																											
(b)	Prepare the Rate Analysis for White Washing – 2 Coats including supply of material, labour, tools etc. The total quantity of work is 850 Sqm. Adopt latest market rates.	08																											

CLASS: - SIXTH SEMESTER – CIVIL ENGINEERING (NEW SCHEME)
SUBJECT: - QUANTITY SURVEYING AND VALUATION.

Max. Marks: - 100

Time Allowed: - 4 hours

Instructions for candidate:-

1. Attempt any Four Questions including Q No. 1 which is Compulsory.
2. Assume suitable data where ever required.

Q. No	QUESTION	MARKS																											
1	Estimate the quantity following items of work from the Residential Building details of which are shown in Figure:- 1 (Any Four Items) 1. Earthwork in Excavation for Foundation Trenches 2. First class brick work CM (1:4) in Superstructure. 3. Reinforced Cement Concrete work (1:2:4) 4. Internal Wall & Ceiling Plaster in CM (1:3). 5. Damp Proof Course - 40 mm thick of cement concrete (1:2:4)	10 x 4																											
2	Calculate the quantity of Earthwork of a hill road in side along ground from RD 0 to 700 with the following data:- Formation Width = 8 m Side slope in Banking is 2: 1 Side slope in Cutting is 1: 1 Downward Gradient = 1 in 200 Transverse Slope of Ground = 1 in 5 Formation Width at RD 0 = 203.500 m <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Station</th><th>1011</th><th>1012</th><th>1013</th><th>1014</th><th>1015</th><th>1016</th><th>1017</th><th>1018</th></tr> </thead> <tbody> <tr> <td>Chainage in meters</td><td>0</td><td>100</td><td>200</td><td>300</td><td>400</td><td>500</td><td>600</td><td>700</td></tr> <tr> <td>R.L of ground</td><td>202.5</td><td>201.97</td><td>202.35</td><td>199.66</td><td>200.5</td><td>202.91</td><td>202.94</td><td>202.52</td></tr> </tbody> </table>	Station	1011	1012	1013	1014	1015	1016	1017	1018	Chainage in meters	0	100	200	300	400	500	600	700	R.L of ground	202.5	201.97	202.35	199.66	200.5	202.91	202.94	202.52	20
Station	1011	1012	1013	1014	1015	1016	1017	1018																					
Chainage in meters	0	100	200	300	400	500	600	700																					
R.L of ground	202.5	201.97	202.35	199.66	200.5	202.91	202.94	202.52																					
3 (a)	Calculate the quantities of materials required for RCC Work in Lintel (1:1.5:3) – Quantity = 15 Cum	10																											
(b)	Explain the following:- i. Tender Form ii. Retention Money iii. Two Cover Bid	3,3,4																											
4 (a)	Prepare the Rate Analysis for First Class Brickwork in Foundation in 1:4 cement sand mortar including supply of material, labour, tools etc. The total quantity of work is 165 cum. Adopt latest market rates.	14																											
(b)	Explain Sinking Fund and Year Purchase																												
5 (a)	Prepare the Preliminary Estimate of a three storied Office Building having total carpet area of 2500 Sqm from the following data. It may be assumed that 35% of the built up area shall be taken up by corridors, verandah, lavatories and staircases etc. i. Plinth Area Rate – Rs 3500 per Sqm ii. Extra due to deeper foundation at site – 1.2% of Building Cost iii. Extra for special Architectural Treatment – 0.5 % of Building Cost iv. Extra for water supply and sanitary installation – 9 % of Building Cost v. Extra for internal electric installation – 13% of Building Cost vi. Extra for other services – 4 % of Building Cost vii. Contingencies – 2.5 % viii. Supervision Charges – 10%	3 x 2 12																											
(b)	Explain the classification and types of construction companies.	08																											
6	Prepare an Estimate of a Septic Tank for 50 users details of which are given in Figure – 2. The Septic Tank is to be made of first class brickwork in 1:4 over cement concrete (1:3:6) in foundation and base with RB partition wall and RCC Slab cover. Inside of the tank including floor shall be 12 mm thick plain cement plaster (1:2) mixed with water proofing material.	20																											
7(a)	Determine the total valuation of a property developed on a land of 1200 Sqm. The built up area is 35 x 50 m. The building is first class type and provided with water supply, sanitary and electric installations. The age of building is 25 years. The cost of land may be taken as Rs 2500/- per sqm and the plinth area rate of the building including all its utility services be taken as Rs 2000/- per sqm.	12																											
(b)	Prepare the Rate Analysis for White Washing – 2 Coats including supply of material, labour, tools etc. The total quantity of work is 850 Sqm. Adopt latest market rates.	08																											

Class : 6th Semester (New Scheme)
 Branch : Civil Engineering / PHE (Civil) Engineering
 Subject : QUANTITY SURVEYING AND VALUATION
 M. Marks : 100

Roll No.

Time : 3 Hours

Note: Attempt FOUR questions in all by selecting three questions from Part A and Part B i.e. Q7 is Compulsory. Assume any missing data / specification required suitably.

Q1.

(a) Distinguish clearly between:

PART-A

- (i) Plinth area estimate and cubic rate estimate
- (ii) Preliminary estimate and detailed estimate

(b) Write the units of measurement and rate of payment of any five of the following:

- (i) AC sheet roofing
- (ii) Painting Door
- (iii) Cut Stone work
- (iv) Cornice work
- (v) Iron and Steel work
- (f) Steel Girder

(10,10)

Q2.

Calculate the materials required for constructing the following items of works of building project:

(i) Ten number of concrete blocks 1:2:4 size 80 cm x 40 cm x 20 cm.

5 5

(ii) Cement plaster 1:3 (12 cm thick) cement sand mortar for 120 square metre area.

5

$$10 \times 0.8 \times 0.4 \times 0.2 = 0.024$$

(10,10)

Q3. What do you mean by Valuation. Write the names of various methods of valuation and describe any two of them.

(20)

Q4. (a) Differentiate between Security Deposit and Retention Money.

(b) Write the essential qualification of a contractor.

(10,10)

Q5. (a) Work out the quantity of stone masonry for retaining wall 100 metre long 60 cm top width 3.6m high with 1:3 batter on front face and back face vertical.

(b) Work out the analysis of rates for brick masonry work in cement mortar 1:4 in superstructure. Adopt fresh market rates.

(10,10)

Q6. Write short notes on:

(a) Detailed specification for earthwork in foundation

5

(b) Running and maintenance cost of construction equipment.

(10,10)

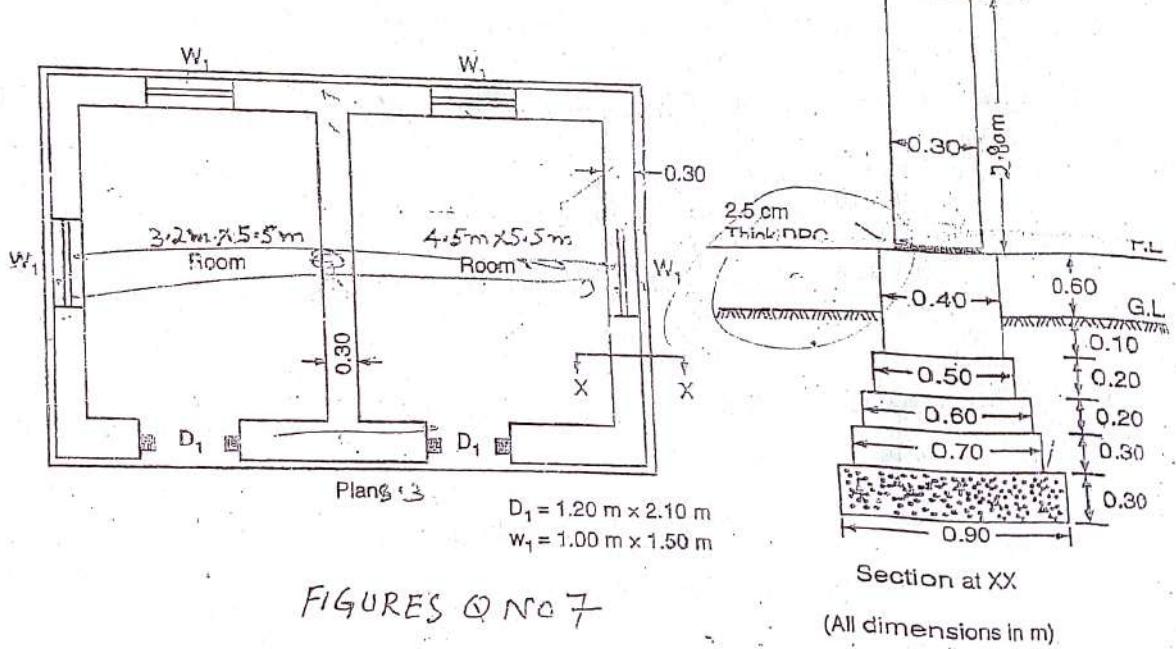
P.B.P.
478

PART-B

Q7. Estimate the quantities of the following items of a two roomed building from the given plan and section.

- (a) Earthwork in Excavation in foundation
- (b) Lime concrete in Foundation
- (c) First class brick work in cement mortar 1:4 in foundation and plinth
- (d) 2.5 cm cement concrete DPC
- (e) First class brickwork in cement mortar 1:6 in superstructure

(40)



FIGURES Q NO 7

ROLL NO: 3201-101164710

861601303

CLASS: - SIXTH SEMESTER - CIVIL ENGINEERING (NEW SCHEME)
SUBJECT: - QUANTITY SURVEYING AND VALUATION.

Max. Marks: - 100

Instructions for candidate:-

Time Allowed: - 3 hours

1. Attempt any Four Questions including Q No. 1 which is Compulsory.
2. Assume suitable data where ever required.
3. USE BLUE PEN ONLY.

Q. No	QUESTION	TOTAL PAGES - 3										
		MARKS										
1	Estimate the following items of work from the Residential Building details of which are shown in Figure:- 1. 1. Earthwork in backfilling for foundation trenches. 2. First class brick work CM (1:4) IN Superstructure. 3. Reinforced Cement Concrete work (1:2:4) 4. External Plaster in CM (1:3) for walls and plinth.	10 x 4										
2 (a)	Figure: - 2 shows the Longitudinal and Cross Section of a Simply Supported Beam of clear span 5 meters. The thickness of supporting walls is 30 cm. Prepare the Bar Bending Schedule and work out the quantity of reinforcement in the beam.	15										
(b)	Distinguish between Scrap Value and Salvage Value	05										
3 (a)	Calculate the quantities of materials required for the following: 1. Half Brickwork in cement mortar 1 : 4 for 500 m ² 2. Reinforced Cement Concrete 1 : 2 : 4 for 350 m ³	04 x 2										
(b)	Explain the following:- i) Contract Documents ii) Negotiated Contract .iii) Types of Contracting Firms	04 x 3										
4 (a)	Work out the Rate for First Class Brickwork in Superstructure in CM (1:4). The total quantity of brickwork is 240 cum. Adopt fresh market rates. Also calculate the quantity of each material required for the work.	14										
(b)	What is a Tender Notice? List the particulars that need to be given in a Tender Notice.	06										
5	Figure: - 03 shows the details of a Septic Tank for 50 Users. Prepare the Detailed Estimate for the same for following items only:- 1. Earthwork in Excavation 2. First Class Brickwork in CM (1:4) 3. RCC Work 4. 12 mm thick Internal Plaster in CM (1:3)	05 x 4										
6	Reduced Levels of ground along the centre line of a proposed road from chainage 0 to 200 are given below. The formation level at 40 m chainage is 102.750. The formation width of road at the top = 12 m and Side slope in Banking is 1.75 : 1. Prepare an estimate of Earthwork for the road	20										
	Chainage in meters	0	20	40	60	80	100	120	140	160	180	200
	R.L. of ground	101.5	100.90	101.50	102.00	102.85	101.65	101.95	100.70	101.25	99.90	100.60
	RL of Formation			102.75								
	Gradient	Rising Gradient 1 : 40				Falling Gradient 1 : 100						
7(a)	Write down the detailed specification of the following items: i) Terrazo Flooring ii) Internal Plastering of walls and Ceiling	05 x 2										
(b)	Explain the following terms:- i) Sinking Fund ii) Rental Return Method	05 x 2										

K.T.O

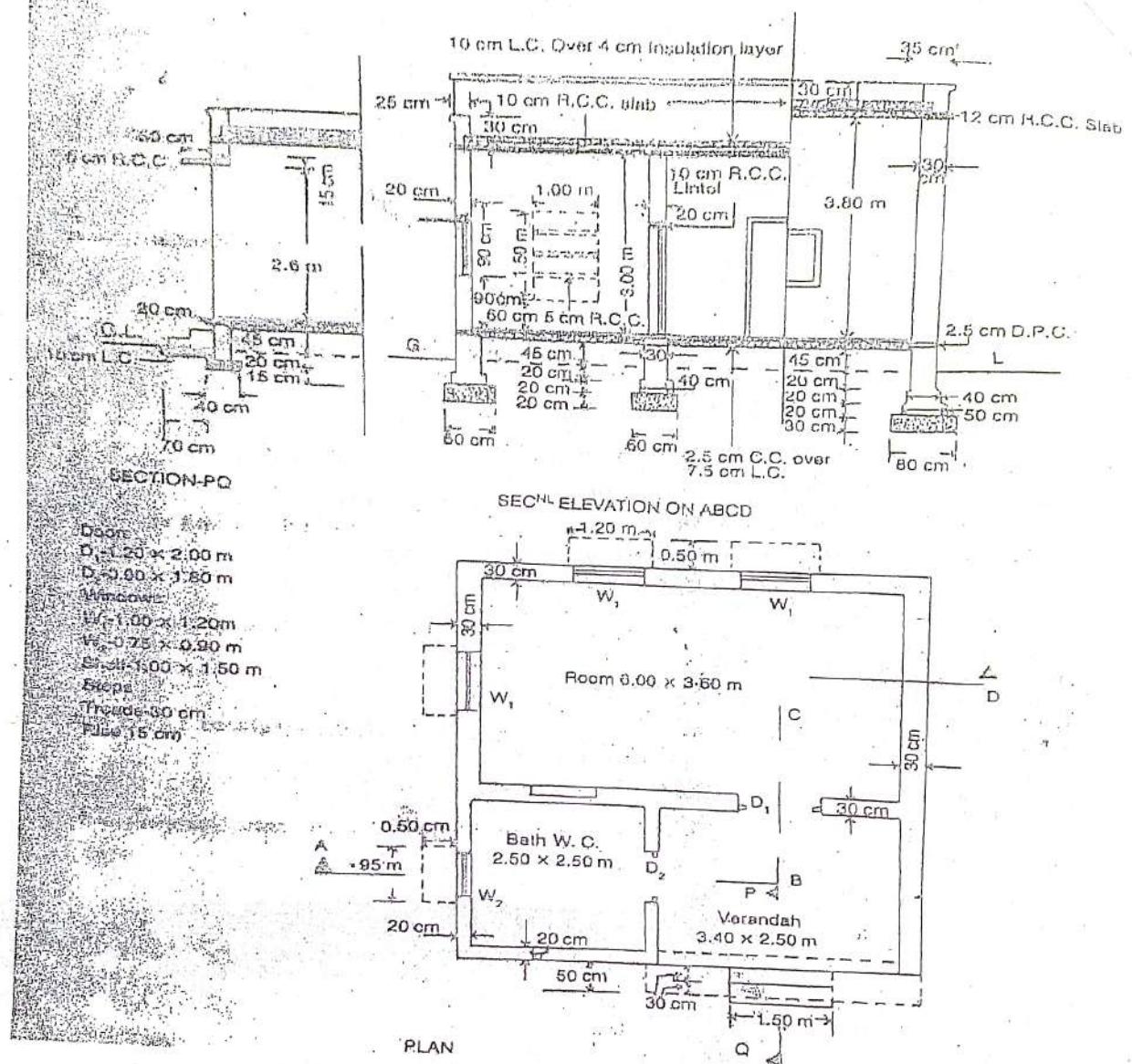


FIGURE - 01 (Q. No: - 01)

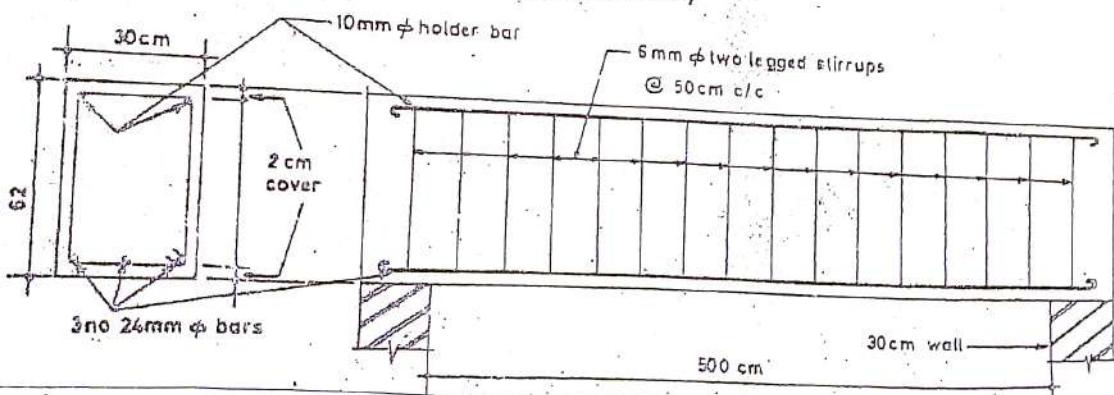


FIGURE - 02 (Q. No: - 02)

Max. Marks: - 100

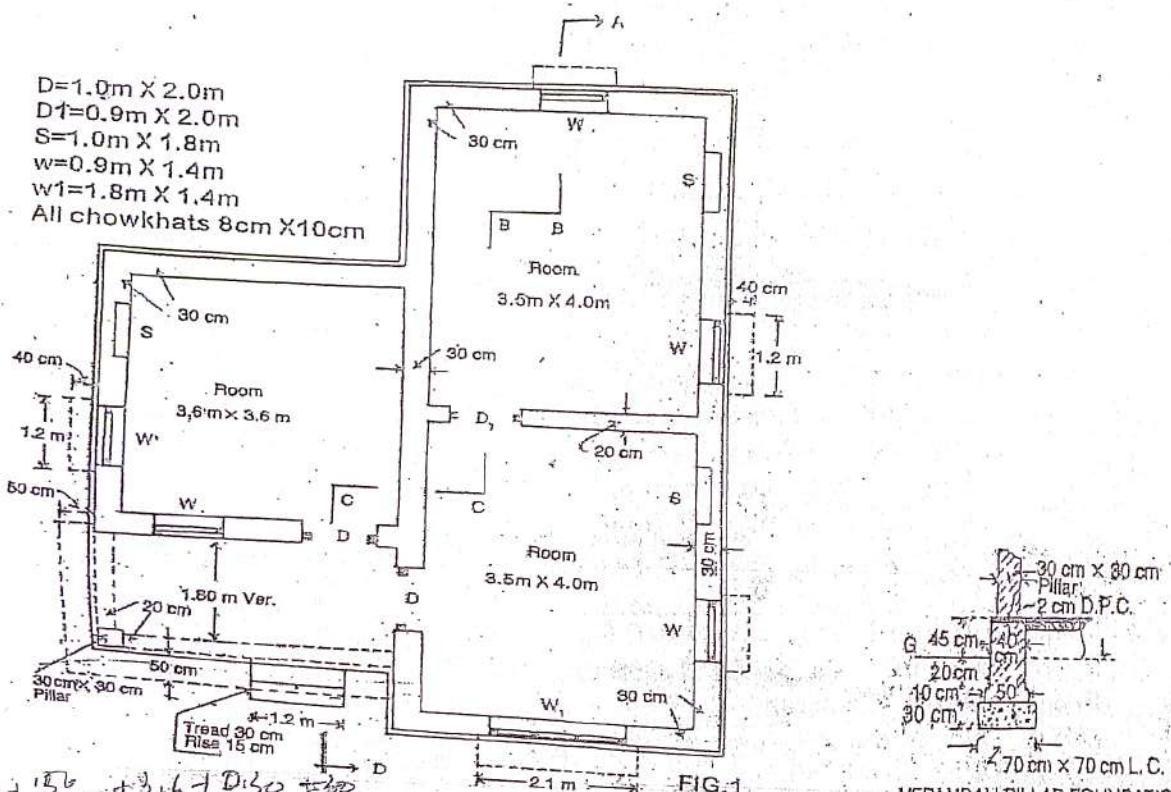
Instructions for candidate:-

Time Allowed: - 3 hours

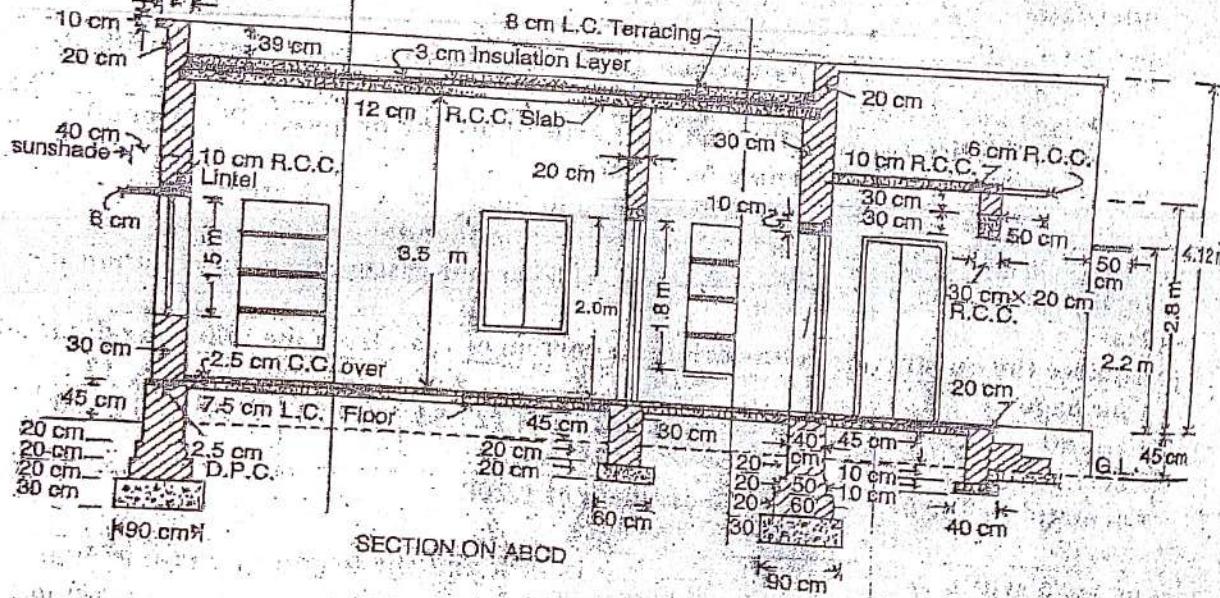
1. Attempt four questions. Q No. 1 is compulsory
2. Assume suitable data wherever necessary. USE BLUE PEN ONLY.

Q. No'	QUESTION	MARKS																																				
	Estimate the quantities of the following items of work for the building given in Fig 1 (i) Earthwork in excavation (ii) Brickwork in foundation and plinth (iii) 12mm thick inside plastering (iv) Wood work in chowkhatas of doors and windows (v) RCC work in slab and lintels	8X5																																				
2(a)	Define estimate. Explain briefly its various types. How do they differ from each other?	10																																				
(b)	Write down the units of measurement for the following items of work: (i) Bending and binding of steel reinforcement. (ii) Sawing of timber (iii) Door handles (iv) Damp proof course (v) Cutting of trees(Girth specified)	5																																				
(c)	Differentiate between Long wall short wall and Centre line method of taking measurements.	5																																				
3(a)	What is a contract? List its various types. Explain Item rate contract with its advantages and disadvantages.	10																																				
(b)	Prepare a 'Notice Inviting Tender' for Earth filling the proposed Playground in the campus of Govt. Polytechnic Baramulla.	10																																				
4(a)	Distinguish between brief specification and detailed specification. Write the detailed specification for cement concrete work in foundation.	10																																				
(b)	Explain principles of valuation. Discuss replacement cost method of valuation in detail.	10																																				
5	Estimate the quantity of earthwork for a portion of road from the following data: <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">Chainage</td> <td style="width: 10%;">5</td> <td style="width: 10%;">6</td> <td style="width: 10%;">7</td> <td style="width: 10%;">8</td> <td style="width: 10%;">9</td> <td style="width: 10%;">10</td> <td style="width: 10%;">11</td> <td style="width: 10%;">12</td> </tr> <tr> <td>Ground Level</td> <td>129.45</td> <td>129.35</td> <td>129.30</td> <td>129.42</td> <td>129.84</td> <td>129.72</td> <td>129.65</td> <td>129.60</td> </tr> <tr> <td>Formation Level</td> <td></td> <td></td> <td></td> <td>129.75</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Formation Level</td> <td>130.00</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> Downward gradient of 1:200	Chainage	5	6	7	8	9	10	11	12	Ground Level	129.45	129.35	129.30	129.42	129.84	129.72	129.65	129.60	Formation Level				129.75					Formation Level	130.00								20
Chainage	5	6	7	8	9	10	11	12																														
Ground Level	129.45	129.35	129.30	129.42	129.84	129.72	129.65	129.60																														
Formation Level				129.75																																		
Formation Level	130.00																																					
	The road width at the formation surface is 10m and the length of chain is 30m. Side slope in banking is 2:1 and in cutting is 1.5:1 and there is a vertical drop in ground at the 8 th chainage.																																					
6	Analyze the rates for the following items of work: (i) 10 cum of RCC work in slabs (1:2:4) with 1% mild steel bars (ii) 100 sqm of 12 mm thick plastering 1:4	2X10																																				
7(a)	Estimate the quantities of materials required for a 30 cm thick 1 st class brick masonry compound wall of length 500m and height 3m in 1:6 cement mortar.	10																																				
(b)	Differentiate between Earnest money and retention money.	05																																				
(c)	Write a short note on 'Preparation of comparative statement'.	05																																				

$D=1.0\text{m} \times 2.0\text{m}$
 $D_1=0.9\text{m} \times 2.0\text{m}$
 $S=1.0\text{m} \times 1.8\text{m}$
 $w=0.9\text{m} \times 1.4\text{m}$
 $w_1=1.8\text{m} \times 1.4\text{m}$
 All chowkhats 8cm X 10cm



VERANDAH PILLAR FOUNDATION



Rollno:

861801591

Branch:-Civil/PHE Sub: Quantity surveying and Valuation
 Time: 3 hrs. Max Marks: 100 Scheme: New Sem: 6
 Instructions: 1) Assume Suitable Data Where ever required
 2) Use only blue pen.

3) Attempt any 4 Questions including Q1 which is Compulsory



MARKS

Q. No	QUESTION	MARKS																																				
1	Estimate the quantities of the following items of work for the building given in Figure (i) Earthwork in excavation (ii) Brickwork in foundation and plinth (iii) 12mm thick inside plastering (iv) Wood work in chowkhas of doors and windows (v) RCC work in slab and lintels.	3 X 5																																				
2	Estimate the quantities of the following items of work for the Septic tank given in Figure (i) 1 st class brickwork in 1:4 cement mortars in septic tank. (ii) Earthwork in excavation. (iii) Cement concrete 1:3:6 in floor and foundation. (iv) 12 mm cement plaster to whole.	3 X 4																																				
3(a)	Explain briefly the following terms: (i) Record Drawings. (ii) Standard Measurement Book.	5																																				
(b)	Define estimate. Enlist its types? Under what circumstances revised estimate of a project is carried out?	5																																				
(c)	Prepare a preliminary estimate of a building project with a total plinth area of all buildings of 1500 sq. m. Given that: (i) Plinth area rate --- Rs 950.00 per sq. m (ii) Extra for special architectural treatment --- 1.5% of building cost (iii) Extra for water supply & Sanitary treatment --- 5% of building cost (iv) Extra for internal installations --- 14% of building cost. (v) Extra for services --- 6% of building cost. (vi) Contingencies --- 3% (vii) Supervision charges --- 3%	10																																				
4(a)	Estimate the quantities of materials for the following items of work: (i) 10 cum of RCC work in slabs (1:2:4) with 1% mild steel bars (ii) 100 sq. m of 12 mm thick plastering 1:3	5 X 2																																				
(b)	Write down the units and payment of measurement for the following items of work: (i) Stone work in wall facing or lining (Thickness specified). (ii) Sawing of timber. (iv) Barbed wire fencing. (iii) Bituminous road surfacing. (v) Supply of Paint ready mix	10																																				
5	Estimate the quantity of earthwork for a portion of road having formation width as 10m, side slopes are 2:1 in banking & 1:5:1 in cutting from the following data. Draw its Longitudinal Sketch: <table border="1"> <thead> <tr> <th>Distance m</th> <th>0</th> <th>100</th> <th>200</th> <th>300</th> <th>400</th> <th>500</th> <th>600</th> <th>700</th> <th>800</th> <th>900</th> <th>1000</th> </tr> </thead> <tbody> <tr> <td>R.L. of ground</td> <td>114.5</td> <td>114.75</td> <td>115.25</td> <td>115.2</td> <td>115.1</td> <td>116.1</td> <td>116.8</td> <td>118.0</td> <td>118.25</td> <td>118.1</td> <td>117.8</td> </tr> <tr> <td>P.L. of formation</td> <td>115</td> <td></td> </tr> </tbody> </table> upward gradient of 1 in 200 Downward gradient of 1 in 400	Distance m	0	100	200	300	400	500	600	700	800	900	1000	R.L. of ground	114.5	114.75	115.25	115.2	115.1	116.1	116.8	118.0	118.25	118.1	117.8	P.L. of formation	115											20
Distance m	0	100	200	300	400	500	600	700	800	900	1000																											
R.L. of ground	114.5	114.75	115.25	115.2	115.1	116.1	116.8	118.0	118.25	118.1	117.8																											
P.L. of formation	115																																					
6(a)	Work out the analysis of rates for 1.2 cum of reinforced brick work (R.B. Work) with 1:3 cement mortars. Calculate its rate per cubic meter. Adopt fresh market rates	10																																				
(b)	Explain briefly running & Maintenance cost of construction equipment.	10																																				
7(a)	Define the following: (i) Single and Two cover bid. (ii) Types of contracts (iii) Qualities of a good contractor. (iv) Security Deposit (v) Retention money.	5 X 2																																				
(b)	Define the following terms related to valuation: (i) Sinking fund. (ii) Salvage value. (iii) Scrap Value. (iv) Year's purchase (v) Fair rent	10																																				
8(a)	Write a short note on 'Preparation of comparative statement'.	15 X 2																																				
(b)	Write down the detailed specification of the following works: (any two) (i) Reinforced cement concrete. (ii) Earthwork in excavation in foundation.	15 X 2																																				

3.75

Figure for Q No. 1

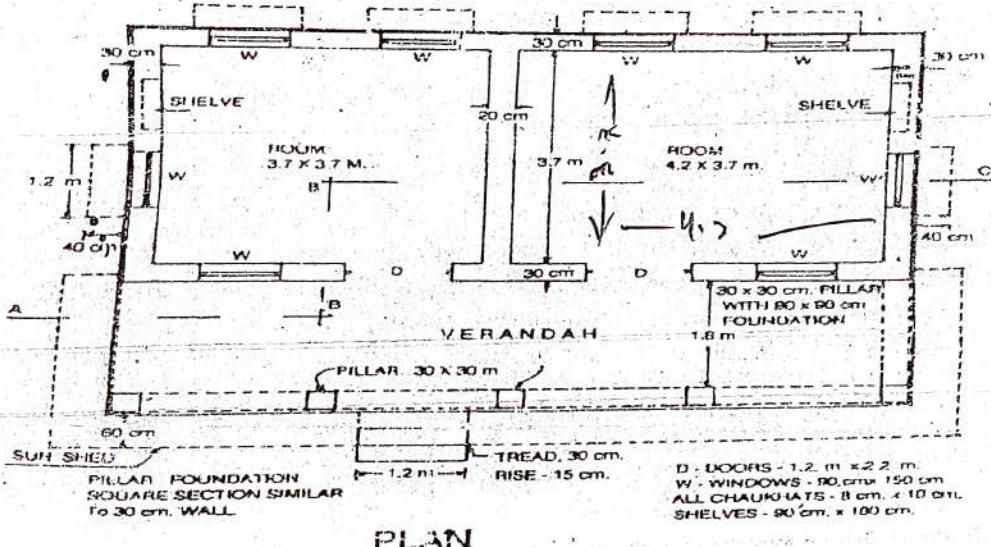
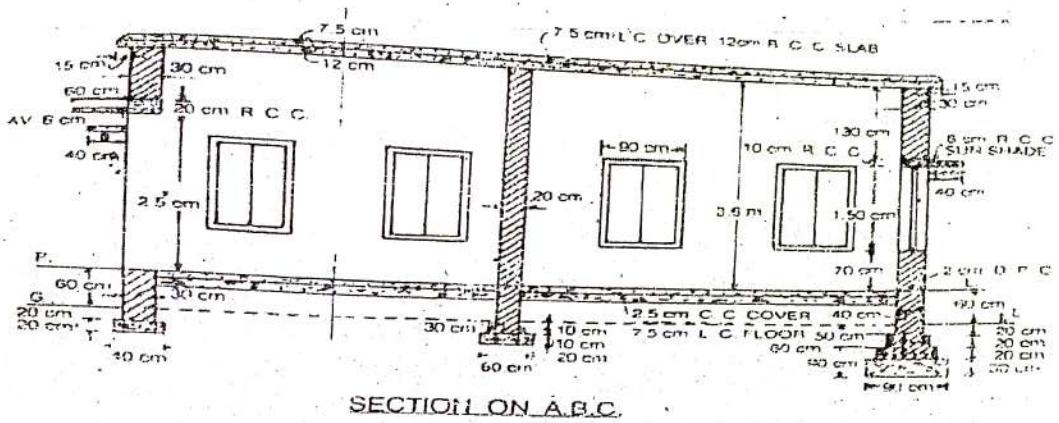
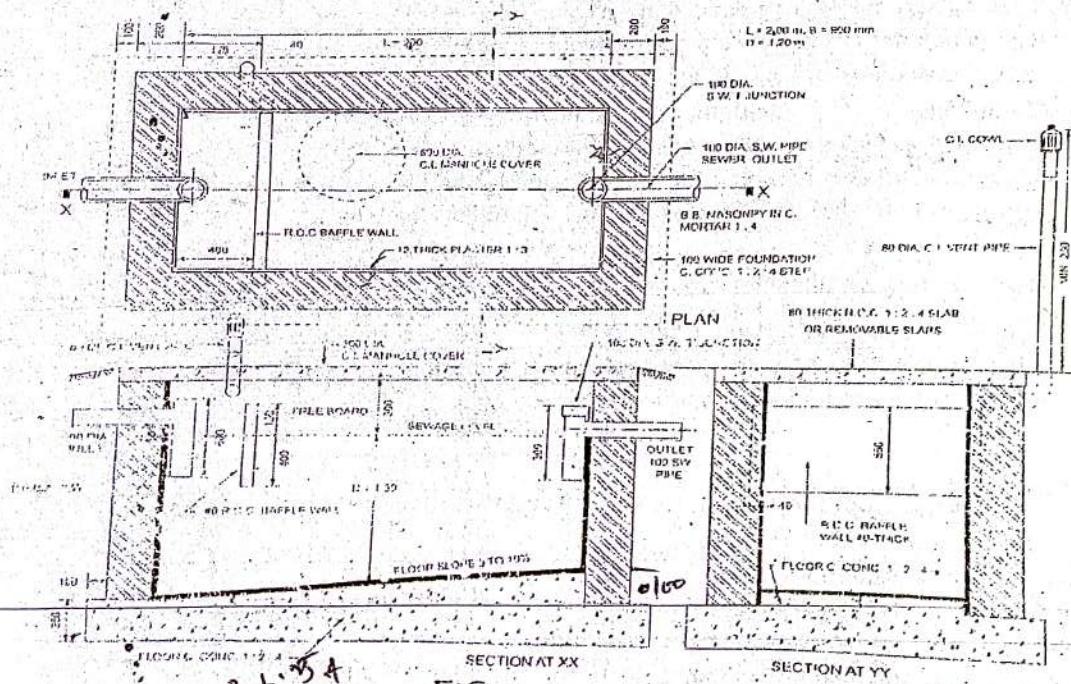


Figure for Q No. 2



$$\frac{S}{100} = \frac{P}{B} \quad t_{e-0} = \frac{\$Q}{100} \cdot 0.5$$

MJ-12

Class: 5th Semester

Branch: Civil Engineering

Subject: Quantity Surveying and Valuation

Max Marks: 100

Roll No:

Time : 3 Hours

80 marks
Numerical

Note: Attempt any five questions. All questions carry equal marks.

Q1. (a) Define estimate. Give the main items of building work and explain first four of them.

(b) Pen down the different types of estimates and explain in detail the detailed estimate. (10,10)

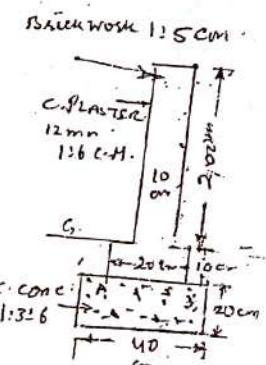
Q2. A road is to be constructed in hilly area with formation width of 10m in banking and 8m in cutting side slope in cutting is 1½:1 and side slope in banking is 2:1. The height of filling or the depth of cutting at the centre of the road and the cross slopes of the ground at intervals of 30m are as given below. Calculate the quantities of earthwork for the length of 210m. Rate (20)

Chainage	Depth of Cutting	Ht. of banking	Cross slope of the ground
0	60	--	10:1
30	70	--	12:1
60	50	--	15:1
90	40	--	12:1
120		70	10:1
150	--	60	15:1
180	--	80	12:1
210		90	10:1

Q3. Analysis the rates for 7.5 cm thick lime conc in floor. Analysis the rates for half brick wall (10 cm thick partition wall), with 1:3 cement mortar. Analysis the rates for 12mm plastering 1:6 cement mortar. (20)

Q4. (a) Calculate the quantity of material for the following:

(i) A fore wall around the park 105m x 65m whose cross section is given.



(ii) Give the method of calculating the material for cement concrete floor for 2.5 cm cement concrete for 100 sq. m proportion 1:2:4 (10,10)

Q5. (a) Define contract and write the qualities of a good contractor and their qualification.

(b) Explain the following terms:

- | | | |
|-----------------------------------|--------------------|-----------------------|
| (i) Security Money | (ii) Earnest money | (iii) Retension money |
| (iv) Single and two cover-bids | (v) Tender | (vii) Tender notice. |
| (viii) Tender forms and documents | | |

(07,13)

Q6. Write down the detailed specifications for the following items:

- | | |
|---|------------------------|
| (i) Masonary work 1 st class | (ii) R.C.C work |
| (iii) Damp proofing 2.5 cm | (iv) Pointing (Cement) |

(20)

Q7. Write down the complete procedure for inviting Tenders (for example for earth work).

(20)

Q8. (a) Define purpose of valuation and principles of valuation.

(b) Explain the following terms:

- | | | |
|-------------------|-------------------|-------------------------------|
| (i) Depreciation | (ii) Sinking fund | (iii) Salvage and scrap value |
| (iv) Market value | (v) Fair rent | |

(10,10)

Q9. (a) Explain the methods of building estimate

- (i) Centre line method (ii) Long wall short wall method.

(b) Write down the units of measurement of the following:

- | | | |
|---|------------------------------------|---|
| (i) Puddle clay core m^3 | (ii) Blasting of rock m^3 | (iii) Thin partition wall m^2 |
| (iv) Capping m^2 | (v) Brick on edge m^2 | (vi) Stone work in wall facing m^2 |
| (vii) Sawing of timber m^2 | (viii) Threading | (ix) Iron hold fast |
| (x) Iron work in truss = $\frac{\text{kg}}{\text{sq ft}}$ | | |

(10,10)

Q10. From the given figure calculate the quantities of the items:

- | |
|---------------------------------|
| (i) Earth work in foundation |
| (ii) Cement conc. in foundation |
| (iii) Brick work in foundation |

(20)

MJ-13

Class: 5th Semester

Branch: Civil Engineering

Subject: Quantity Surveying and Valuation

Max Marks: 100

Roll No:

Time: 3 Hours

Note: Attempt any FIVE questions. All questions carry equal marks.

Q1.

(a) Discuss detailed estimate and annual maintenance estimate. ✓

(b) Write down the units of measurement of the following:

(i) Boulder m^3 / $per m^3$ (ii) Drip course m / $per m$ (iii) Shelves m^2 / $per m^2$

(iv) Eave board m^2 / $per m$ (v) Hand rails m / $per m$ (10,10)

Q2.

Calculate the quantity of cement concrete and prepare a bar bending schedule for an R.C.C slab roof provided over a room with the following data:

Size of room $4.80 \times 4.20 M$

Bearing of slab on each side 15cm and thickness of slab 15cm.

Provide 10mm ϕ bars cranked from one side 8cm c/c both ways end bars will be straight bars.

Provide 3bars on each side as extra for holding the cranked portion. (20)

Q3.

(a) Calculate the quantities of materials for 75mm thick cement concrete flooring 1:4:8 with brick blast. (20)

(b) Calculate the quantities of materials required for brick work in cement motor 1:6. (10,10)

Q4.

Prepare detailed analysis of rate for brick work in cement motor 1:5 in super structure unit (10,10)

$10cm \rightarrow 10m^3$

Q5.

The ground level at various chainages along the center line of a proposed road are as under: (20)

Chainage

21

22

23

24

25

Ground level R.L (m) : 180.50

183.36

185.52

187.10

186.50

The ground has uniform cross slope of 1 in 8. The chain is 30m long . The road formation is proposed at uniform gradient passing through the G.L at end chain age with formation width is 8m and side slope of cutting as 1:1. Estimate the quantity of earth work for the proposed road section in a tabular form.

Q6.

(a) Define contracts and essential of contracts .

(b) Difference between security deposit and retention money.

(c) Explain lump sum contract and its advantages.

(20)

7.2
2.5
2
7.65

Q. Explain the following terms:

Q8

(a) Define valuations and principles of valuation.

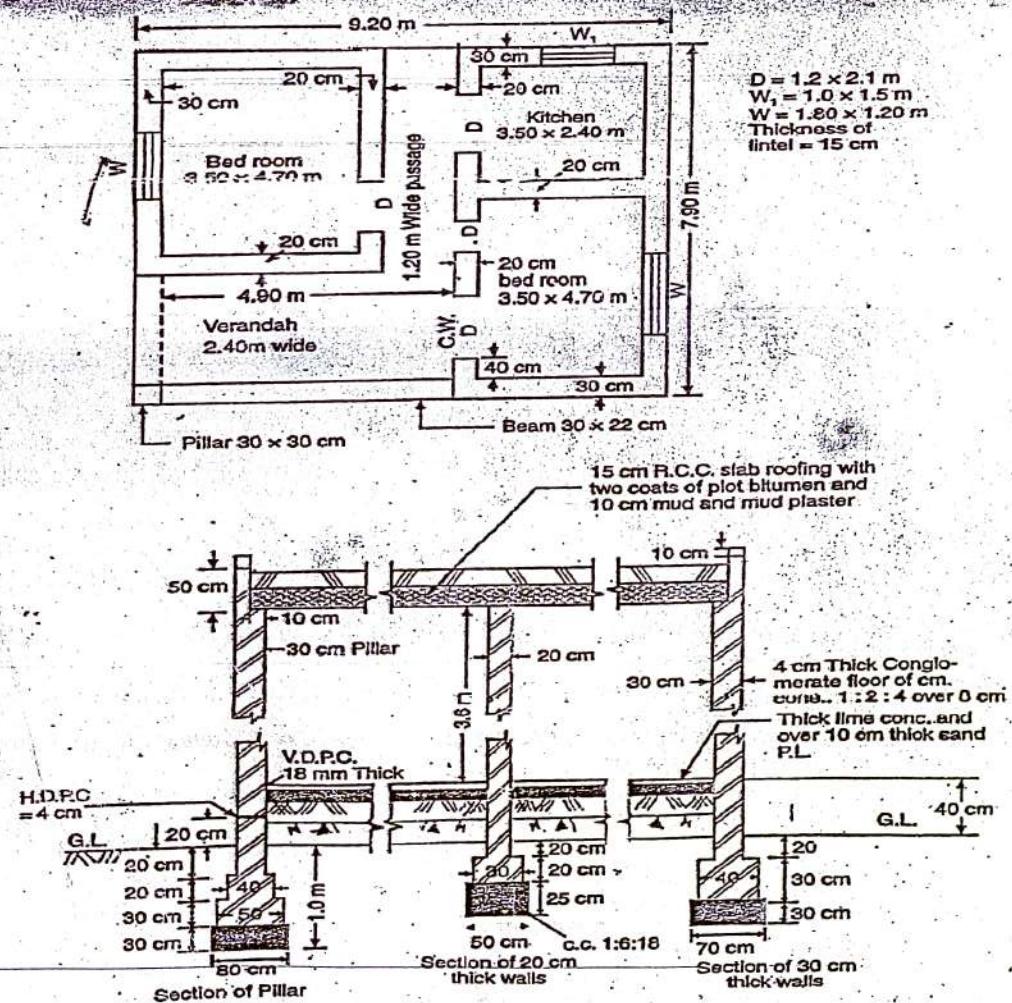
(b) Calculate the value of years purchase for a property of its life is 20 years and the rate of interest is 5% for sinking fund. The rate of interest is 4.5%. (08,12)

Q9. Write short note on :

- (a) Comparative statement of tender
 - (b) Tender form
 - (c) Balanced and unbalanced tender.
 - (d) Capitalised value

Q10. Prepare a detailed estimate of a given fig. (a).

- (a) Earth work in foundation.
 - (b) Cement concrete in foundation.
 - (c) D.P.C.



CLASS: - FIFTH SEMESTER – QUANTITY SURVEYING & CONST. MANAGEMENT (NEW SCHEME)

SUBJECT: - BASIC QUANTITY SURVEYING & VALUATION

Max. Marks: - 100

Time Allowed: - 4 hours

Instructions for candidate:-

1. Attempt any FOUR Questions including Q No. 1 which is Compulsory.
2. Assume suitable data where ever required.

Q. No	QUESTION	MARKS																												
1	<p>Calculate the quantities of following items for a residential building as shown in Fig. 01 and enter these in a Measurement Sheet (Attempt only 4 items)</p> <p>i) P.C.C (1:3:6) in foundation Trenches ii) Earthwork in Back Filling of Foundation Trenches iii) Ist Class Brickwork in Superstructure in CM 1:4 iv) Reinforced Cement Concrete Work v) External Wall Plaster 20 mm thick in CM 1:3</p>	10 x 4																												
2	<p>Reduced Levels of Ground along the centre line of proposed road from chainage 10 to 20 are given below. Formation Level at Chainage 10 is 107 m. The Road is in downward gradient of 1 in 150 up to chainage 14 and then gradient changes to 1 in 100 downwards. Formation Width of the road is 10 m. Side slope in cutting is 1.5:1 and that in banking is 2:1. Length of chain is 30 m.</p> <table border="1"> <tr> <td>Chainage</td> <td>10</td> <td>11</td> <td>12</td> <td>13</td> <td>14</td> <td>15</td> </tr> <tr> <td>NSL</td> <td>105</td> <td>105.6</td> <td>105.44</td> <td>105.9</td> <td>105.42</td> <td>104.3</td> </tr> <tr> <td>Chainage</td> <td>16</td> <td>17</td> <td>18</td> <td>18</td> <td>20</td> <td></td> </tr> <tr> <td>NSL</td> <td>105</td> <td>104.1</td> <td>104.62</td> <td>104</td> <td>103.3</td> <td></td> </tr> </table>	Chainage	10	11	12	13	14	15	NSL	105	105.6	105.44	105.9	105.42	104.3	Chainage	16	17	18	18	20		NSL	105	104.1	104.62	104	103.3		20
Chainage	10	11	12	13	14	15																								
NSL	105	105.6	105.44	105.9	105.42	104.3																								
Chainage	16	17	18	18	20																									
NSL	105	104.1	104.62	104	103.3																									
3 (a)	Explain Plinth Area Method and Cubic Rate Method for preparing Preliminary Estimate and give with suitability.	5 x 2																												
(b)	A hall is of size 30 x 25 m. The room is to be provided with cement concrete flooring 40 mm thick in 1:4:8 proportions. Calculate the quantity of materials required.	10																												
4	The Reinforcement details of a RCC Slab is given in Figure – 2. Calculate the quantity of materials required and prepare the Bar Bending Schedule for the Slab.	20																												
5(a)	Explain the following:- i. Tender Document. ii. Security Deposit. iii. Qualities of a good contractor.	4,3,3																												
(b)	Define contract. Explain briefly the different types of contract & give their suitability?	10																												
6(a)	Distinguish between: i. Sinking fund & depreciation. ii. Salvage value & Scrap value. iii. Capitalized value & Year's purchase	3X3=09																												
(b)	An old building has been purchased by a person at the cost of Rs 1,50,000/- excluding the cost of land. Calculate the amount of annual sinking fund & installment of sinking if the future life of the building is 35 years & rate of compound interest is 15%. Assume scrap value as 10% of the cost of the purchased.	11																												
7(a)	A room of size 6 X 8.5 m is provided with a RCC Slab 160 mm thick with percentage of reinforcement as 1.90 %. Carry out Rate analysis for the slab if 1: 1.5: 3 mix is used.	14																												
(b)	Define Overheads. Explain its various types.	06																												

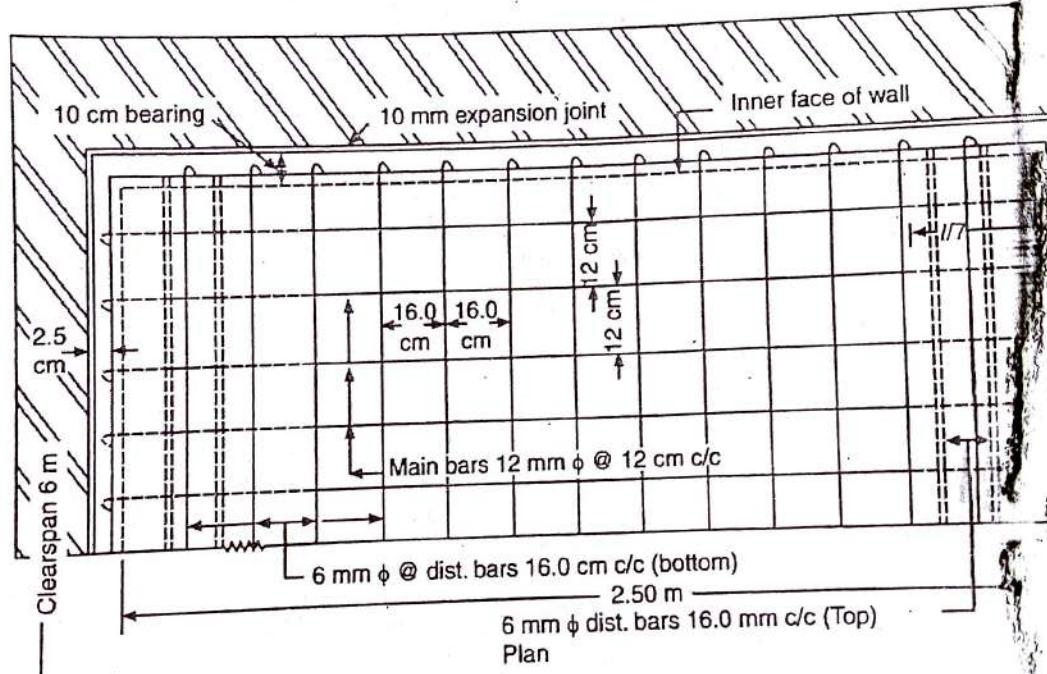
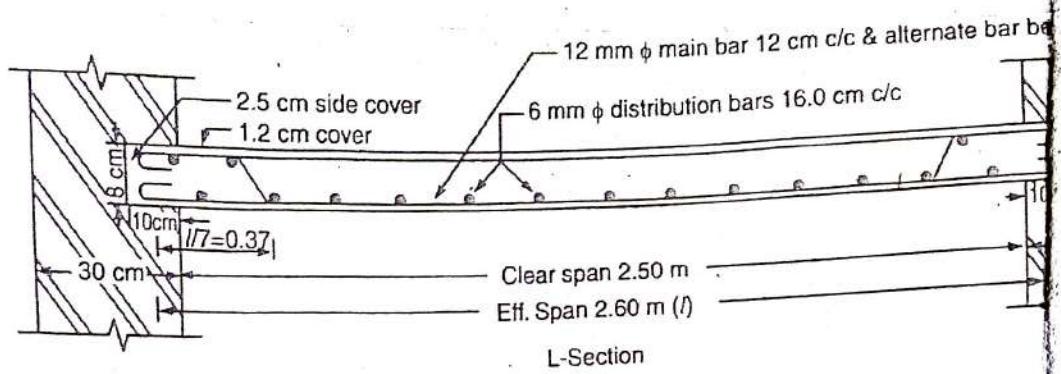
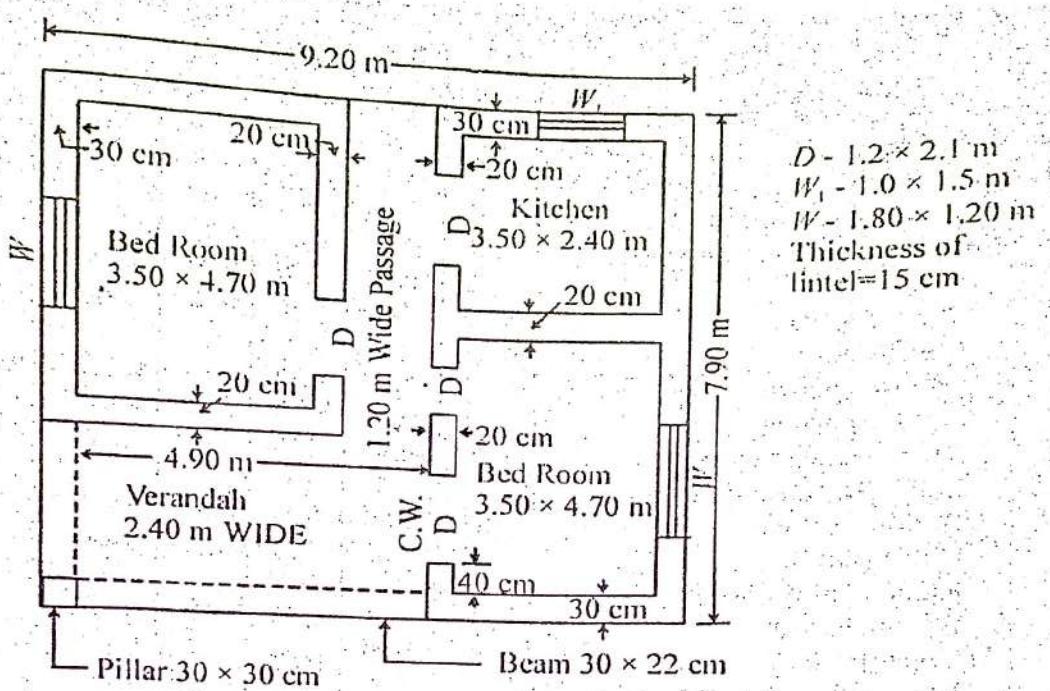


FIGURE – 2 (Q. No: - 4)



15 em R.C.C. Slab Roofing with
Two Coats of Hot Bitumen and
10 em Mud and Mud Plaster

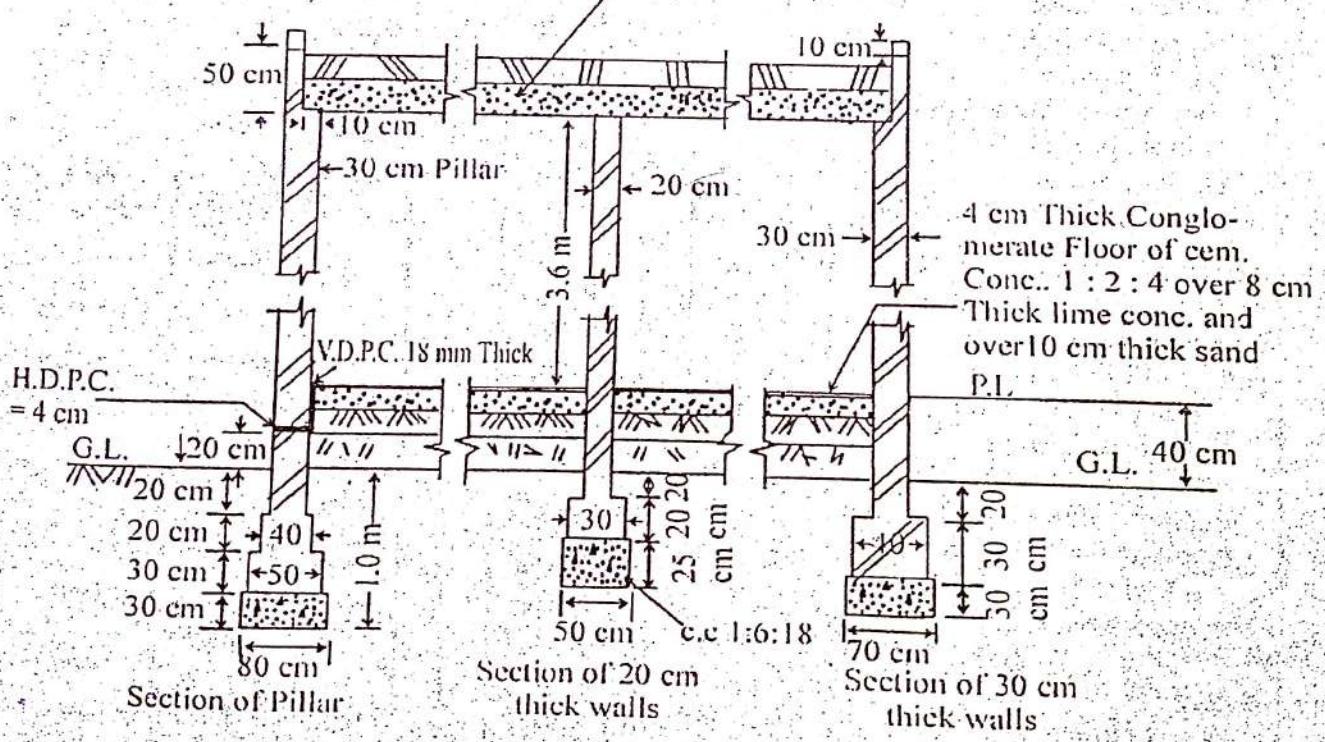


FIGURE – 1 (Q. No: - 1)

CLASS: - SIXTH SEMESTER – CIVIL ENGINEERING (NEW SCHEME)
SUBJECT: EARTHQUAKE RESISTANT BUILDING CONSTRUCTION.

Time Allowed: - 3 hours

Max. Marks: - 100

Instructions for Candidate:-

1. Attempt any Five Questions

Q. No	QUESTION	MARKS
1 (a)	Explain Primary Waves and Secondary Waves.	10
(b)	Explain Structural Modeling as per IS 1893 - 2002	10
2 (a)	Explain the following terms with respect to a Seismograph:- i. Sensor ii. Recorder iii. Timer	4,3,3
(b)	Explain various types of bands used in walls to tie them together and to impart horizontal and bending strength.	10
3 (a)	Explain Five factors on which the intensity of Earthquake depends upon.	10
(b)	What are the various seismic strengthening arrangements for masonry construction? Explain them.	10
4 (a)	Explain the Classification of Earthquake on basis of Focal Depth and based on their cause.	10
(b)	Explain why Through Stones are provided. Explain with a sketch the guidelines for provision of through stones in stone masonry wall.	10
5 (a)	Explain the causes of Earthquake induced damage of structures.	10
(b)	Explain the general guidelines for construction of walls for earthen houses as per IS 13827 – 1993.	10
6 (a)	Explain the structural behaviour of masonry during an earthquake.	10
(b)	Explain various codal provisions for column - beam joint including reinforcement.	10
7(a)	Explain the following:- i. Diaphragm Failure ii. Failure due to opening in walls	5 X 2
(b)	Explain various provisions for Transverse Reinforcement Stirrups in RCC Beams.	10
8 (a)	Explain the precautions to be taken during designing and construction of Earthquake Resistant Buildings.	10
(b)	Explain Mitigation and Response with respect to Disaster Management.	5 X 2
9 (a)	List various special methods for construction of Earthquake Resistant Buildings and explain any one in detail.	10
(b)	Explain the problem solving process in a Rescue Plan.	10
10 (a)	Explain various provisions for Reinforcement and detailing for beams as per IS 13920 - 1993	10
(b)	Explain the use of following Rescue Equipments:- i. Air Compressor ii. Excavator iii. Hose Pipe iv. Gas Cutter	2.5 x 4

CLASS: - SIXTH SEMESTER – CIVIL ENGINEERING (NEW SCHEME)
SUBJECT: EARTHQUAKE RESISTANT BUILDING CONSTRUCTION.

Max. Marks: - 100

Time Allowed: - 3 hours

Instructions for Candidate:-

1. Attempt any Five Questions

Q. No	QUESTION	MARKS
1 (a)	Explain Primary Waves and Secondary Waves.	10
(b)	Explain Structural Modeling as per IS 1893 - 2002	10
2 (a)	Explain the following terms with respect to a Seismograph:- i. Sensor ii. Recorder iii. Timer	4,3,3
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(b)	What are the various seismic strengthening arrangements for masonry construction? Explain them.	10
4 (a)	Explain the Classification of Earthquake on basis of Focal Depth and based on their cause.	10
(b)	Explain why Through Stones are provided. Explain with a sketch the guidelines for provision of through stones in stone masonry wall.	10
5 (a)	Explain the causes of Earthquake induced damage of structures.	10
(b)	Explain the general guidelines for construction of walls for earthen houses as per IS 13827 – 1993.	10
6 (a)	Explain the structural behaviour of masonry during an earthquake.	10
(b)	Explain various codal provisions for column - beam joint including reinforcement.	10
7(a)	Explain the following:- i. Diaphragm Failure ii. Failure due to opening in walls	5 X 2
(b)	Explain various provisions for Transverse Reinforcement Stirrups in RCC Beams.	10
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(b)	Explain Mitigation and Response with respect to Disaster Management.	5 X 2
9 (a)	List various special methods for construction of Earthquake Resistant Buildings and explain any one in detail.	10
(b)	Explain the problem solving process in a Rescue Plan.	10
10 (a)	Explain various provisions for Reinforcement and detailing for beams as per IS 13920 - 1993	10
(b)	Explain the use of following Rescue Equipments:- i. Air Compressor ii. Excavator iii. Hose Pipe iv. Gas Cutter	2.5 x 4

MJ-13

Class: 6th Semester

Branch: Civil Engineering

Subject: Earthquake Resistant Building Construction

Max Marks: 100

Roll No: 3983.....

Time: 3 Hours

Note: Attempt any FIVE questions. All questions carry equal marks.

Q1. Describe in detail the various causes of earthquakes. (20)

Q2. Briefly describe the following:

(a) Seismograph (b) Seismogram

(c) Epicenter (d) Love waves (20)

Q3. Define out-of-plane failure. What are the main causes. Explain how out-of-plane failure is characterized. (20)

Q4. Write short notes on any two:

(a) Connection failure

(b) Non-structural component failure

(c) In-plane failure (20)

Q5. How retrofitting of masonry building is done. Explain at least five methods. (20)

Q6. (a) Why seismic codes are useful.

(b) Describe the role of vertical reinforcement in retrofitting the structure. (08, i2)

Q7. Describe the role of and function of Infill walls and the damages they experience during earthquake. (20)

Q8. List the various Indian Seismic codes and write a detailed description on any one code. (20)

Q9. Write short notes on any two:

(a) Effect of Pounding

(b) Function of Substructure

(c) Causality management (10,10)

Q10. (a) Write the importance of debris clearance after the impact of Earthquake.

(b) Define "Disaster Management" and its necessity. (10,10)

MJ-12

Class: 6th Semester

Branch: Civil Engineering

Subject: Earthquake Resistant Building Construction

Max Marks: 100

Roll No: 6/6

Time: 3 Hours

Note: Attempt any five questions. All questions carry equal marks.

Q1. Define seismic wave, Body waves and Surface waves and write the important characteristics of P waves and L waves. (20)

Q2. Describe the classification of Earthquakes on the basis of location, cause, focal depth and intensity. (20)

Q3. Describe in detail the seismic performance of masonry building enlisting various factors contributing towards their low seismic efficiency. (20)

Q4. Explain different types of seismic bands used in retrofitting the structures as per IS Code 4326 (1993). (20)

Q5. Write the recommendations of Brick masonry construction as per IS 4326. (20)

Q6. Describe the role of IS 13920-1993 in making the building earthquake resistant. (20)

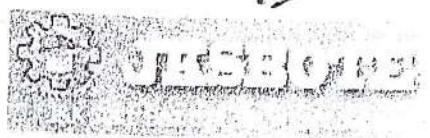
Q7. Write short notes on any two
 a. Safety in rescue operations
 b. Rescue equipment
 c. Importance of Disaster management (2x10=20)

Q8. Write the name of various cities under various i.e. Four seismic zone as per revised BIS code 1893 (Part-I) 2002. (2x10=20)

Q9. Write short notes on any two
 a. SEISMOGRAPH
 b. SEISMOGRAM
 c. RESTORATION OF STRUCTURES (2x10=20)

Q10. Write short notes on any two
 a. Out-of PLANE FAILURE
 b. Connection Failure
 c. Necessity of providing Vertical Reinforcement. (2x10=20)

Branch: Civil, Civil(PHE), QSCM Sub: ERSC
 Time: 3 hrs. Max Marks: 100 Scheme: New Sem: 6
 Instructions: 1) Attempt any 5 questions.
 2) Use only blue pen.



Q1: Define seismic waves. What are the different types of seismic waves?

Explain the important characteristics of p waves and S waves. (20)

Q2: What is seismogram. Explain its applications. State any one method of locating epicenter of an earthquake. (20)

Q3 a: Enumerate the various failure mechanism of a masonry building. (10)

b: Define out - of-plane failure. What are its main causes and how its failure is characterized? (10)

Q4: Explain connection failure in a masonry building with neat sketches. How can we prevent it?

What are the various types of non-structural component failure? (20)

Q5 a: Explain the technical reasons for providing vertical reinforcement in masonry walls. Also list the points to be considered while providing them. (10)

b: Explain the following terms: 1. Dowel bars. 2. Through stones. 3. Diagonal bracing

4. Deformability (10)

Q6 a: Which system is more used in planning of earthquake resistant buildings. (5)

b: Explain the use of through stone with the help of a neat sketch. (5)

c: Explain the importance of IS.1893 :: 2002 code in designing earthquake resistant structures. (10)

Q7 a: Explain the guidelines laid down by IS 13920-1993 for the following (a) columns (b) shear walls (c) Joints in framed construction (20)

Q8 a: What is a floating column? How does their presence affect the seismic performance of a building? (20)

Q9 a: Explain the "shotcrete" method of retrofitting for traditionally built constructions. (10)

b: Explain with the help of a diagram, various codal provisions for lateral ties of a column (10)

Q10: What is "rescue plan"? What are the processes required obtaining an efficient rescue plan? (20)

9 (a)	Draw (i) Pictorial (ii) perspective	Explain	Explain	What are under the
10(a)	(b)			(b)

SIXTH SEMESTER – CIVIL ENGINEERING (NEW SCHEME)
SUBJECT: - STRUCTURAL DRAWING.

Max. Marks: - 100

Instructions for candidate:-

Time Allowed: - 3 hours

1. Attempt **FOUR** questions with **TWO** Questions from each Section.
2. Assume suitable data wherever necessary.

Q. No	Section A	MARKS
1	<p>Draw the plan and cross section of a restrained two way slab from the following data</p> <p>Size of room = 8m x 4.5m</p> <p>Thickness of walls = 300mm</p> <p>Thickness of slab = 180mm</p> <p>Bearing on walls = 150mm</p> <p>Reinforcement along shorter span = 10mm dia @120mm c/c</p> <p>Reinforcement along longer span = 10mm dia @150mm c/c</p> <p>Torsion reinforcement at all four corners in the form of mesh of 10mm dia @ 100mm c/c both ways</p>	25
2	<p>Draw to a suitable scale the cross-sections (one near support and other near the free end) along with L-section of a cantilever beam with the following data</p> <p>Span projecting beyond support = 3m</p> <p>Size of beam (at free end) = 300mm x 200mm</p> <p>Size of beam (at fixed end) = 300mmx 600mm</p> <p>Main reinforcement = 4-20mm dia (out of which two bars are curtailed at 1.80m from fixed end)</p> <p>Wall thickness and bearing = 400mm</p> <p>Shear stirrups = 8mm dia 2 legged @ 300mm c/c</p> <p>Anchor Bars = 2-12mm dia</p>	25
3	<p>Use HYSD steel reinforcement .Assume any other missing data.</p> <p>Draw to a suitable scale cross section of a head connection of two beams on both sides of a column as per the data given below: (R/F bars are HYSD)</p> <p><u>Column:</u></p> <p>Size = 450 X 450 mm</p> <p>Main bars = 8 – 16 mm ϕ bars</p> <p>Lateral ties = 8 mm ϕ @ 250 mm c/c (Double ties)</p> <p><u>Beams:</u></p> <p>Size = 300 X 450 mm (including 100 mm thick slab)</p> <p>Main bars = 5 – 16 mm ϕ (two bars bent up at L/7 from center of column)</p> <p>Stirrups = 8 mm ϕ 2 legged stirrups @ 250 mm c/c</p> <p>Anchor bars = 2 – 12 mm ϕ</p>	25
4	<p>Draw to a suitable scale, sectional plan and elevation of a Circular column with isolated footing of uniform thickness from the following data;</p> <p><u>Column Details</u></p> <p>Diameter of column = 550 mm</p> <p>Reinforcement longitudinal bar = 6 – 20 mm dia</p> <p>Transverse Ties = 8 mm dia @ 300 mm c/c</p> <p>Height of column above plinth level = 3.8 m.</p> <p>Depth below Ground level = 1.0 m.</p> <p>Plinth level above ground level= 40 cm</p>	25

9 (a)	Draw a neat sketch of the connections showing various details and parts between: (i) Purlins and the roofing material (ii) principal rafter and the purlins	6 x
(b)	Explain briefly the different types of column bases.	08
10(a)	Explain briefly the design of masonry wall foundation.	08
(b)	What are laterally supported beams? What is the necessity of providing bearing plates under the beams?	12

SIXTH SEMESTER - CIVIL ENGINEERING (NEW SCHEME)

861601301

ROLL NO:.....

SUBJECT: - STRUCTURAL DRAWING.

Time Allowed: - 3 hours

Max. Marks: - 100

Instructions for candidate:-

1. Attempt FOUR questions with TWO Questions from each Section.
2. Assume suitable data wherever necessary.
3. USE BLUE PEN ONLY.

SECTION A

Q 1	<p>Draw to a suitable scale Sectional Plan and Sectional Elevation of a RCC Column - Beam junction in a Portal Frame as per the data given below:</p> <p><u>Column:</u></p> <p>Size = 700 X 500 mm</p> <p>Main bars = 4 - 20 mm ϕ + 4 - 25 mm ϕ</p> <p>Lateral ties = 8 mm ϕ @ 220 mm c/c</p> <p><u>Beams:</u></p> <p>Size = 280 X 500 mm (including 120 mm thick slab)</p> <p>Main bars = 8 - 12 mm ϕ with three bars bent up at L/7 from centre of column</p> <p>Stirrups = 8 mm ϕ 2 legged stirrups @ 200 mm c/c</p> <p>Anchor bars = 2 - 10 mm ϕ</p>	12, 13
Q 2	<p>Draw the plan and cross section of a Two Way Slab from the following data. The Slab is free to lift at all corners.</p> <p>Size of room = 7.5 m x 5.0m</p> <p>Thickness of walls = 230 mm</p> <p>Thickness of slab = 125 mm</p> <p>Bearing on walls = 180mm</p> <p><u>Middle Strip Reinforcement</u></p> <p>Along shorter span = 12 mm dia @ 150mm c/c</p> <p>Along longer span = 10mm dia @ 200mm c/c</p> <p><u>Edge Strip Reinforcement</u></p> <p>Both Ways Reinforcement = 8 mm dia @ 220mm c/c</p> <p>Clear Cover = 20 mm</p>	13, 12
Q 3	<p>Draw to a suitable scale Longitudinal Section and two Cross Sections (one near support and other near the free end) of a cantilever beam with the following data:-</p> <p>Span projecting beyond support = 3.25 m</p> <p>Size of beam (at free end) = 250mm x 250 mm</p> <p>Size of beam (at fixed end) = 250mmx 450 mm</p> <p>Main reinforcement = 6-12mm dia (out of which two bars are curtailed at 1.75m from fixed end)</p> <p>Wall thickness and bearing = 300mm</p> <p>Shear stirrups = 8mm dia 2 legged @ 210mm c/c</p> <p>Anchor Bars = 2-10mm dia</p> <p>Use HYSD steel reinforcement</p>	06, 06, 13
Q 4	<p>Draw to a suitable scale ,the sectional plan and elevation of a Circular column with isolated footing from the following data;</p> <p><u>Column Details</u></p> <p>Diameter = 700 mm</p> <p>Reinforcement longitudinal bar = 8 - 25 mm dia</p> <p>Transverse Ties = 10 mm dia @ 250 mm c/c (Double ties)</p> <p>Height of column = 3.6 m</p> <p><u>Footing Details</u></p> <p>Size of footing = 3.0 m x 3.0 m</p> <p>Thickness of footing at column face = 800 mm</p> <p>Thickness of footing at free end = 300 mm</p>	12,13

enforcement = 32 mm dia @ 230 mm c/c both ways
Depth below G.L = 1.5m

SECTION B

- Q5. Draw the front view of Heel Joint of a roof truss showing all details from the data given below:-
Principal rafters = 2 - ISA 90 x 60 x 12 mm inclined at 30° to horizontal
Tie Member = 2 ISA 75 x 50 x 8 mm
Cleats = ISA 100 x 75 x 6 mm
Purlins = ISA 50x50x5 mm
Gusset plate = 10 mm thick
Shoe Angle = 2 ISA 80 x 80 x 8 mm
Base Plate = 12 mm thick
Bearing Plate = 16 mm thick
Anchor Bolt = 20 mm diameter - 2 No
Support Thickness = 300 mm
Rivets = 18 mm diameter PDF.

- Q6. Draw the top view and front view of a column with its base from the following data:
Column = ISHB 300 @ 618 N/m

13, 12

Flange Plates - One Plate 12 mm thick over entire flange width on each flange.

Gusset Plate = 16 mm thick

Base plate = 800 mm x 650 mm x 25 mm

Web cleats = ISA 100 x 100 x 12 mm

Flange cleats = ISA 100 x 100 x 12 mm and 300 mm long

Bolts = 20 diameter, 175 long

Foundation size = 3 m x 2.5 m x 0.8 m

Anchor plate = 75 mm x 75 mm x 10 mm

- Q7. Two beams are resting on the top of a steel column. Draw to suitable scale front and side elevation of the connection from the following data:-

13, 12

Column = ISHB 300 @ 576.8 N/m

Beams = ISHB 200 @ 392.4 N/m

Cover Plate = 350 x 150 x 10 mm

Bearing Plate = 500 x 250 x 12 mm

Cleat Angles = ISA 150 x 75 x 10

Clearance = 10 mm

Rivets = 20 mm dia Hand Driven Rivets

- Q8. Draw the elevation, sectional plan of a plate girder from the following data:

13, 12

Clear span of plate girder = 10 m

Web plate = 1200mm x 10mm

Flange angles = 2-ISA 150 x 115 x 8mm

Bearing plate = 300x400x12mm

Thickness of filler plate = 10 mm

End bearing stiffeners = ISA 150x115x8mm

Vertical stiffeners = ISA 100x75x8mm@ 1000mm c/c

Horizontal Stiffener = ISA 80 x 80 x 8 mm

Flange plates = 400x12-mm

Increment
-pth below

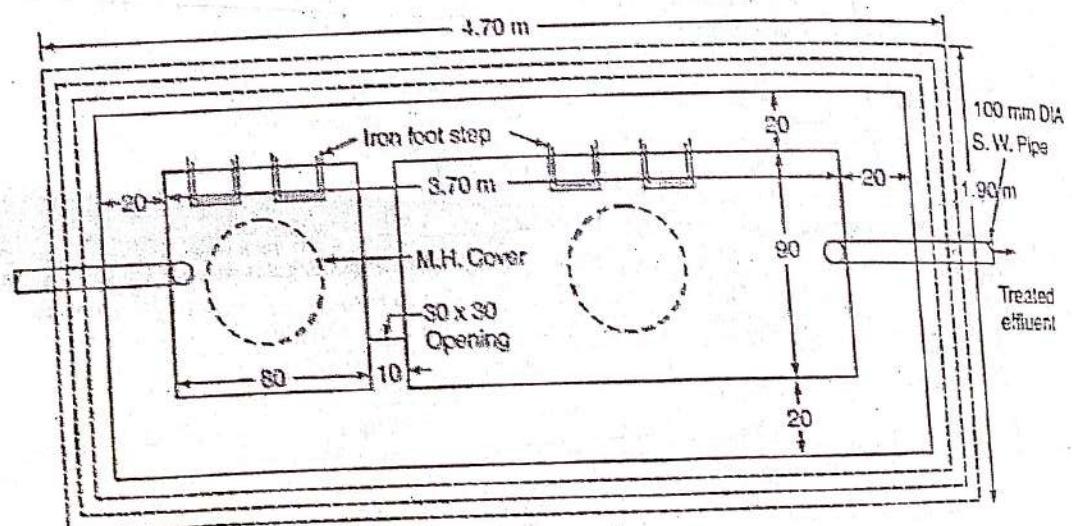
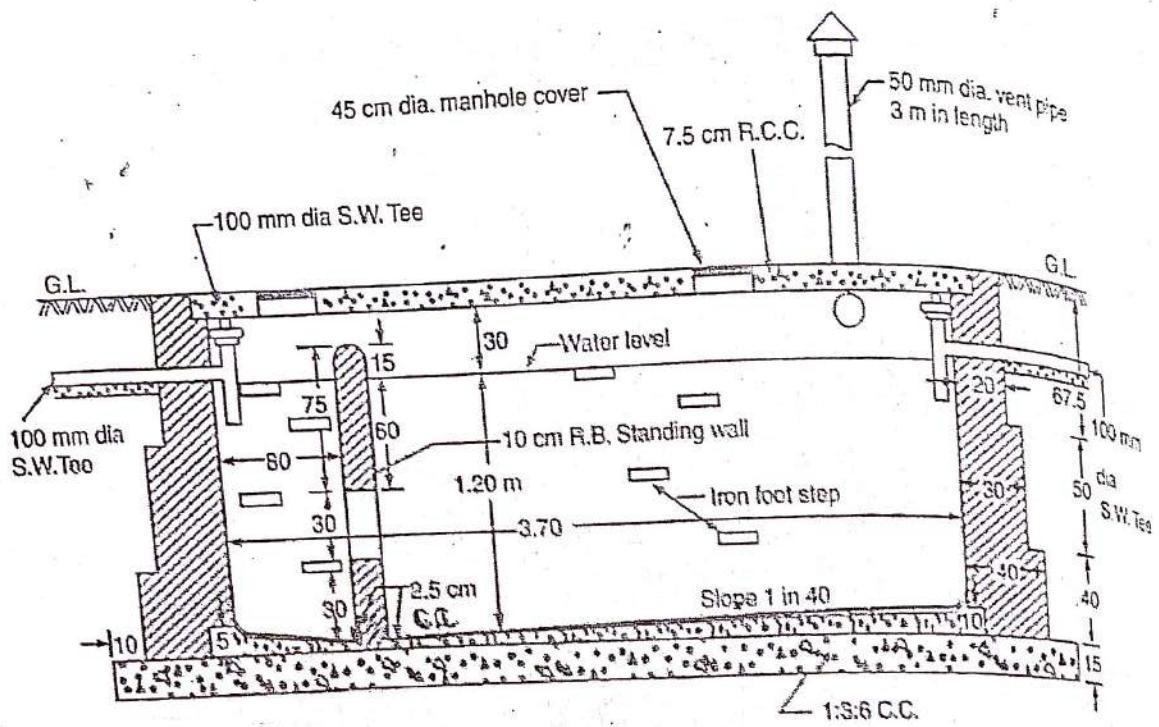


FIGURE - 02 (Q. No: - 06)

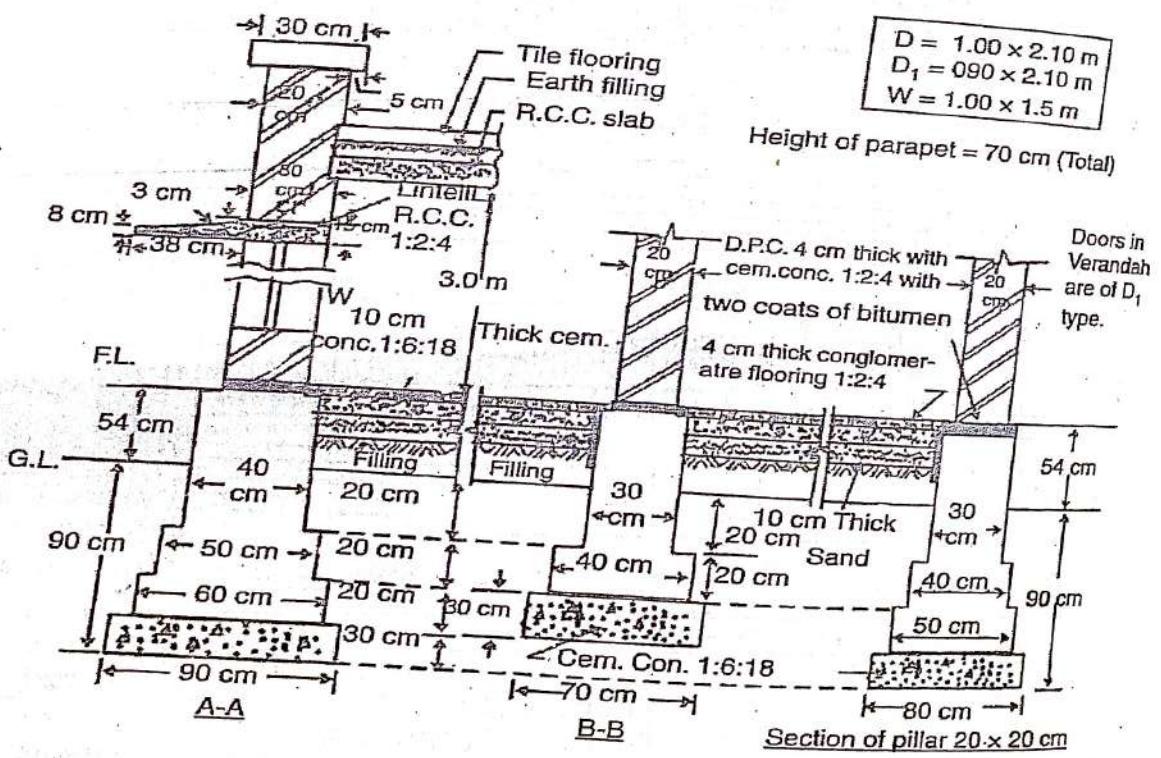
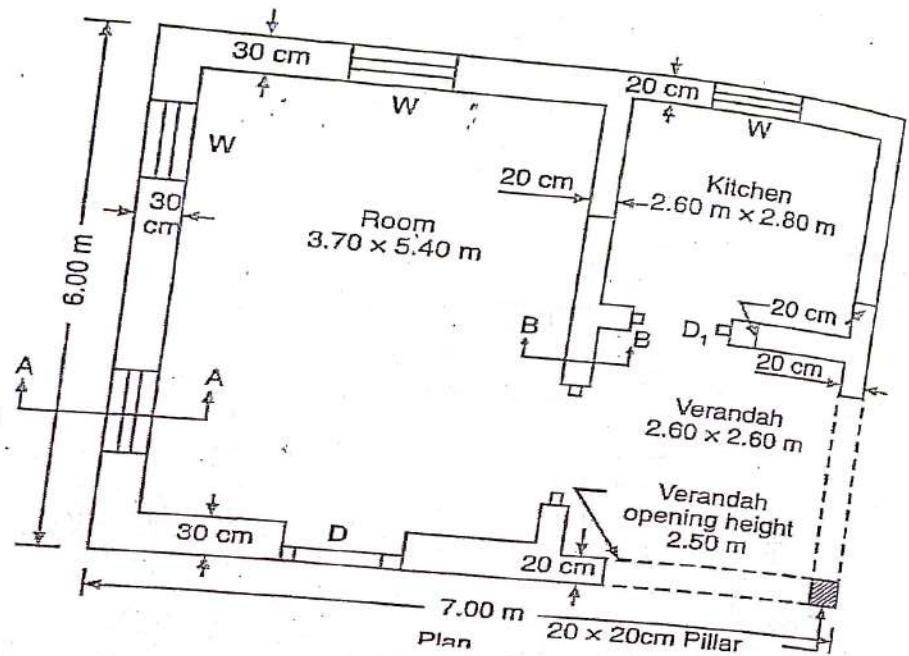


FIGURE - 01 (Q. No: - 01)

Roll No:

Part C (6x)

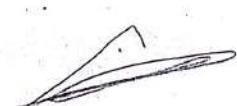
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Branch: Civil Sub: Structural Drawing

Time: 4 hrs. Max Marks: 100 Scheme: New Sem: 6.

Instructions: 1) Attempt any 4 questions, 2 from each section

2) Use only blue pen.

Q. No	Section A*	MARKS
1	<p>Draw to a suitable scale the L-section & two cross sections (one at mid span & other near the support) of a Doubly RCC beam from the following data: Also prepare bar bending schedule. (R/F bars are HYSD)</p> <p>Size of beam = 350 mm X 500 mm Clear span = 5.6 m Bearing on wall = 40 cm \approx 400 mm Tensile reinforcement = 5 - 22 mm ϕ bars (two bar bent up at L/7 from center of support) Compression reinforcement = 3 - 16 mm ϕ bars Shear stirrups = 8 mm ϕ center 2 legged @ 200 mm c/c upto 1 m from support & @ 240 mm c/c for remaining central length.</p> 	25
2	<p>Draw the plan and cross section of a restrained two way slab from the following data</p> <p>Size of room = 6 m x 4.5 m Thickness of walls = 300 mm Thickness of slab = 150 mm Bearing on walls = 150 mm Reinforcement along shorter span = 10 mm dia @ 110 mm c/c Reinforcement along longer span = 10 mm dia @ 180 mm c/c Torsion reinforcement at all four corners in the form of mesh of 10 mm dia @ 100 mm c/c both ways</p>	25
3.	<p>Draw to a suitable scale cross section of a head connection of two beams on both sides of a column as per the data given below: (R/F bars are HYSD)</p> <p><u>Column:</u> Size = 450 X 450 mm Main bars = 8 - 16 mm ϕ bars Lateral ties = 8 mm ϕ @ 250 mm c/c (Double ties)</p> <p><u>Beams:</u> Size = 300 X 450 mm (including 100 mm thick slab) Main bars = 5 - 16 mm ϕ (two bars bent up at L/7 from center of column) Stirrups = 8 mm ϕ 2 legged stirrups @ 250 mm c/c Anchor bars = 2 - 12 mm ϕ</p> 	25
4	<p>Draw to a suitable scale, sectional plan and elevation of a rectangular column with isolated footing of uniform thickness from the following data; Also prepare bar bending schedule.</p> <p><u>Column Details:</u> Size of column = 350 mm x 550 mm Reinforcement longitudinal bar = 6 - 25 mm dia Transverse Ties = 8 mm dia @ 300 mm c/c (Double ties) Height of column above plinth level = 3.5 m Depth below Ground level = 1.0 m Plinth level above ground level = 350 mm <u>Footing reinforcement:</u> (R/F bars are HYSD) Size of footing = 3.0 m x 2.5 m Thickness of footing = 500 mm Reinforcement parallel to shorter side = 16 mm dia @ 200 mm c/c Reinforcement parallel to longer side = 12 mm dia @ 200 mm c/c</p> 	25

5

Section B

Draw to a suitable scale front & side elevation of a column and two beams sealed connection for the following data when two beams are connected to both the flanges of the column:

25

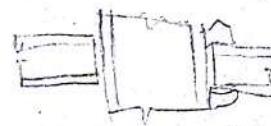
Column = iSHB 300 @ 576.8 N/m

Beam = 2 - ISMB 225 @ 305.1 N/m

Seat angles = 2 - ISA 100 X 75 X 8 mm

Top Cleat angle = 2 - ISA 90 X 90 X 10 mm

Diameter of rivets = 20 mm



6

Draw front elevation & sectional plan of a plate girder from the following data:

25

Clear span of plate girder = 8 m

Web plate = 1000 X 8 mm

Flange angles = 2 - ISA 150 X 115 X 8 mm

Bearing Plate = 300 X 400 X 12 mm

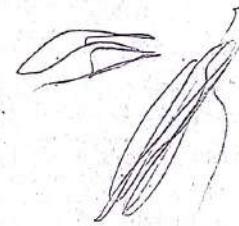
Size of concrete block = 300 X 400 X 200 mm

End bearing stiffeners = ISA 150 X 115 X 8 mm

Intermediate stiffeners = ISA 100 X 75 X 8 mm; @ 1000 mm c/c

Flange plates (Cover plates) = 400 X 10 mm; one at top & one at bottom

Thickness of filler plate = 8 mm



7

Draw the plan, front & side elevation of gusseted base stanchion from the following data:

25

Stanchion = iSHB 350 @ 661.2 N/m

Gusset Plate = 15 mm thick

Base Plate = 800 mm X 600 mm X 20 mm

Web Cleat angles = 2 - ISA 150 X 115 X 8 mm

Flange Cleat angles = 2 - ISA 150 X 115 X 8 mm

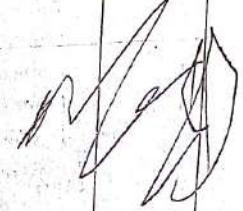
Holding down bolts = 18 mm dia, 180 mm long - 4 Rag bolts

Diameter of rivets = 20 mm

RCC base slab = 900 X 700 X 400 mm

Reinforcement in base slab = 12 mm dia @ 150 mm c/c both ways

6 7 ≈ 7



8

Draw the front view of a ridge joint of a roof truss showing all detail including gusset plate, ridge sheet, A.C. roof covering, rivets and cleats etc. as follows:

25

Principal rafters = 2 - ISA 55 x 55 x 6 mm inclined at 30° to horizontal

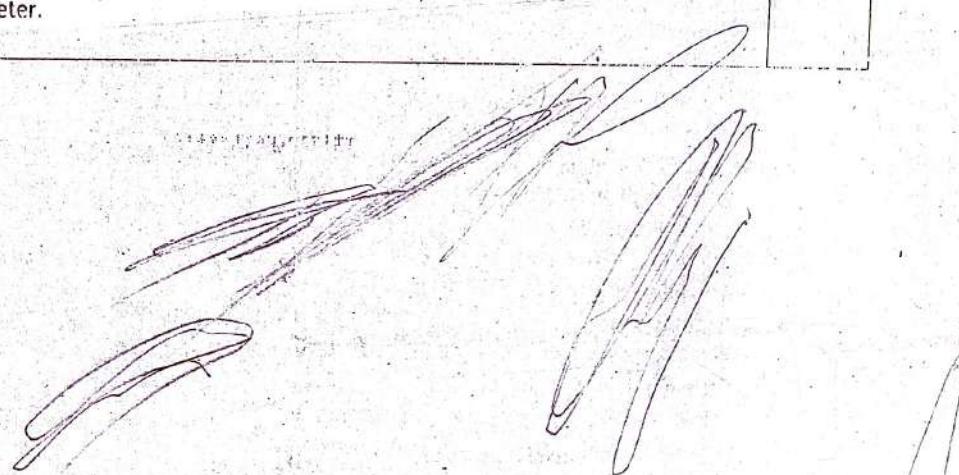
Inclined ties (upper ties) meeting at ridge = 1 - ISA 55 x 55 x 6 mm at 60° to horizontal

Cleats = ISA 100 x 75 x 6 mm

Purlins = 50x50x5 mm

Gusset plate = 6 mm thick

Rivets = 20 mm diameter.



CLASS: - SIXTH SEMESTER – CIVIL ENGINEERING (NEW SCHEME)
SUBJECT: - CONSTRUCTION MANAGEMENT & ACCOUNTS

Max. Marks: - 100

Time Allowed: - 3 hours

Instructions for candidate:-

1. Attempt any five questions.

Q. No	QUESTION	MARKS
1	<p>The network of a certain project is shown in the figure below with the estimated duration of each activity. Determine:-</p> <ol style="list-style-type: none"> i. Earliest and Latest Event Time. ii. Earliest and Latest Start and finish Time of each activity. iii. Total and Free Float for each activity. iv. Critical Path for Network. <pre> graph LR 1((1)) -- "A, t=5" --> 2((2)) 1 -- "B, t=3" --> 4((4)) 1 -- "C, t=8" --> 3((3)) 2 -- "G, t=4" --> 5((5)) 2 -- "F, t=6" --> 6((6)) 2 -- "E, t=7" --> 7((7)) 4 -- "D, t=4" --> 3 4 -- "F, t=6" --> 6 4 -- "J, t=2" --> 8((8)) 5 -- "I, t=1" --> 6 5 -- "H, t=1" --> 7 6 -- "K, t=1" --> 8 7 -- "L, t=6" --> 8 </pre>	20
2 (a)	Explain the role of an engineer in the construction economy of a project.	10
(b)	Explain Reappropriation of Funds Bill.	10
3 (a)	What are the different members of a construction team? What are the functions of each member? What are the advantages of good relationship between them?	10
(b)	Explain Acquittance Roll and Muster Roll.	10
4 (a)	Explain the Material Schedule with an example.	10
(b)	Name the various types of Organizations. Explain them briefly.	10
5 (a)	Explain the factors which affect the job layout and placement of construction equipment at site.	10
(b)	Explain the causes of poor condition of labours in India.	10
6 (a)	Explain the following:- i. Wage Period ii. Deduction of wages iii. Partial Disablement	3,3,4
(b)	Explain various stages of Inspection and Quality Control for Brick Masonry work.	10
7 (a)	What do you understand by control of progress and what are the methods of recording progress of work.	10
(b)	Explain the various physical causes of accidents at site.	10
8 (a)	Explain the various safety measures that need to be taken at site during excavation by an excavator.	10
(b)	Explain the following:- i. Cost Time Optimization ii. Analysis of Progress	5 x 2
9 (a)	Explain the following:- i. Preparation of Bill of Quantities ii. Account of Stock	5 x 2
(b)	Explain the various precautions that need to be taken for maintaining a Cash Book.	10
10(a)	Explain the following:- i. Temporary Advance ii. Remittance and Remittance Head	5 x 2
(b)	Distinguish between PERT and CPM. Which one is more advantageous and why?	10

ROLL NO. :

861701159

SIXTH SEMESTER - CIVIL ENGINEERING (NEW SCHEME)
SUBJECT: - CONSTRUCTION MANAGEMENT & ACCOUNTS

Max. Marks: - 100

Time Allowed: - 3 hours

Instructions for candidate:-

1. Attempt any five questions.
2. All questions carry equal marks.
3. Support your answers with neat sketches wherever required. USE BLUE PEN ONLY.

Q. No	QUESTION	MARKS
1 (a)	Define the following terms with reference to construction management: Planning, Organizing, Directing, Coordinating and communicating	2X5
(b)	Who are the different members of construction management? Write the advantages of good relations between them.	10
2 (a)	What is the importance of construction planning? Discuss Contract planning in detail.	10
(b)	Define 'Organization' and why is it necessary? In what ways functional organization differ from other types?	10
3 (a)	Explain Line type organization. Write its advantages and disadvantages.	10
(b)	What are the principles of storing and stacking materials at site? What points will you consider for locating equipments at the site of work?	10
4	A network is given in fig 1, with the expected time of completion of each activity. Determine the earliest expected time and latest occurrence time for each event. Also determine the critical path.	20
5 (a)	Write a detailed note on the conditions of Construction workers in India. What do you mean by Nominal wages and Real wages?	10
(b)	Discuss the important provisions of Minimum Wages Act.	10
6 (a)	What do you mean by Cost Optimization? Discuss direct and indirect cost in detail.	10
(b)	What are the stages of Inspection of construction works? State the ways in which quality control can be maintained in respect of RCC works.	10
7 (a)	List the major items in a construction job requiring quality control. Explain any two in detail.	10
(b)	Describe safety measures adopted during: <ol style="list-style-type: none"> (i) Handling and storage of explosives (ii) Transportation of explosives 	5X2
8 (a)	List the causes of accidents. What safety measures are observed in the erection and use of scaffoldings?	10
(b)	Differentiate between PERT and CPM.	05
(c)	What is technical sanction?	05
9 (a)	Why are contractors required to deposit Earnest money along with their tenders?	05
(b)	Differentiate between standard M Book and Check M book.	05
(c)	Define cash book. Detail out the instructions which should be observed while writing the main cash book in PWD sub Division.	10
10(a)	Give the broad classification of stores. Outline accounts procedure adopted in each case.	10
(b)	Write short note on the following: <ol style="list-style-type: none"> i) Preparation of Bill of Quantities(BOQ) ii) Expenditure and revenue head 	5X2

M.J.-14

Class: 6th Semester
Branch: Civil Engineering
Subject: Construction Management
Max Marks: 100

Roll No: ...15.13...

Time: 3 Hours

Note: Attempt any FIVE questions. All questions carry equal marks.

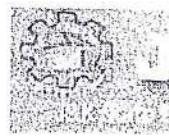
- Q1. (a) Enlist the main objectives of construction management.
(b) What is difference between PERT and CPM Networks. (10,10)
- Q2. Explain the meaning and significance of the following principles of organization:
(a) Span control
(b) Delegation of Authority
(c) Ultimate Responsibility
(d) Unity of Command. (20)
- Q3. Draw a typical job layout plan for a residential building of size 18m x 36m to be constructed at a place. The available space for camp site is 55m x 73m. (20)
- Q4. (a) Write a short note on "Minimum Wages Act, 1948" passed by Government of India for promoting labour welfare in India.
(b) What are functions of a trade union. (2,20)
- Q5. (a) What is difference between direct and indirect costs as related to construction projects.
(b) What are the main corrective actions to be taken by the site engineer keeping his head office informed for controlling progress. (6,12)
- Q6. (a) What is the need for inspection and quality control in building construction.
(b) What are the main points to be kept in mind for quality control of sanitary and water supply services. (10,10)
- Q7. (a) Define the term accident. Give four examples of accidents in construction industry.
(b) What are the important points to be kept in mind for the safety of construction workers engaged for hot bituminous works. (10,10)
- Q8. (a) Explain the functions of an Engineer in a construction team.
(b) What are the basic functions of tractor in construction industry. (10,10)
- Q9. Explain the following terms:
(a) Technical Sanction
(b) Administrative Approval
(c) Mustor Roll
(d) Contractor Ledger. (10,10)
- Q10. (a) What is the difference between Imprest and Temporary advance.
(b) Define scheduling in construction planning. What are its advantages. (10,10)

Branch: Civil/Civil(PHE) QSCM Sub: Construction Management & Accounts

Time: 3 hrs. Max Marks: 100 Scheme: NEW Sem: 6

Instructions: 1) Attempt any 5 questions.

2) Use only blue pen.



- bus
1st 2nd 3rd 4th 5th 6th 7th 8th 9th 10th
Team spirit*
- Q1 a: Explain in detail the functions of construction Management. *Posters, advertisements, contracts, price action* (10)
 b: Discuss the classification of construction industry Give example of each type. *Civil, Civil Engg* (10)
- Q2 a: What is cpm? What are the limitation and advantages of scheduling by cpm? (10)
 b: Explain pre-tendering and contract planning. Write down the advantage of planning. (10)
- Q3 a: Write down the different characteristics of an organisation. (10)
 b: Explain line type organization. Write its advantages and disadvantages; (10)
- Q4 a: Pen down the main points to be kept in mind while organising labour at site. (10)
 b: Pen down the points which you will consider for locating equipment's at the site of work. (10)
- Q5 a: Explain wages. Write about 'nominal and real wages', also list the types of labour. *Wages* (10)
 b: What do you understand by labour welfare? What are the various systems of wage payments? (10)
- Q6 a: Explain deeply progress analysis. (10)
 b: i) Explain purposes of progress recording. ii) Differentiate between the term "production" and "productivity". (10)
- f/k* Q7 a: i) Write down the need of inspection and quality control of construction work. ii) What are the objectives of quality control of works? (10)
 b: What are the stages of inspection of construction works? State the ways in which quality control can be maintained in respect of rcc works. (10)
- Jas* Q8 a: Describe safety measures adopted during. i) Handling and storage of explosives. (10)
 ii) Transportation of explosives. (10)
 b: Describe safety measures required for working of excavating machinery. (10)
- Q9 a: Write short note on administrative approval (5)
 b: Differentiate between standard m book and check m book. (5)
 c: Why are contractors required to deposit earnest money along with their tenders? (5)
 d: What are the possible serious irregularities in the maintenance of m book? (5)
- Q10 a: What are storage charges? Write the irregularities of common occurrences in stock accounts. (10)
 b: Define cash and also write down the precautions in custody of cash book. (10)

SIXTH SEMESTER – CIVIL ENGINEERING (NEW SCHEME)
SUBJECT: - REPAIR & MAINTENANCE OF BUILDINGS

Max. Marks: - 100

Time Allowed: - 3 hours

Instructions for candidate:-

1. Attempt any five questions.
2. All questions carry equal marks.
3. Support your answers with neat sketches wherever required

Q. No	QUESTION	MARKS
1 (a)	List and explain the objectives of maintenance of buildings.	10
(b)	Explain the effect of various agencies of deterioration on concrete & explain how it can be minimized.	10
2 (a)	Explain the various factors which influence the decision to carry out the maintenance of buildings.	10
(b)	List the various methods for determination of strength of concrete in existing RCC elements and explain any one method in detail.	10
3 (a)	Explain the effect of various deterioration agencies acting on the R.C.C roof of a building located in a coastal region with moderate climate.	10
(b)	Describe the most probable causes for dampness in walls. Suggest the remedial measures to prevent it.	10
4 (a)	Explain the various causes for defects in Building foundation and Wall plaster of a building? Also explain the remedial measures to prevent it.	6 X 2
(b)	Explain how does the faulty drainage contribute to the process of deterioration?	08
5 (a)	Explain the technique best suited to control the repeated dampness of the footing in an area with high water table.	10
(b)	Describe the importance of physical measurement for defect diagnosis. Draw the flow chart of systematic approach to defect diagnosis.	10
6 (a)	Enlist different types of joints in buildings. Explain the preparation of joints for repair.	10
(b)	Differentiate between Adding reinforcement and stitching dogs.	10
7 (a)	What is Ferro cement? How can it be used for water proofing of flat roofs in wet areas?	10
(b)	Explain briefly the Cathodic protection to control corrosion in reinforced cement concrete elements.	10
8 (a)	Explain Pneumatic technique suited for material placement with the help of neat sketches.	10
(b)	Describe briefly the important properties of Epoxy resins and Shotcrete.	5 X 2
9 (a)	What are the different techniques for repairing surface voids in concrete? Explain any one in detail.	10
(b)	Explain the method of removal of efflorescence in masonry walls.	10
10	Explain the following with the help of neat sketches: (i) Honey Comb. (ii) Repairing of underground water tanks. (iii) Electro Osmosis. (iv) Birds Mouth.	5 X 4

ROLL NO. :

SIXTH SEMESTER – CIVIL ENGINEERING (NEW SCHEME)
SUBJECT: - REPAIR & MAINTENANCE OF BUILDINGS

861701163

Max. Marks: - 100

Instructions for candidate:-

Time Allowed: - 3 hours

1. Attempt any five questions.
2. All questions carry equal marks.
3. Support your answers with neat sketches wherever required. USE BLUE PEN ONLY.

Q. No	QUESTION	MARKS
1 (a)	Explain briefly the significance of repair and maintenance of buildings. Also list down the main objectives of maintenance of buildings.	10
(b)	Explain the effect of various agencies of deterioration on concrete & explain how it can be minimized.	10
2 (a)	Explain the various factors which influence the decision to carry out the maintenance of buildings.	14
(b)	Explain how does the faulty drainage contribute to the process of deterioration	06
3 (a)	Explain the effect of various deterioration agencies acting on the R.C.C roof (size 15 X 20 m) of a building located in a coastal region with moderate climate.	10
(b)	Why NDT is harmless to the buildings? Explain how the corrosion of reinforcement is determined by making use of NDT.	10
4 (a)	Explain the various causes for defects in masonry walls and Paint films of a building? Also explain the remedial measures to prevent it.	7 X 2
(b)	List down the various causes of cracking in concrete elements.	06
5 (a)	Explain the technique best suited to control the repeated dampness of the footing in an area with high water table.	10
(b)	Describe the importance of physical measurement for defect diagnosis. Draw the flow chart of systematic approach to defect diagnosis.	10
6 (a)	Explain briefly the important properties and suitability of Epoxy resin mortar for carrying out repair of mortar/concrete.	10
(b)	Explain the various techniques used for carrying out water proofing of wet areas.	10
7 (a)	Explain curing compounds? List the important characteristics of grouts.	10
(b)	Explain briefly the Cathodic protection to control corrosion in reinforced cement concrete elements.	10
8 (a)	Explain Pneumatic technique suited for material placement with the help of neat sketches.	10
(b)	Explain Epoxy injection method for carrying out repairment of cracks with the help of neat sketches.	10
9 (a)	Explain how honey combing is repaired in a freshly laid R.C.C Column of a public building.	10
(b)	Explain the method of removal of efflorescence in masonry walls.	10
10	Explain the following: (i) Dry Packing Technique. (ii) Repairing of Overhead water tanks. (iii) Electro Osmosis. (iv) Defects in protective finishing.	5 X 4

Class : 6th Semester
 Scheme : New
 Branch : Civil Engineering
 Subject : REPAIR AND MAINTENANCE OF BUILDINGS
 M. Marks : 100

Roll No.

Time : 3 Hours

Note: Attempt any FIVE questions. All questions carry equal marks.

Q1. Define maintenance and explain the factors influencing maintenance. (20)

Q2. Describe the process of deterioration in building elements caused by environmental factors. (20)

Q3. Write brief notes on: (20)

(a) Human factors causing deterioration

(b) Mechanism of deterioration

Q4. (a) Describe in brief systematic procedure of investigation on building defects. (10,10)

(b) List sources of information for building defect investigation.

Q5. Explain in brief any five test (N.D.T) to find the quality of insitu concrete, detection of cracks, honey combing and voids. (10,10)

Q6. Describe in detail the main causes of defects in building elements. (20)

(a) Write the importance of investigation and diagnosis of defects in building. (20)

(b) Describe not more than five most probable causes of defects in (i) Timber (ii) Walls.

Q8. (a) Describe briefly special properties of curing compound. (12,08)

(b) Describe the most important factors which influence the selection of repair materials.

Q9. Describe in detail the importance of preventive maintenance of building for their satisfactory long term service. (10,10)

Q10. Write short note on any two: (20)

(a) Stitching method of crack repair

(b) Efflorescence removal from walls

(c) Dry Packing material placement techniques

(10,10)

SIXTH SEMESTER – CIVIL ENGINEERING (NEW SCHEME)
SUBJECT: - REPAIR & MAINTENANCE OF BUILDINGS

861601306

Max. Marks: - 100

Time Allowed: - 3 hours

Instructions for candidate:-

- 1. ATTEMPT ANY FIVE QUESTIONS.
- 2. SUPPORT YOUR ANSWERS WITH NEAT SKETCHES WHEREVER REQUIRED.
- 3. USE BLUE PEN ONLY.

Q. No	QUESTION	MARKS
1 (a)	Explain various miscellaneous factors causing deterioration in buildings. What is the need to carry out routine maintenance in buildings?	10
(b)	Explain the effect of various agencies of deterioration on paints and explain how it can be minimized.	10
2 (a)	A building has a flat RCC roof of size 15 x 20 m. The building is located in a coastal region with moderate climate. Explain the effect of various deterioration agencies acting on the RCC Roofing.	10
(b)	Explain sequence of detailed steps for diagnosis of dampness in a building.	10
3 (a)	Why NDT is harmless to the buildings? Explain the use of Rebound Hammer in assessment of various parameters in a framed structure.	10
(b)	Describe the most probable causes for defects in masonry walls of a building. Give the remedial measures to prevent it.	10
4 (a)	What are the various defects that occur in Joinery Works of a public building? How can these be repaired?	10
(b)	In an area with high water table the footings of a building are subjected to repeated dampness. Explain the technique best suited to control the issue.	10
5 (a)	Explain the compatibility aspects of various repair materials. Explain Curing Compounds.	10
(b)	Explain how the Honey Combing is repaired in a freshly laid RCC Column of a building.	10
6 (a)	Explain the importance of preventive maintenance in various structural and non structural elements of a building.	10
(b)	List various Crack Repairing Methods and explain any two in detail.	10
7 (a)	Explain the various techniques used for carrying out water proofing of Wet Areas.	10
(b)	Explain the techniques used for controlling the corrosion in Rebars used at construction sites.	10
8 (a)	Explain the causes of defects caused in RCC Columns of a building. How can these be minimized.	10
(b)	A building has developed leakage through mortar joints. Explain how this defect can be rectified.	10
9 (a)	Explain Pneumatic Technique for material placement with a sketch.	10
(b)	Explain the following:- i) Flexible Sealing ii) Form Tie Holes	05 x 2
10	Explain the following: (i) Dry Packing (ii) Techniques for Efflorescence removal (iii) Bonding Aids (iv) Defects in Protective Finishes (v) Repairing of Underground Water Tanks	04 x 5

MJ-14

Class: 6th Semester

Branch: Civil Engineering

Subject: Repair and Maintenance of Buildings

Max Marks: 100

Roll No:

Time: 3 Hours

Note: Attempt any FIVE questions. All questions carry equal marks. Support your answers with neat sketches wherever required.

Q1. (a) Define Maintenance. What is the importance of Repair and Maintenance of Buildings in Civil engineering.

(b) Explain how the various agencies of deterioration affect Stones and explain how these effects can be minimized. (10.10)

Q2. (a) How are Human factors responsible for causing deterioration in buildings. Explain how these can be prevented. (10,10)

(b) Draw a flow diagram of Organizational Structure for maintenance. Give the functions of each of them. (10 x 10)

Q3. (a) What are the various defects that develop in Foundations of buildings and explain their causes. (10,10)

(b) What is the utility of Non Destructive Tests. Explain Rebound Hammer Test in detail.

(Q4) (a) Explain the significance of Maintenance Management. What are its principles.

Q5. (a) What do you mean by Durability. List the factors affecting the durability of repair and construction materials.

(b) Explain with sketch Bird's Mouth method of concrete repairing. (10,10)
 (a) Explain the characteristics and use of Curing Compounds.

Q6. (a) Explain the characteristics and use of Curing Compounds.
 (b) Explain common methods of Surface Protection.

Q7. (a) Enlist the various types of Sealants and explain their characteristics. (10,10)

(b) Mention the various methods for repair of DPC against rising dampness. Explain physical methods in detail. (10,10)

Q8. (a) List the various surface defects in Concrete. Explain how these are repaired.
 (b) What type of deterioration occurs in Timber. Explain in detail. (10,10)

Q9. (a) What are the various defects that occur in Protective Finishes. How can these be repaired.

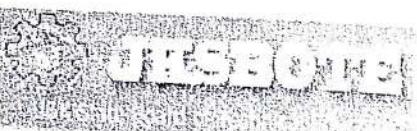
(b) Explain briefly the various types of Maintenance Estimates. (10,10)

Q10. Explain the following (any four): (20)

- (a) Pull Out Test (b) Efflorescence Removal (c) Guniting
 (d) Jacketing (e) Specification of Maintenance Work

86180413

Roll No: 04



Branch: Civil Sub:- Repair and Maintenance of Buildings
 Time: 3 hrs. Max Marks: 100 Scheme: New Sem: 6
 Instructions: 1) Do any 5 questions
 2) Use only blue pen.

- Q1 a: List down the main objectives of maintenance of buildings. Describe briefly planning and design of maintenance system. (10)
- b: Define maintenance of buildings. List the various factors influencing the maintenance of buildings and explain any one in detail. (10)
- Q2 a: Explain the effect of various agencies of deterioration on concrete & explain how it can be minimized. (10)
 b Explain the effect of various agencies of deterioration on timber and timber products. & explain how it can be minimized. (10)
- Q3 a: Give classification of factors causing deterioration and illustrate effect of agencies causing deterioration of timber and concrete with examples? (10)
 b What are the steps involved in the systematic approach of investigation? (10)
- Q4 a: Describe the importance of physical measurement for defect diagnosis. Draw the flow chart of systematic approach to defect diagnosis. (10)
- b: Define investigation and diagnosis of defects. (10)
 c: What are the salient features of non-destructive tests. (5)
- Q5 a: Explain different types of waters causing maintenance problems? (5)
 b: Describe five probable causes for defects in plastics. (10)
- Q6 a: Explain the technique best suited to control the repeated dampness of the footing in an area with high water table. (10)
 b: A building has developed leakage through mortar joints. Explain how this defect can be rectified? (10)
- Q7 a: Explain polyester resin mortar as commercially available repair materials? State its advantages. (10)
 b: distinguish between stressing and jacketing? (10)
- Q8 a: Explain field moulded cold applied sealant technique for sealing of joints. (10)
 b: What is honey combing? How is it prevented? (10)
- Q9 a: Describe briefly the important properties of epoxy resins and shotcrete. (10)
 b: Explain different steps to prepare R. C. C for repair. (10)
- Q10 a: Define efflorescence. What are the remedial measures for efflorescence removal. (10)
 b: Explain briefly electrical method to repair dpc against rising dampness. (10)