



MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION  
(Autonomous)

(ISO/IEC -270001 – 2005 certified)

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SUMMER -2017 EXAMINATION

Subject code: 17309

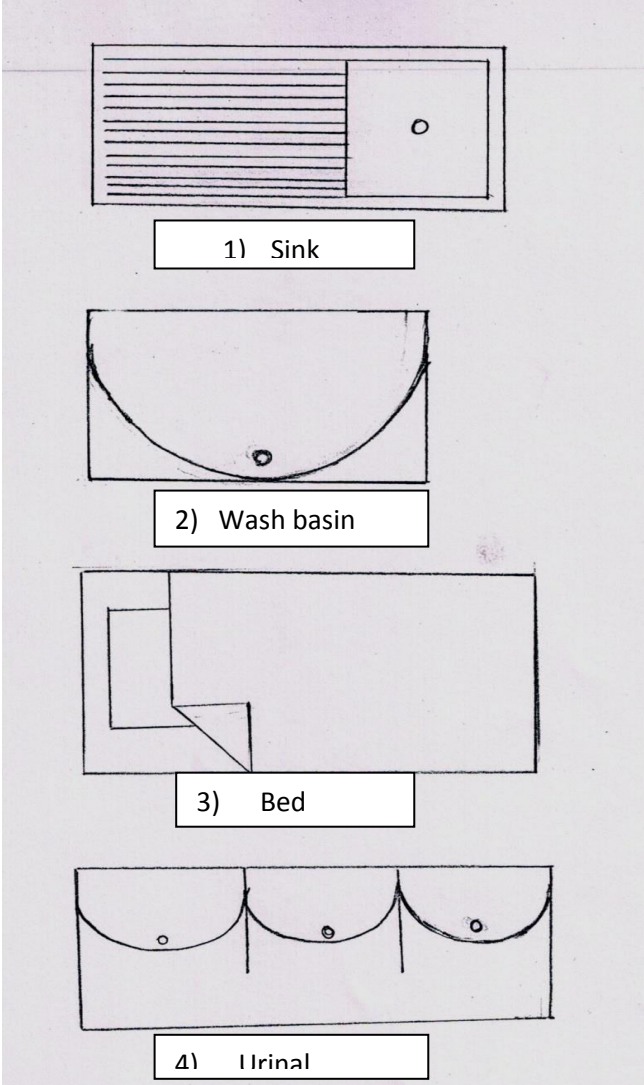
Model Answer Page No: 01/13

**Important Instructions to examiners:**

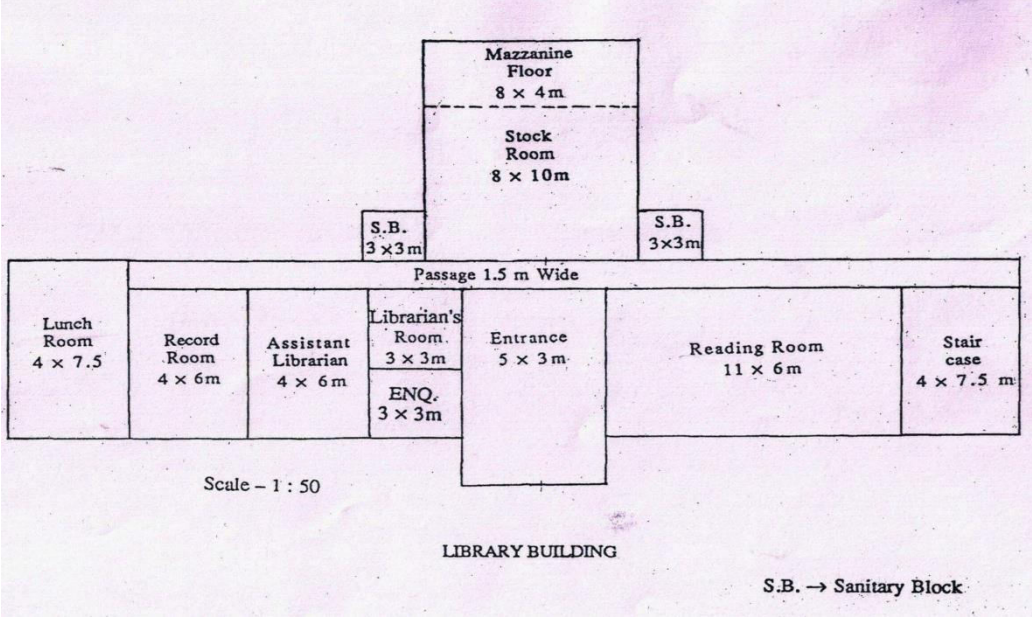
- 1) The answer should be examined by keywords and not as word-to-word as given in the model answer scheme.
- 2) The model answer and the answer written by candidate may vary but the examiner may try to assess the understanding level of the candidate.
- 3) The language error such as grammatical, spelling 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

**Important notes to examiners:**

1. **In Question 1(a) (ii)** If the Student write examples instead of sketch, so accordingly gives credit to them.
2. **In Question 1(b)** Student may draw any appropriate plan related to library building, so accordingly gives credit to them

Q.NO	Question and Model Answers	Marks
Q.1.a	Attempt any <b>THREE</b> of the following:	12 M
(i)	Draw conventional symbol for	04M
	 <p>1) Sink</p> <p>2) Wash basin</p> <p>3) Bed</p> <p>4) Urinal</p>	01 M each
(ii)	Explain with sketch principle of privacy	04M
	<p><b>Privacy</b> – Privacy means isolating room or building from surrounding. It is of two types.</p> <p><b>a) Internal Privacy</b> –</p> <p>i) In Internal privacy, the direct view inside any room from any other room or passage, lobby is prevented.</p> <p>ii) Internal privacy plays an important role in circulation of inside of the building.</p> <p><b>Examples:</b></p> <p>i) All doors should be placed at corners, placing of single shutter doors offer more privacy than double shutter doors.</p> <p>ii) By proper furniture arrangement.</p> <p>iii) Use of partitions.</p>	04*M

	<p><b>b) External Privacy –</b></p> <p>i) In External privacy, the direct view of the building from surrounding buildings and roads is obstructed.</p> <p>ii) Also privacy from noise and pollution from the road.</p> <p><b>Examples:</b></p> <p>i) By providing compound wall of sufficient height (1.35m -1.50m) on plot boundary.</p> <p>ii) Planting trees around building.</p> <p>iii) Verandah is to be planned in the front side to maintain external privacy.</p> <p><b><u>Note1: If the Student write examples instead of sketch, so accordingly gives credit to them.</u></b></p> <p style="text-align: center;"><b>*(Note-01M for Each define and 01 M for each example)</b></p>	
(iii)	<b>Write any eight construction notes for load bearing structure.</b>	<b>04M</b>
	<p><b>Construction Notes :</b></p> <p>i) Hard murum is available at a depth of 0.90 m below G.L.</p> <p>ii) PCC (1:4:8) bed, 200 mm thick provided in foundation.</p> <p>iii) UCR in CM (1:6) in foundation and plinth.</p> <p>iv) Height of plinth 60 cm above G.L. and plinth offset 75 mm.</p> <p>v) Super structure – BB Masonry in CM (1:5), 30 cm thick; partition wall in WC and Bath, 10 cm thick.</p> <p>vi) Height of wall from floor level to bottom of slab is 3.0 m.</p> <p>vii) R.C.C. slab 100 mm thick, projection of slab – 150 mm.</p> <p>viii) Mosaic tile flooring is provided for all room except WC and Bath.</p> <p>ix) Glazed tiles are provided in WC and Bath with dado upto 1.20 m above floor level.</p>	<b>½ M each for any 08 points</b>
(iv)	<b>State principles of perspective view.</b>	<b>04M</b>
	<p><b>Principles of perspective view:</b></p> <p>i) The lines appear to be shorter than their actual length, and this effect increases as the distance of the object increases.</p> <p>ii) The picture of all points and lines on the picture plane coincides with the Points and lines themselves.</p> <p>iii) Perspective of all parallel lines which are also parallel to the picture plane are themselves parallel.</p> <p>iv) Vertical lines such as trees, corners of building and poles appear truly vertical. i.e. perspectives of the vertical lines are vertical</p> <p>v) Perspectives of horizontal lines which are parallel to the picture plane are horizontal except those at eye level do not appear horizontal.</p> <p>vii) Perspective of all parallel lines, which are not parallel to the picture plane converge to a point (Vanishing Point).</p> <p>vii) Perspective of parallel lines which are parallel to the vertical plane converge to a vanishing point on the vertical line.</p> <p>viii) Perspective of horizontal line appear to vanish on the horizontal line or converge to a vanishing point on the horizontal line.</p>	<b>01 M each for any 04 points</b>

Q.1 b)	Draw a line plan to scale 1:50 for a library building at district level.	08 M
	 <p style="text-align: center;">Scale - 1 : 50</p> <p style="text-align: center;">LIBRARY BUILDING</p> <p style="text-align: right;">S.B. → Sanitary Block</p> <p style="text-align: center;"><u>(ALL DIMENSIONS IN METER)</u></p> <p>*( Line plan 4 Marks, Units 2 Marks, Dimensions 2 Marks, Doors and Windows are optional here.)  <u>Note: Student may draw any appropriate plan related to library building, so accordingly give credit to them.</u></p>	08*M
Q.2.	<p>Figure No. 1 shows line plan of a residential building. Draw to a scale 1: 50 the following views.</p> <p>i) Developed plan  ii) Elevation.  iii) Section along AB.</p> <p>Use following construction notes-</p> <ol style="list-style-type: none"> <li>1) Depth of foundation 1.30 m below GL.</li> <li>2) Plinth height above GL 800 mm</li> <li>3) Ceiling Height 2850 mm</li> <li>4) Wall Thickness 300 mm for external and 230 mm for internal wall.</li> <li>5) Slab Thickness 120 mm.</li> <li>6) Chajja 600mm Projection</li> <li>7) UCR masonry 500 and 700 mm wide in foundation and depth 550 mm each.</li> <li>8) Assume suitable data if required.</li> </ol>	12 M 08 M 08 M
	<p><u>Important Note: Student may draw Plan, elevation and section by using other suitable scale than 1: 50. So give credit accordingly.</u></p>	

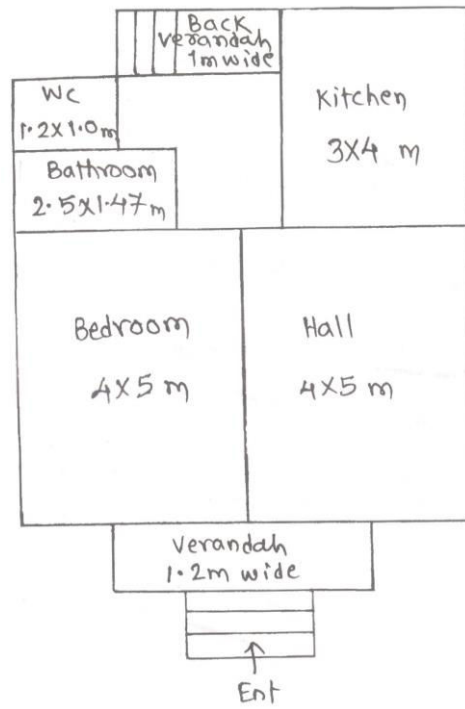
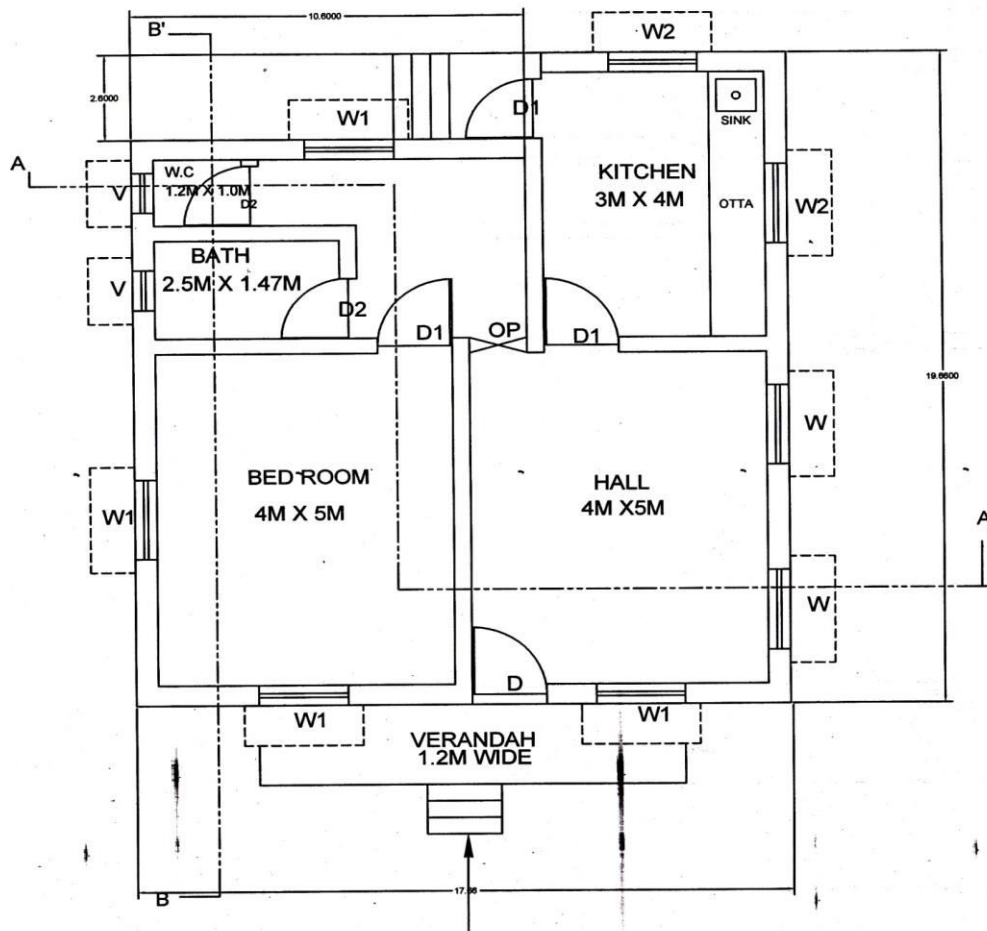


Fig.No.1 Line Plan

(i) Developed plan

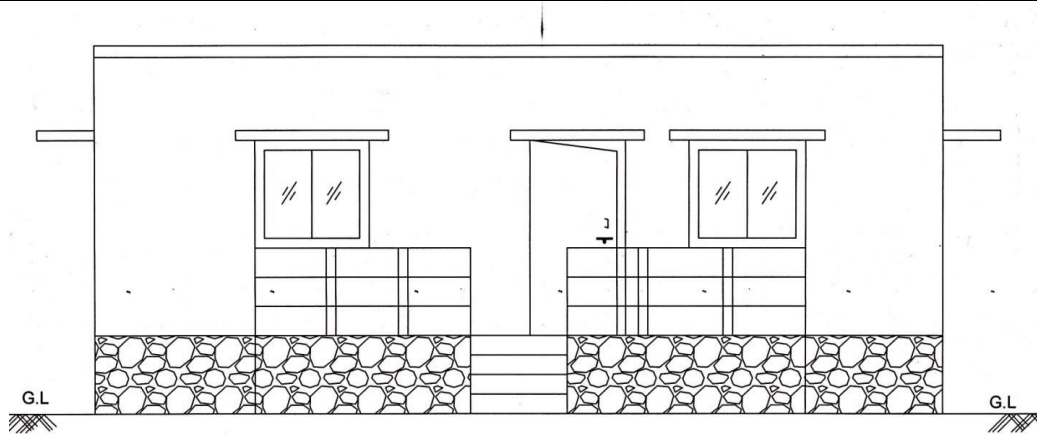


DEVELOPED PLAN (SCALE : 1 : 50)

12\*M

**\*(Note: Wall thickness - 02 marks, Labeling- 02 marks, Dimension- 02 marks, Position of Window – 02 marks & Door – 02 marks, Neatness – 02 Marks)**

**(ii) Elevation**

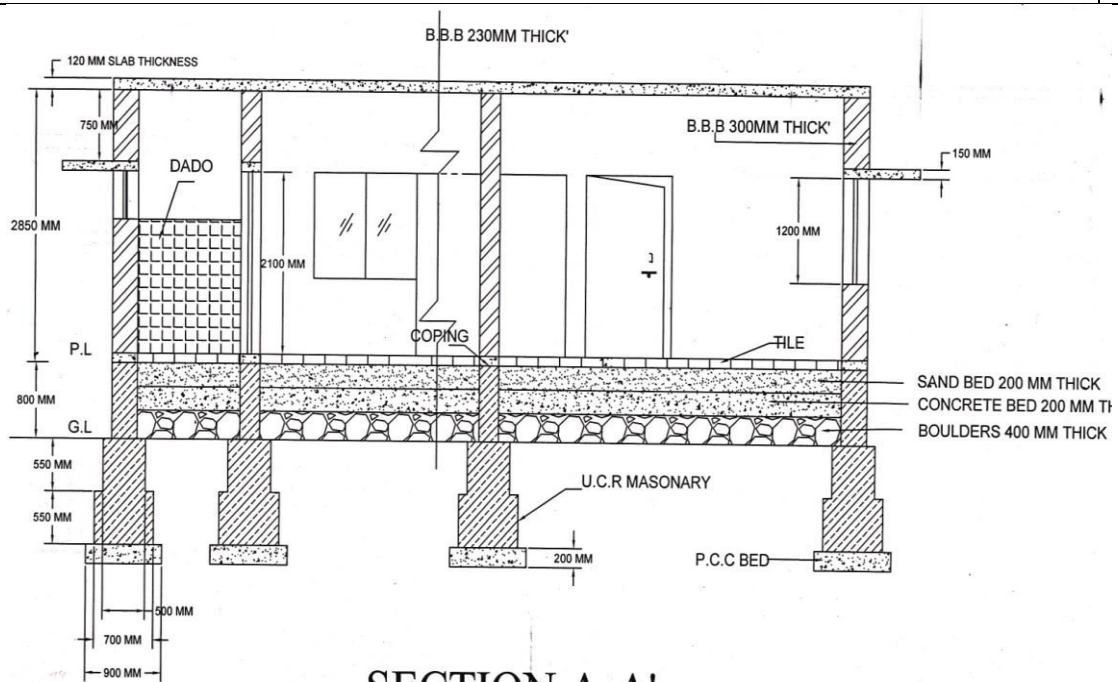


**08\*M**

**ELEVATION**

**\*(Note: Projected Line work- 02 marks, Correct Elevation- 04 marks, Neatness – 02 Marks)**

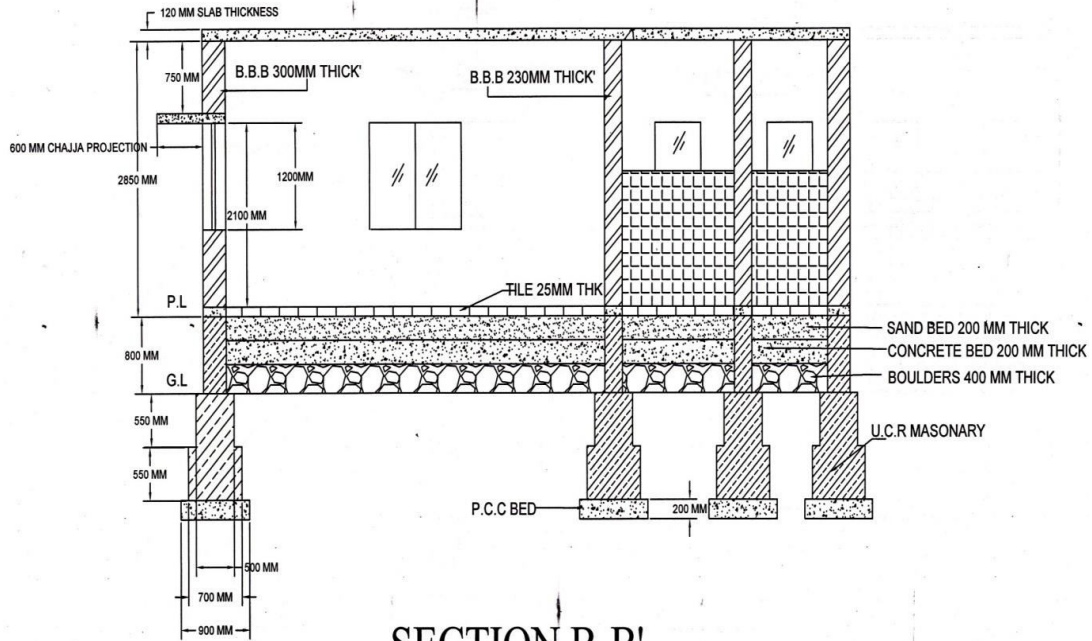
**(iii) Section along AB**



**08\*M**

**SECTION A-A'**

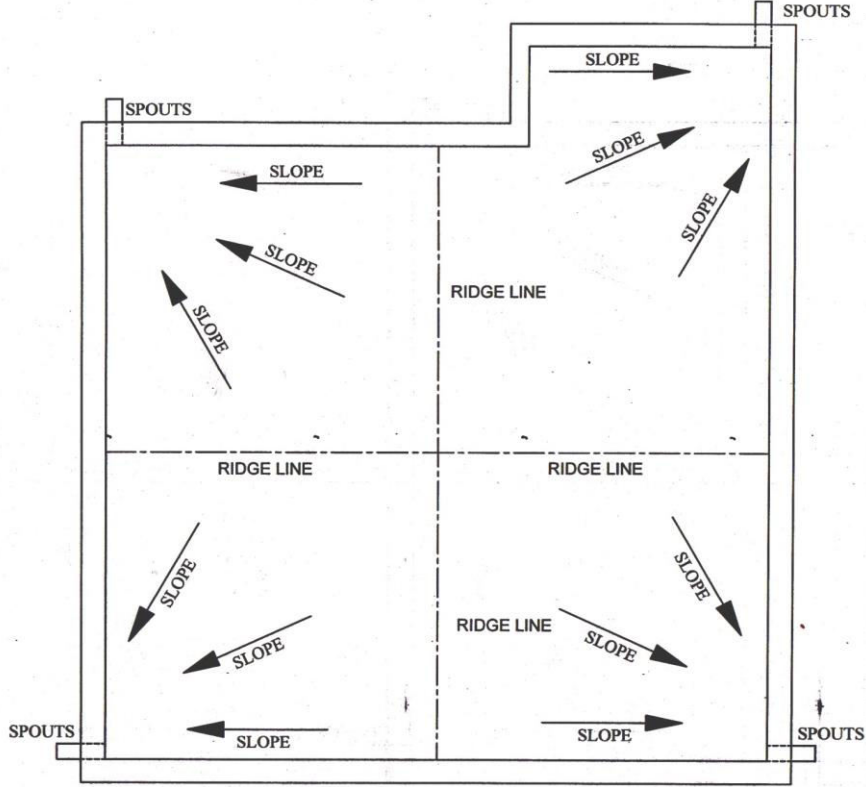
**\*(Note: Correct Section - 04 marks, All Dimensions - 02 marks, Material Symbols – 02 Marks)**



## SECTION B-B'

**\*(Note: Correct Section - 04 marks, All Dimensions - 02 marks,  
Material Symbols – 02 Marks)**

**(Note: Section Line AB is not provided in given Plan so student may assume  
any one Suitable section line give proportionate marks to students).**

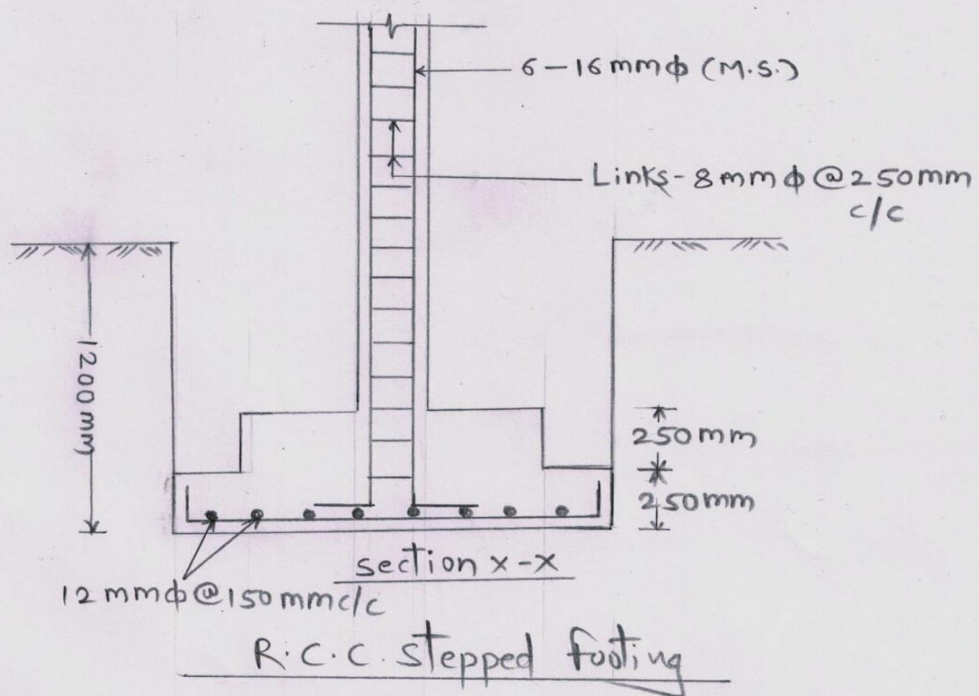
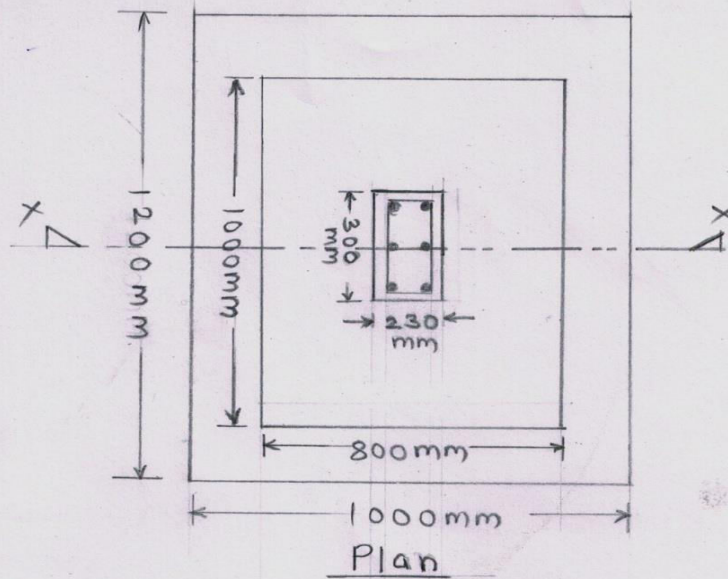
<b>Q.3</b>	<b>Attempt Any THREE of the following</b>	<b>24M</b>
a)	<b>Draw to a suitable scale terrace plan of the building mentioned in Question No.2.</b>	<b>8M</b>
	 <p style="text-align: center;"><b>TERRACE PLAN</b> (Scale: 1:100)</p>	<b>08*M</b>
	<p><b>*(Note: Correct Plan - 04 marks, Ridge Line ,Slope Line - 02 marks, Spouts – 01 Marks,Neatness-01Mark)</b></p>	
b)	<b>Prepare area statement for building mentioned in question no-2, Take plot size 18m x 25 m. Calculate FSI consumed.</b>	<b>8M</b>
	<p>i) Plot Area=18 x 25 =<b><u>450 Sq.m.</u></b></p> <p>ii) Built up Area:</p> <p>a) Area A= 8.83 x 9.83 = 86.79 Sq.m.</p> <p>b) Area B = 5.30 x1.30 =6.89Sq.m.</p> <p>Built up area = Area A - Area B</p> <p style="text-align: center;">= 86.79 – 6.89 = <b><u>79.9 Sq.m.</u></b></p> <p>iii) Carpet Area = (4 x 5) + (4 x 5) = <b><u>40 Sq.m.</u></b></p> <p>iv) FSI = Built up area / Plot Area</p> <p style="text-align: center;">= 79.9 / 450 = <b><u>0.1775</u></b></p> <p><b>*(Note: 02 M each for point with correct values)</b></p>	<b>08*M</b>



<b>c)</b>	<b>State various units required for bank building at district place.</b>	<b>08M</b>										
	<p>Units required for bank building at district place :</p> <ol style="list-style-type: none"> <li>1) Manager cabin</li> <li>2) Safe deposit vault</li> <li>3) Lunch / Tiffin room</li> <li>4) Strong room</li> <li>5) Toilet block</li> <li>6) Meeting hall</li> <li>7) Clerk counters</li> <li>8) Record room</li> <li>9) Cashier cabin</li> <li>10) Reception/ Enquiry counter</li> <li>11) Drinking water fountain / place</li> <li>12) Loan Division</li> <li>13) ATM</li> <li>14) Security cabin</li> <li>15) Server Room</li> <li>16) Waiting area / place</li> </ol>	<b>01 mark for each any 08 points</b>										
<b>d)</b>	<b>Define perspective view, picture plane, station point, true height and give any four differences between one point and two point perspective view</b>	<b>8M</b>										
	<p><b>Perspective view:</b>          Perspective view is a view of a three-dimensional image that portrays height, width, and depth for a more realistic image or graphic.</p> <p><b>Picture plane:</b>          Picture plane is an imaginary vertical transparent plane between observer and object on which the perspective is projected.</p> <p><b>Station point:</b>          Station point is the position at which the observer's eye is located.</p> <p><b>True height:</b>          True height is the height of object when it coincides the picture plane.</p> <p><b>Difference between One point perspective and Two point perspective</b></p> <table border="1" data-bbox="272 1512 1310 1816"> <thead> <tr> <th data-bbox="272 1512 791 1552"><b>One point perspective</b></th> <th data-bbox="791 1512 1310 1552"><b>Two point perspective</b></th> </tr> </thead> <tbody> <tr> <td data-bbox="272 1552 791 1626">One point perspective has one vanishing point.</td> <td data-bbox="791 1552 1310 1626">Two point perspective has two vanishing points on the horizon.</td> </tr> <tr> <td data-bbox="272 1626 791 1666">Generally used for road views</td> <td data-bbox="791 1626 1310 1666">Generally used for building views</td> </tr> <tr> <td data-bbox="272 1666 791 1740">There is one set of inclined line in perspective view</td> <td data-bbox="791 1666 1310 1740">There are two sets of inclined lines in perspective view</td> </tr> <tr> <td data-bbox="272 1740 791 1816">In perspective view lines are vertical, horizontal and inclined</td> <td data-bbox="791 1740 1310 1816">In perspective view lines are vertical and inclined</td> </tr> </tbody> </table>	<b>One point perspective</b>	<b>Two point perspective</b>	One point perspective has one vanishing point.	Two point perspective has two vanishing points on the horizon.	Generally used for road views	Generally used for building views	There is one set of inclined line in perspective view	There are two sets of inclined lines in perspective view	In perspective view lines are vertical, horizontal and inclined	In perspective view lines are vertical and inclined	<p><b>For each definition 01 mark</b></p> <p><b>for each correct point of difference 01 mark with max. of 04 marks</b></p>
<b>One point perspective</b>	<b>Two point perspective</b>											
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<b>Q.4</b>	<b>Answer any TWO of the following:</b>	<b>16 M</b>
a)	<b>Explain with examples principle of sanitation with cleanliness, ventilation and light.</b>	<b>08 M</b>
	<p><b>Sanitation:</b> It includes light, cleanliness, ventilation, WC, urinals and bath etc. There must be proper arrangement of all these units in every structure according to it's utility and requirement.</p> <p><b>(i) Sanitary accommodations:</b> All sanitary conveniences (WC, bath room and urinals) must be provided with dado on walls, so that they can be maintained clean. Flooring and walls in such units must be water proofed. To maintain cleanliness, effective water carriage system is adopted for disposal of waste (urine, soap water, night soil etc). While planning all these units, provision for water supply, drainage, rain water disposal should be made.</p> <p><b>(ii) Cleanliness:</b> All units of buildings must be clean and minimum dust should be accumulated. While planning, moulding, corners, cornice, sills should be given a special attention as they are places of dust accumulation. Dust is injurious to health and may cause many diseases. Skirting should be provided for rooms.</p> <p><b>(iii) Ventilation:</b> It is related with a system of supply or removing air by natural or mechanical means. The object of ventilation is to provide and maintain comfortable conditions inside the building.</p> <p>Proper location and number of windows provide good ventilation. Natural ventilation is achieved by providing windows and doors face opposite to each other in opposite walls. Artificial ventilation can be achieved by providing exhaust system in kitchen and supply system (Air conditioning) for rooms.</p> <p><b>(iv) Light:</b> This is important from the point of view of illumination of rooms and hygienic condition. Natural and artificial lighting is used for this purpose.</p> <p>Natural lighting is achieved by proper orientation of building and by providing sufficient number of windows in every room and units of a building. The light gives illumination and destroys germs. Artificial lighting is required to replace natural illumination or to increase it. This is more important in case of offices, schools, industries, hospitals, hotels etc. A care should be taken that artificial light should be free from glare, and should come from correct direction.</p>	<b>02 M for Each point</b>
b)	<p><b>Draw a detailed plan and section for a RCC footing from following data for stepped footing.</b></p> <p><b>(i) Size of column 230 x 300 mm</b>  <b>(ii) First step – 1000 x 1200 mm</b>  <b>(iii) Second step – 800 x 1000 mm</b>  <b>(iv) Depth of each footing – 250 mm</b>  <b>(v) Depth of foundation – 1200 mm</b>  <b>(vi) Assume suitable data and mention it clearly.</b></p>	<b>08 M</b>

08\*M

**Note-**

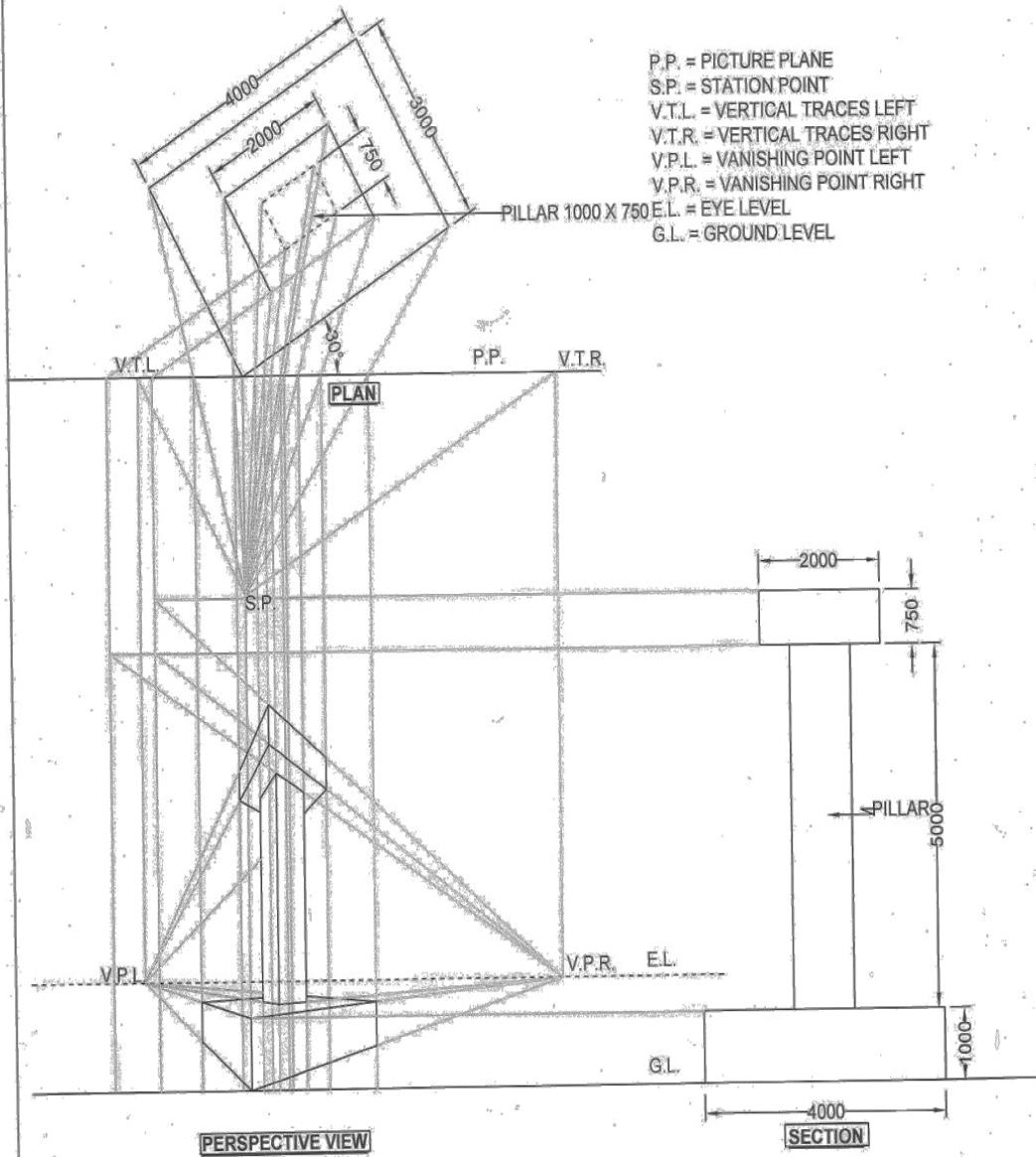
\*( Scale - 1 Mark,

Plan showing dimensions- 3 Marks

Section showing reinforcement details and dimensions- 4 Marks.)

c)	<b>Prepare schedule of opening for question No.2 building.</b>					<b>8M</b>																																																
	<table border="1"> <thead> <tr> <th data-bbox="236 257 309 369">Sr. No.</th> <th data-bbox="309 257 442 369">Item</th> <th data-bbox="442 257 569 369">Symbol</th> <th data-bbox="569 257 651 369">No.</th> <th data-bbox="651 257 879 369">Size (mm)</th> <th data-bbox="879 257 1326 369">Description</th> </tr> </thead> <tbody> <tr> <td data-bbox="236 369 309 443">1</td> <td data-bbox="309 369 442 443">Door</td> <td data-bbox="442 369 569 443">D</td> <td data-bbox="569 369 651 443">01</td> <td data-bbox="651 369 879 443">1000 x 2100</td> <td data-bbox="879 369 1326 443">Paneled Door with T.W.</td> </tr> <tr> <td data-bbox="236 443 309 555">2</td> <td data-bbox="309 443 442 555">Door</td> <td data-bbox="442 443 569 555">D1</td> <td data-bbox="569 443 651 555">03</td> <td data-bbox="651 443 879 555">900 x 2100</td> <td data-bbox="879 443 1326 555">Fully paneled in T.W. single shutter</td> </tr> <tr> <td data-bbox="236 555 309 734">3</td> <td data-bbox="309 555 442 734">Door</td> <td data-bbox="442 555 569 734">D2</td> <td data-bbox="569 555 651 734">02</td> <td data-bbox="651 555 879 734">750 x 2100</td> <td data-bbox="879 555 1326 734">Fully Paneled and partly glazed door single shutter</td> </tr> <tr> <td data-bbox="236 734 309 801">4</td> <td data-bbox="309 734 442 801">Window</td> <td data-bbox="442 734 569 801">W</td> <td data-bbox="569 734 651 801">02</td> <td data-bbox="651 734 879 801">1500 x 1200</td> <td data-bbox="879 734 1326 801">Fully glazed window</td> </tr> <tr> <td data-bbox="236 801 309 875">5</td> <td data-bbox="309 801 442 875">Window</td> <td data-bbox="442 801 569 875">W1</td> <td data-bbox="569 801 651 875">04</td> <td data-bbox="651 801 879 875">1000 x 1200</td> <td data-bbox="879 801 1326 875">Fully glazed window</td> </tr> <tr> <td data-bbox="236 875 309 987">6</td> <td data-bbox="309 875 442 987">Kitchen Window</td> <td data-bbox="442 875 569 987">W2</td> <td data-bbox="569 875 651 987">02</td> <td data-bbox="651 875 879 987">1200 x 1200</td> <td data-bbox="879 875 1326 987">Fully glazed window</td> </tr> <tr> <td data-bbox="236 987 309 1099">7</td> <td data-bbox="309 987 442 1099">Ventilator</td> <td data-bbox="442 987 569 1099">V</td> <td data-bbox="569 987 651 1099">02</td> <td data-bbox="651 987 879 1099">450 x 600</td> <td data-bbox="879 987 1326 1099">Pivoted at Centre horizontally</td> </tr> </tbody> </table> <p data-bbox="236 1099 1326 1144"><b>(Note:- Student can assume their own data accordingly give credit to them)</b></p>					Sr. No.	Item	Symbol	No.	Size (mm)	Description	1	Door	D	01	1000 x 2100	Paneled Door with T.W.	2	Door	D1	03	900 x 2100	Fully paneled in T.W. single shutter	3	Door	D2	02	750 x 2100	Fully Paneled and partly glazed door single shutter	4	Window	W	02	1500 x 1200	Fully glazed window	5	Window	W1	04	1000 x 1200	Fully glazed window	6	Kitchen Window	W2	02	1200 x 1200	Fully glazed window	7	Ventilator	V	02	450 x 600	Pivoted at Centre horizontally	<b>08*M</b>
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<b>Q.5.</b>	<p data-bbox="236 1592 1326 1715"><b>Figure No. 2 shows a pedestal and draw perspective drawing of it. Assume eye level at 1.5 m above ground level. The station point is 3 m from picture plane.</b></p> <p data-bbox="236 1760 560 1805"><b>Ans – On Next page</b></p>					<b>12M</b>																																																

**QUE. NO. 5**  
**PERSPECTIVE DRAWING OF A PEDESTAL.**



Marking of VTL, VTR, VPL, VPR, SP, EL, GL = 04 marks  
 Projection lines = 03 marks  
 Perspective view with proper scale = 05 marks