



**MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION**

**(Autonomous)**

**(ISO/IEC-270001 – 2005 certified)**

**SUMMER-14 EXAMINATION**

**Subject code: 17309**






**Model Answer**

**Page No: 1/14**








**Important Instructions to examiners:**

- 1) The answer should be examined by keywords and not as word-to-word as given in the model answer scheme.
- 2) The model answer and the answer written by candidate may vary but the examiner may try to assess the understanding level of the candidate.
- 3) The language error such as grammatical, spelling errors should not be given more importance. (Not applicable for subject English and communication skill).
- 4) While assessing figures, examiner may give credit for principal components indicated in the figure. The figure drawn by candidate and model answer may vary. The examiner may give credit for any equivalent figure drawn.
- 5) Credits may be given step wise for numerical problems. In the some cases, the assumed constants values may vary and there may be some difference in the candidates answer and model answer.
- 6) In case of some questions credit may be given by judgment on part of examiner of relevant answer based on candidates understanding.

<b>Q. 1 A) Attempt any THREE of the following.</b>	<b>12</b>
<b>a) Draw graphical symbols for following as per IS 962-1989. BM, concrete, Woodwork , Glass</b>	

B.M.		1 mark for each
concrete		
Wood Work		
Glass.	 OR 	

**b) Draw any Four type of lines used in Civil Engg. Drawing**

<p>Outline of parts.  Thick (0.6 to 1.0 mm)</p> <p>Dimension, Extension, construction &amp; Hatching lines.  Thin (0.2 to 0.3 mm)</p> <p>Hidden lines.  Medium (0.35 to 0.5 mm)</p> <p>Centre &amp; locus lines.  Thin (0.2 to 0.3 mm)</p> <p>Cutting plane lines.  Thick (0.6 to 1.0 mm)</p> <p>Break lines for short break.  Thick (0.6 to 1.0 mm)</p> <p>Break lines for long break.  Thin (0.2 to 0.3 mm)</p> <p style="text-align: center;">(*Note-1 mark for each , any 4 lines)</p>	*
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<p><b>c) Define FSI. How you will calculate plinth area from carpet area?</b></p>	
<p>Floor space index is defined as a ratio of total built-up area of all floors to the plot area</p> $\text{FSI} = \frac{\text{total built-up area of all floor}}{\text{Area of Plot}}$ <p>Plinth Area = Carpet area + Wall thickness of all units + Area which is excluded in calculation of carpet area.</p>	<p>2 marks</p> <p>2 marks</p>
<p><b>d) Specify minimum dimensions of following units of residential building.</b> <b>Living room, Bedroom, Kitchen, WC.</b></p>	
<p>1) Living room :-9.5 sqm (mini 2.4 m wide)    2) Bedroom :- 9.5 sqm (mini 2.4 m wide) 3) Kitchen:- 4.5 sqm (mini 1.8 m wide)    4) WC :- 1.1 sqm (general size 1.1 m x1 m)</p>	<p>1 Mark each</p>
<p><b>B) Draw to a suitable Scale a line plan of post office building .Label all units with their dimensions. Clearly indicate position of openings.</b></p>	<p>08</p>
<div style="text-align: center;"> <p style="text-align: center;">Line plan of a post office. Scale 1:100</p> </div> <p>(*Note-Correct line plan 3 marks ,lebbeling-2 marks ,dimension2marks neatness 1 marks)</p>	<p>*</p>

**Q2. Fig No.1: Show a line plan of residential building .Draw to a scale of 1:50 the following views. Show all Dimensions and label the units. Use appropriate symbols for room furnishings such as WB, WC, kitchen Sink, Otto, cupboards etc.**

**I) Developed plan**

12

**II) Elevation**

06

**III) Section along AB**

10

**Use following construction notes-**

**Depth of foundation 1200mm below GI**

**Plinth height above GL 600mm**

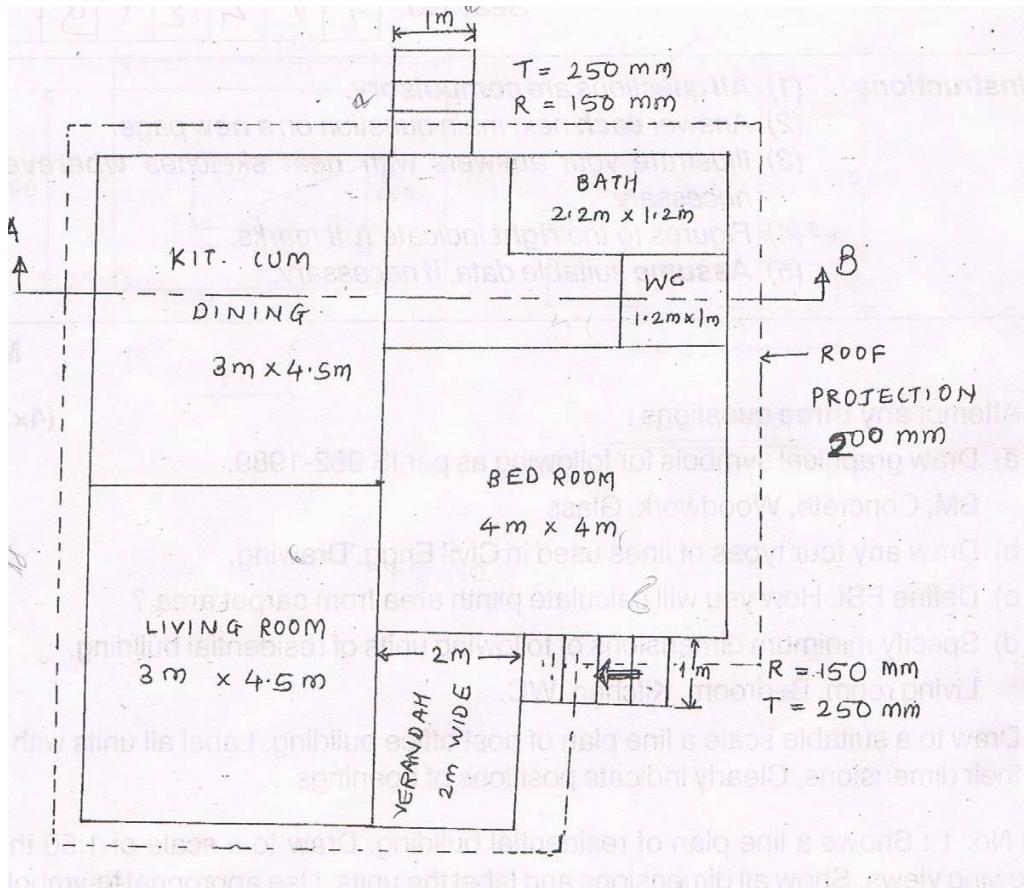
**Height of bottom of slab from FL=3200mm**

**Slab thickness-150mm**

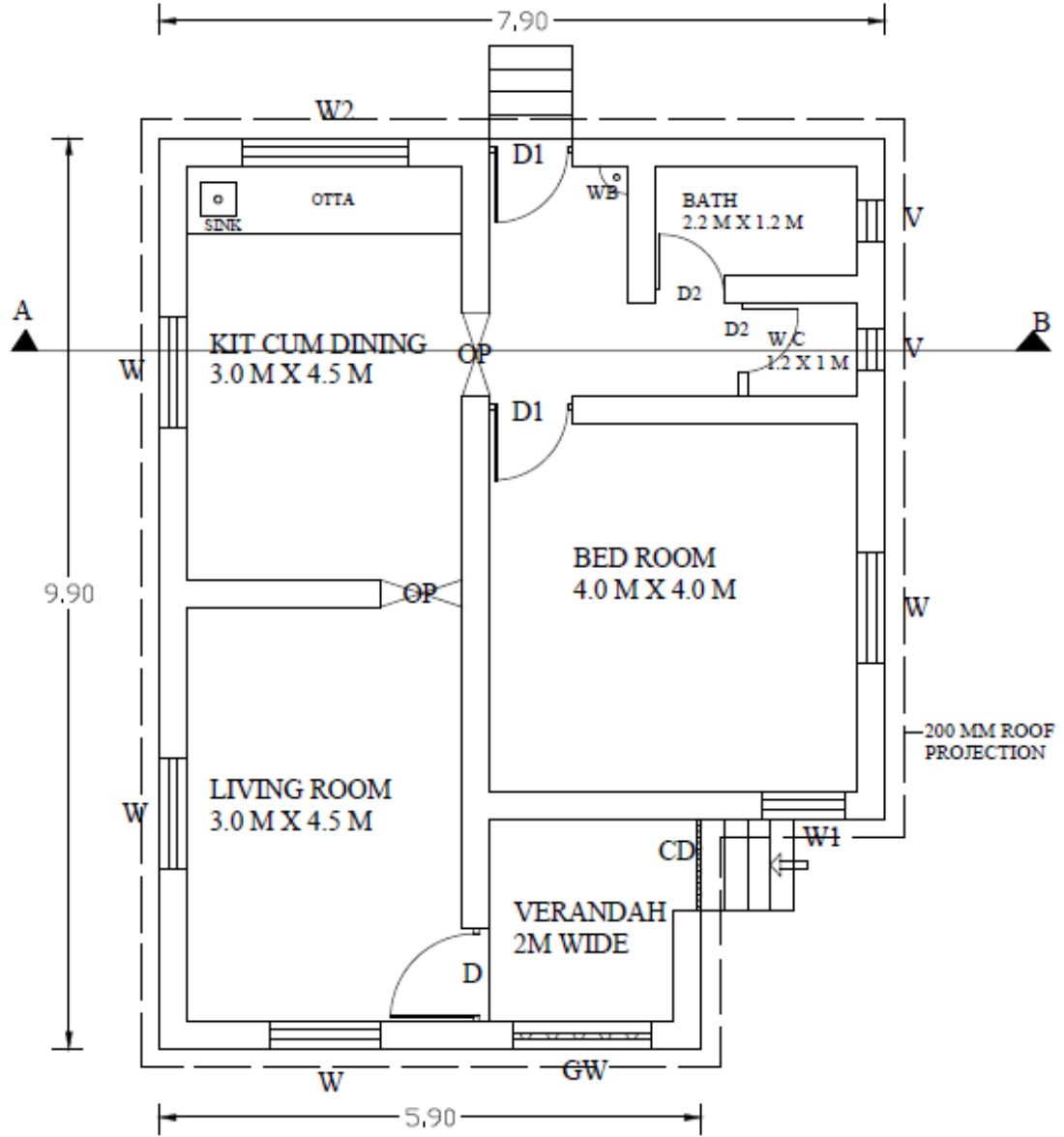
**Chajja Projection -750mm**

**Super Structure in BBM with all walls 300 mm thick.**

**Assume additional data is required.**

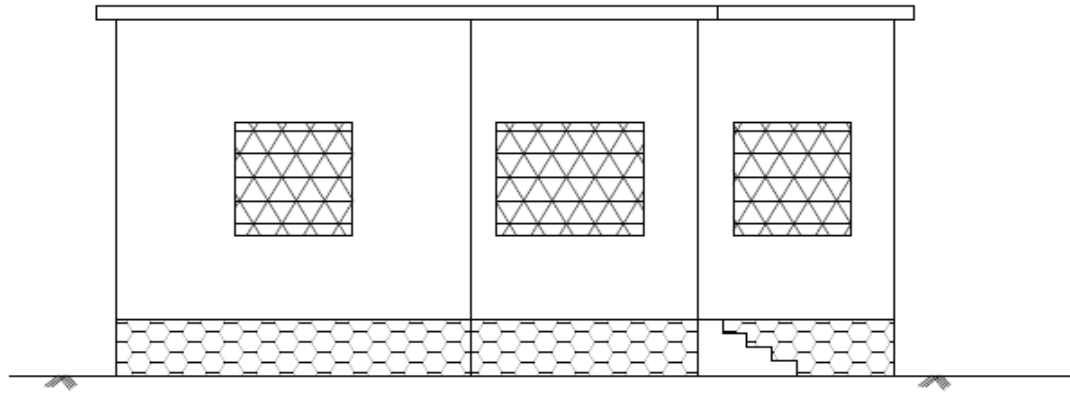


**Fig.No.1 Line plan**



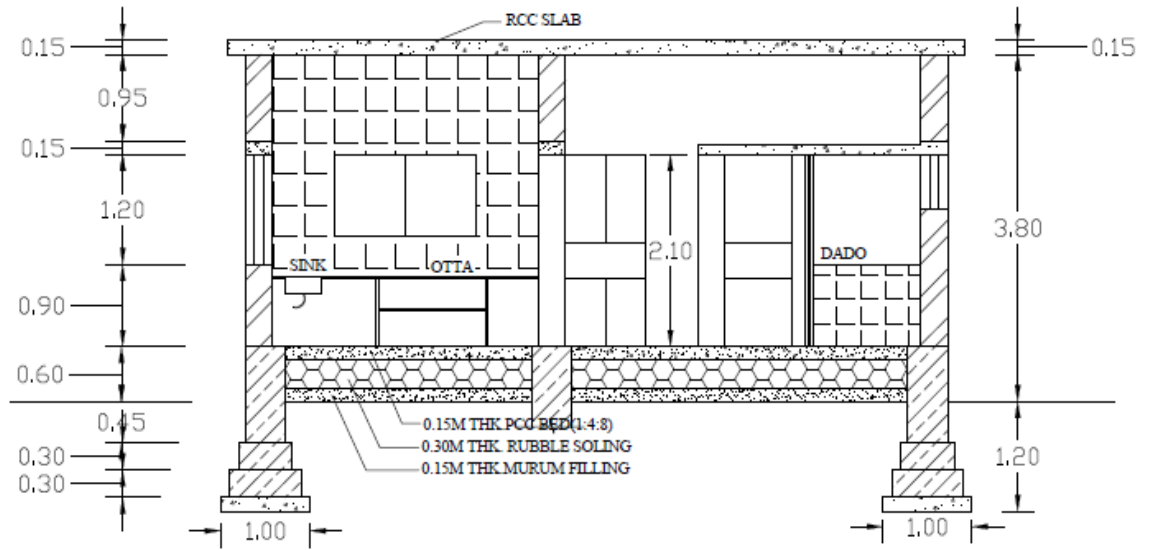
**DEVELOPED PLAN**  
(SCALE 1:50)

(\*Note-developed plan 4 marks ,lebbeling-2 marks ,dimension2 marks ,doors and windows3 marks neatness 1marks)



## ELEVATION

(\*Note-Correct elevation 4 marks , neatness 2 marks)

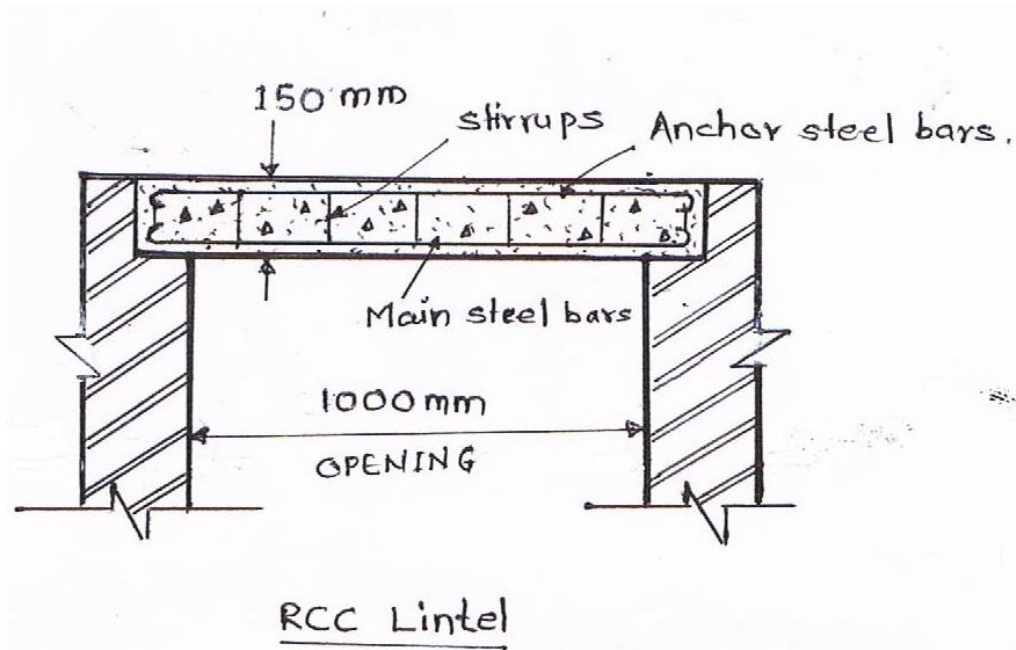


## SECTION AB

(\*Note-Correct section 4 marks ,lebeling-1 marks ,all dimension 2 marks ,material symbol 2 marks neatness 1 marks)

**Q3. Attempt any THREE of the following.**

a) Draw a neat sketch showing RCC components of lintel with 1:20 scale



(\*Note-Correct sketch 4 marks ,lebbeling-2 marks ,dimension 1marks neatness 1 marks)

b) Prepare Schedule of openings in the Slandered format and area statement for building in Q.No .2

.SCHEDULE OF OPENINGS						
SR NO	ITEM	SYMBOL	N O	SIZE	DESCRIPTION	REMARK
1	DOOR	D	1	1.0 X 2.1 M	FLUSH DOOR WITH T.W.FRAME ,SIGNAL	EXTERNAL DOOR
2	DOOR	D1	2	0.9 X 2.1 M	FULLY PANELLED DOOR IN T.W.FRAME ,SIGNAL SHUTTER TYPE	INTERNAL DOOR
3	DOOR	D2	2	0.75 X 2.1 M	PARTLY PANELLED AND PARTLY GLAZED DOOR, SIGNAL 4 SHUTTER TYPE	IN W.C AND BATH

4	OPENING	OP	2	0.9 X 2.1 M	-	-
5	COLLAPSIBLE DOOR	CD	1	1.5 X 2.1 M	M.S.RIVETED CHANNELS	EXTERNAL
6	WINDOW	W	4	1.2 X 1.2 M	FULLY GLAZED WINDOWS	IN LIVING ROOMS
7	WINDOW	W1	1	0.9 X 2.1M	FULLY GLAZED WINDOWS WITH VENTILATORS AT TOP	IN LIVING ROOMS
8	WINDOW	W2	1	1.8 X 0.9 M	FULLY GLAZED WINDOWS	BED ROOM
9	GRILLS	GW	1	1.5 X 2.1 M	M.S SQUARE BARS (12MM)	VERANDAH
10	VENTILATOR	V	2	0.45 X 0.6 M	LOUVERED WINDOW	IN W.C

**SCHEDULE OF AREA STATEMENT**

SR.NO	ITEM	AREA IN SQM
01	PLOT AREA	157 SQM
02	BUILT UP AREA	73.21SQM
03	FSI	0.4663

(\*Note-Correct schedule of openings 5 marks , Correct schedule of area statement 1 mark for each )

**C) Explain any four important Principles of planning**

**Important of Principal of planning:-**

**1) Aspect:-** Different rooms of the building are placed and located according to the functional utility in such a way that maximum advantage from natural elements like sun ,wind can be obtained .Sunlight provides the illumination inside the rooms in day time and we need not to use artificial lighting .

**2) Prospect:-**It is a related a views as seen of the outside from the door and the windows in the external in the internal Walls .For pleasant atmosphere views of a garden ,hill and river etc.

**3) Orientation:-**It is the method of proper placement of planned units of the building in relation to natural elements like sun, rain, wind, outlook, topography etc. the position of building is decided with respect to “North”, to place the different units or room to achieve natural ventilation ,air circulation and lighting ,or Orientation is necessary to achieve maximum advantage from natural elements.

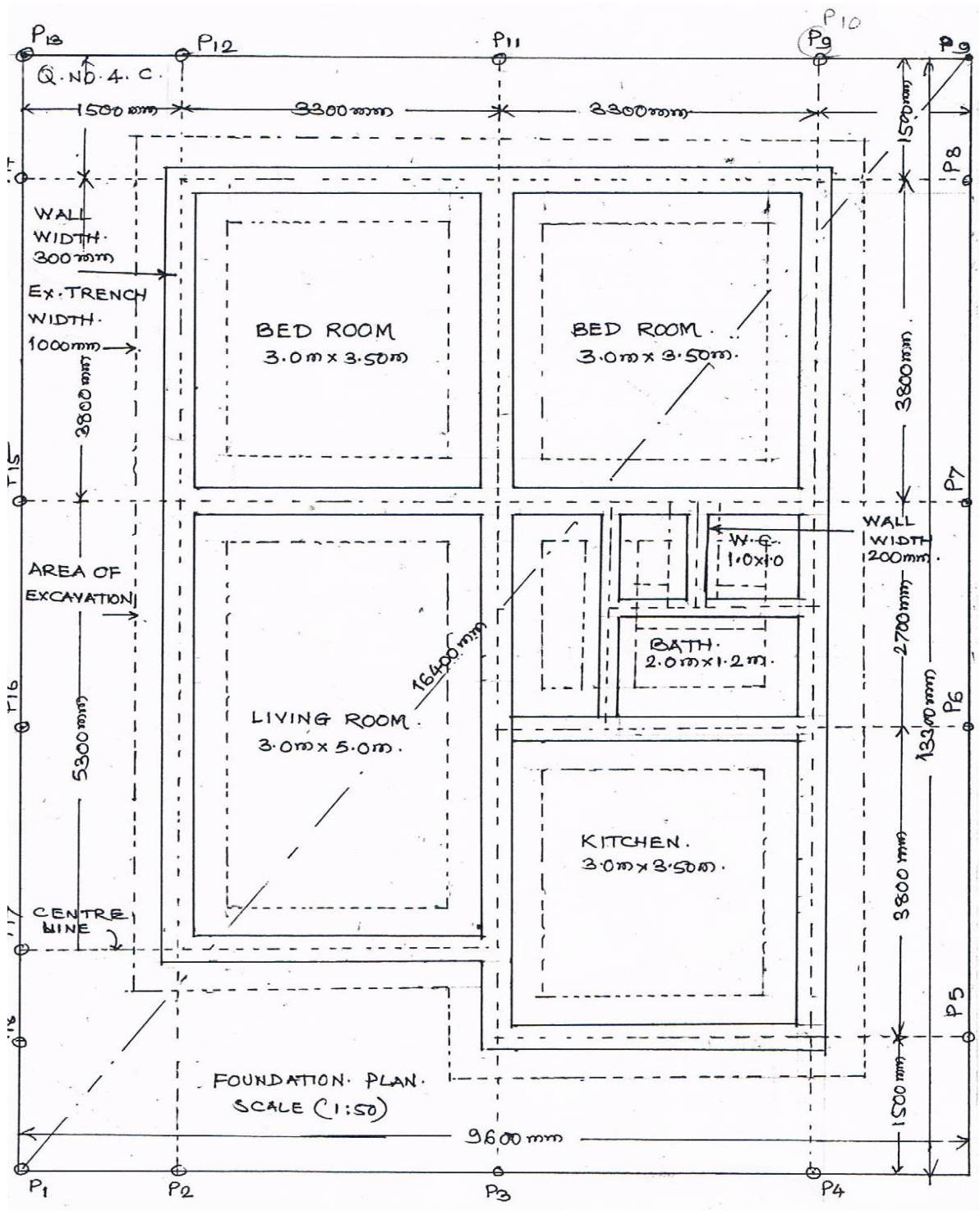
**4) Grouping:-**It is the arrangement of various room with respect to their function .Grouping various according type of building ,residential or public (hospital ,library ,bank, school etc).proper grouping helps in deterring shape of building should be placed in sequential

\*



<p>order their utility or function ,without disturbing the other unit.</p> <p><b>5) Privacy:-</b>It is the very important factor to be considered while planning both residential and public building. in case public building like Offices etc. There are two types of privacy i.e internal privacy and external privacy.</p> <p><b>6) Elegance: -</b> It is a term related to the effect produced by elevation. Elevation can be imagined while preparing plan to produced elegance. Elegance Depends upon planning as well as elevation, without elevation a properly planned building may not look beautiful.</p> <p><b>7) Flexibility:-</b> In case of public building the plan provide flexibility from future expansion point of view .a room plan as staff room may later be used as activity room as store after the expansion of building.</p> <p><b>8) Roominess:-</b> The principal of planning is directly related with dimension of the room .It is must select dimension i.e. length ,width and height after area of room is finalized. Light colors give effect of more space whereas dark colors make the room's look smaller.</p> <p><b>9) Circulation:-</b> Circulation movement of the user inside the units of building, from one unit to another at the same floor or even movement from one floor to the another.</p> <p>10) Furniture requirements: - Requirements Furniture in the room can be deciding the size of unit.e.g A living room can be planned to accommodate a sofa set, Teapot, Diwan, T.V.cabinate, shoe rack etc.</p> <p><b>11) Economy</b> It is a factor which restrict the freedom of planning of building by an architect. A proper scope of future expansion should be considered.</p> <p style="text-align: center;"><b>(*Note-2 marks for each , any four)</b></p>	
<p><b>d) I) Write dimension of rise and tread for residential and public building</b></p>	
<p>Ans:- 1) Rise for residential building. -170 to190 mm  2) Tread for residential building.-250 mm  3) Rise for Public building.-150mm to 170mm  4) Tread for Public building. -300 mm to 325mm</p>	<p>1 1 1 1</p>
<p><b>II) Enlist type of perspective drawing and specify two Principal used in prospective drawing.</b></p>	
<p><b>Types of Perspective drawing</b></p> <p>a) Based on position of object with respect to picture plane :-  I) parallel perspective  II) oblique perspective</p> <p>b) Based on No of Vanishing point :-  I) One point perspective  II) Two point perspective  III)Three point perspective</p> <p><b>Principal used in prospective drawing:-</b></p> <p>1) The lines appear to be shorter than their actual length, and his effect increase, as the distance of the object increase.</p> <p>2) The picture of all points and lines on the picture play coincides with the points and lines themselves.</p> <p>3) Perspective of all the parallel lines which are also parallel to the picture plane .not parallel to the picture plane, converge to a point</p>	<p>1 1 2 marks (any two)</p>

<b>Q4. Attempt any TWO questions:</b>	16																																		
<b>a) Explain important rules and byelaws of sanctioning for authorities for constriction in rural area.</b>																																			
<p><b>Important rules and bye laws of sanctioning authorities for constriction in rural area are.-</b></p> <ol style="list-style-type: none"> <li>1) The prospered building must be in residential zone.</li> <li>2) The minimum Front margin should be 3.00m</li> <li>3) The minimum side and rear margins should be 1.50 m.</li> <li>4) The maximum No of storey should be (G+1).</li> <li>5) The maximum allowable built up area should be 60% of total plot area.</li> <li>6) The minimum Height of plinth should be 450 mm.</li> <li>7) The Maximum Height of Slab should be 2.75 m.</li> <li>8) The FSI in rural area is one</li> </ol>	1 marks for each																																		
<b>b) Enlist units of Primary health center and write minimum dimension of each unit including sanitary unit.</b>																																			
<p><b>Unit of primary health center :-</b></p> <table border="0"> <tr> <td>1) Entrance and waiting space</td> <td>2.5 m wide (minimum)</td> </tr> <tr> <td>2) Doctor's Room</td> <td>3.0 m x 3.6 m.</td> </tr> <tr> <td>3) Operation Theatre</td> <td>4.0m x 6.0m.</td> </tr> <tr> <td>4) Examination room</td> <td>3.0m x 4.0m.</td> </tr> <tr> <td>5) Circulation space</td> <td>3.0m side</td> </tr> <tr> <td>6) Words</td> <td></td> </tr> <tr> <td>    I) General</td> <td>8 to 10<sup>m<sup>2</sup></sup>/bed.</td> </tr> <tr> <td>    II) Maternity</td> <td>8 to 10<sup>m<sup>2</sup></sup>/bed</td> </tr> <tr> <td>7) Medical store</td> <td>3.5m x 5.0 m.</td> </tr> <tr> <td>8) Office</td> <td>3.0 x 4.0m.</td> </tr> <tr> <td>9) Laboratory</td> <td>3.0m x 5.0m</td> </tr> <tr> <td>10) Family planning Unit</td> <td>3.0 m x 4.0m</td> </tr> <tr> <td>11) Parking Space</td> <td></td> </tr> <tr> <td>12) Sanitary Block</td> <td></td> </tr> <tr> <td>    I) W.C</td> <td>1.0m x 1.2m.</td> </tr> <tr> <td>    II) Bath room</td> <td>1.5m x 2.5m</td> </tr> <tr> <td>    III) Urinals</td> <td>0.6m x 0.9</td> </tr> </table>	1) Entrance and waiting space	2.5 m wide (minimum)	2) Doctor's Room	3.0 m x 3.6 m.	3) Operation Theatre	4.0m x 6.0m.	4) Examination room	3.0m x 4.0m.	5) Circulation space	3.0m side	6) Words		I) General	8 to 10 <sup>m<sup>2</sup></sup> /bed.	II) Maternity	8 to 10 <sup>m<sup>2</sup></sup> /bed	7) Medical store	3.5m x 5.0 m.	8) Office	3.0 x 4.0m.	9) Laboratory	3.0m x 5.0m	10) Family planning Unit	3.0 m x 4.0m	11) Parking Space		12) Sanitary Block		I) W.C	1.0m x 1.2m.	II) Bath room	1.5m x 2.5m	III) Urinals	0.6m x 0.9	½ marks for unit & <b>1/2</b> for dimension (any eight)
1) Entrance and waiting space	2.5 m wide (minimum)																																		
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<b>c) Draw foundation plan for 2BHK residential building .Assume suitable sizes. Use Scale 1:50 (building load bearing type).</b>																																			



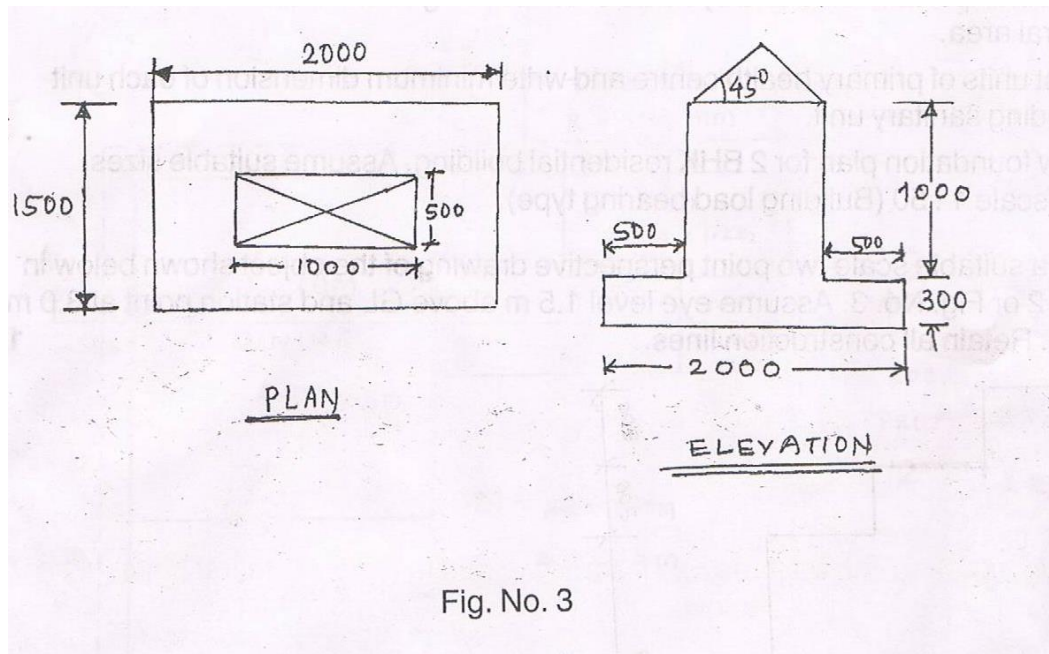
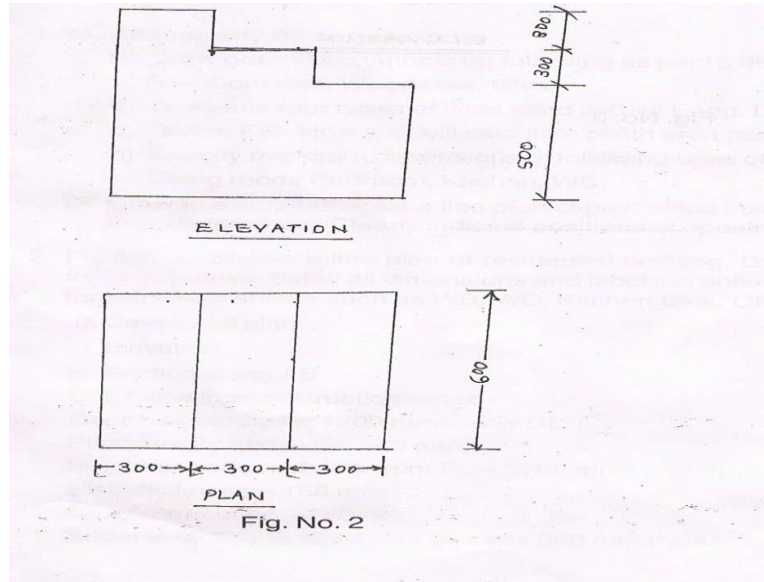
Note:-Figure not to scale

(\*Note-correct foundation plan 4 marks .centre line dim.2marks,reference pillar 1marks

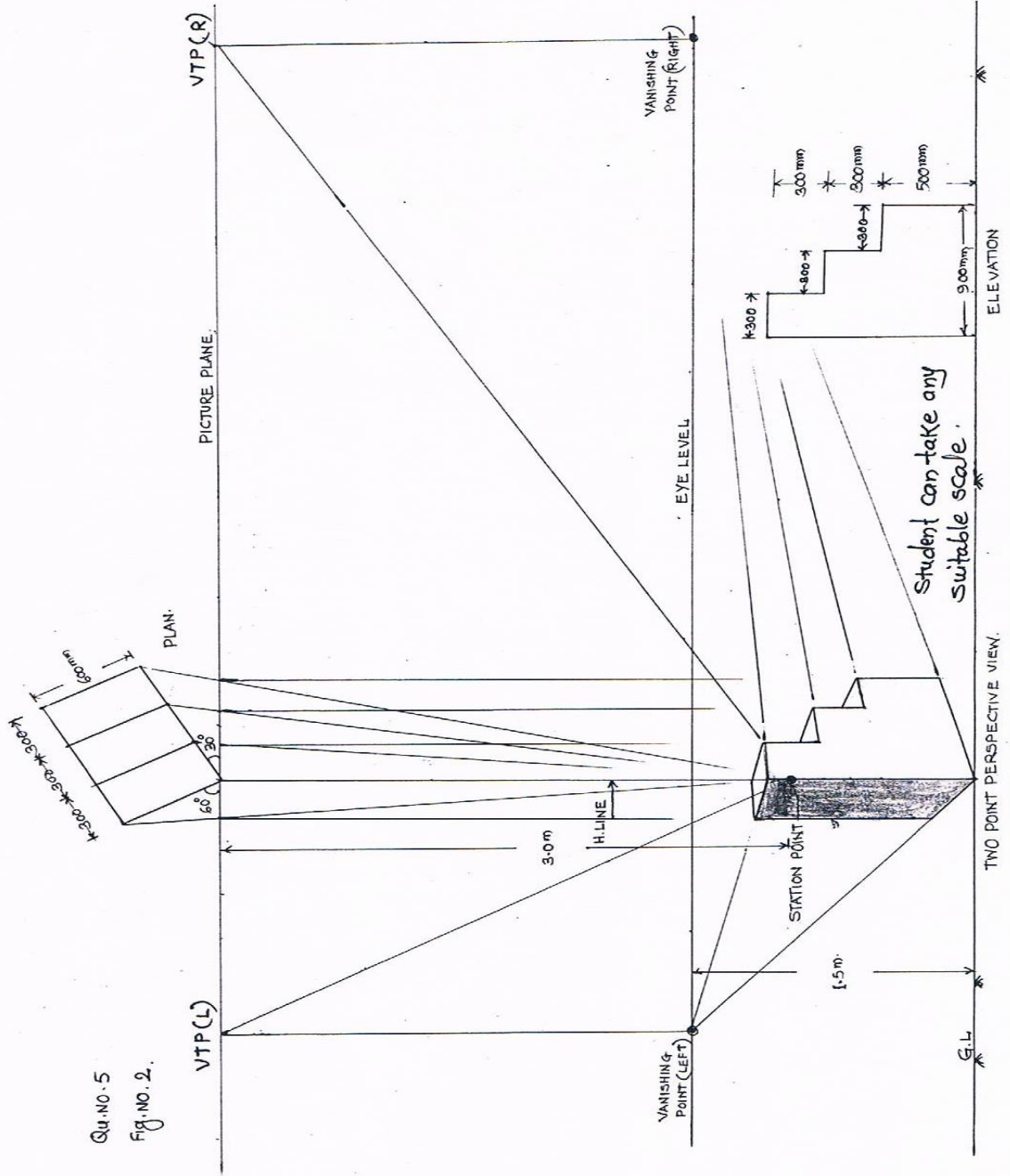
&neatness 1 marks )

**Q5. Draw to a suitable scale two point perspective drawing of the object shown below in fig.No.2 or Fig .No.3 .Assume eye level 1.5m above GL and station point at 3.0m from PP.Retain all construction lines.**

12



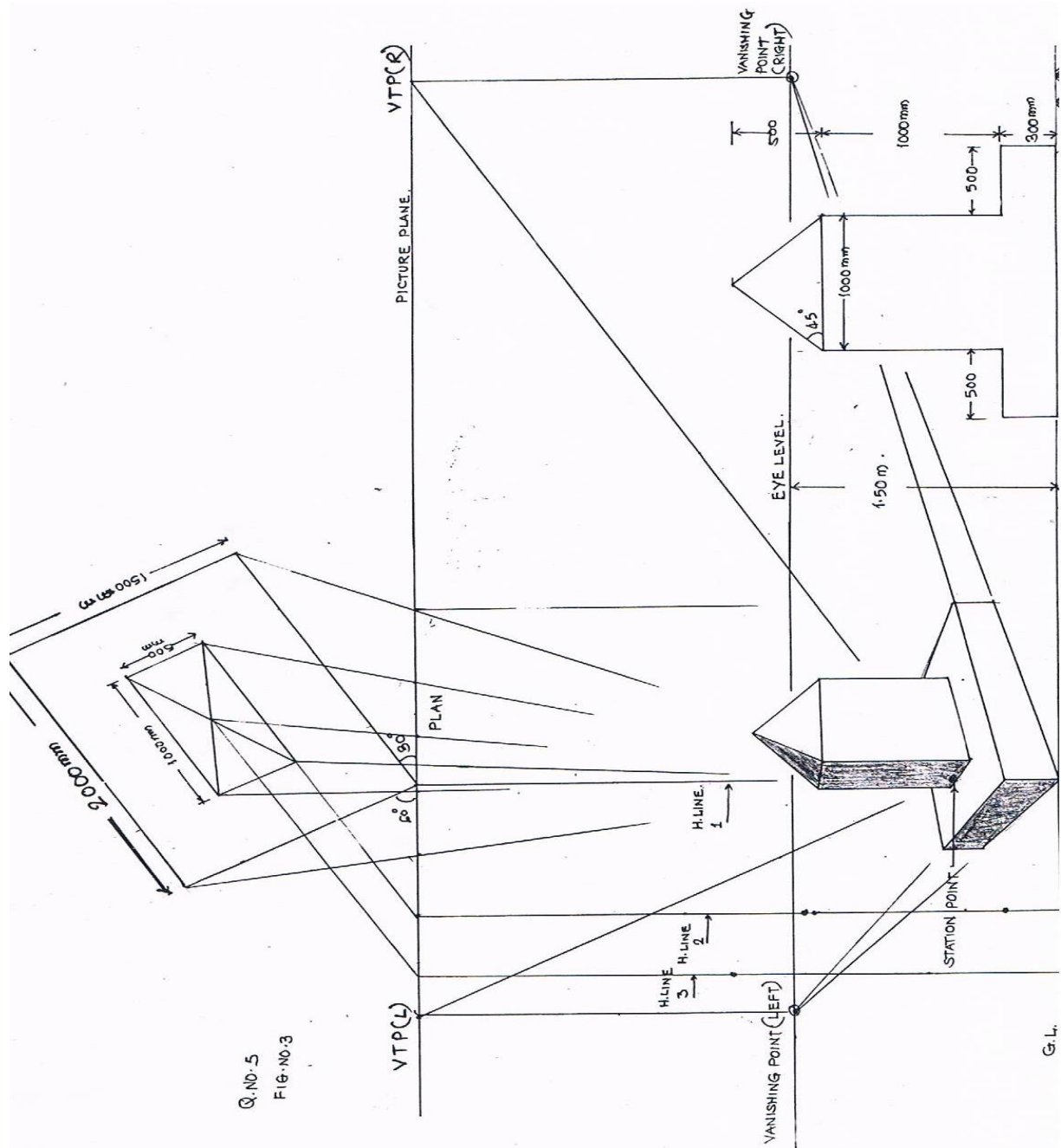
**Ans:-**



Note:-Figure not to scale

(\*Note-2 marks for plan , 1mark for elevation, construction lines 2 marks ,eye level 1 marks ,station

point 1 marks and correct object 5 mark)



Note:-Figure not to scale

(\*Note-2 marks for plan , 1mark for elevation, construction lines 2 marks ,eye level 1 marks ,station point 1 marks and correct object 5 mark)