MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION
(Autonomous)

(ISO/IEC -270001 – 2005 certified)

SUMMER -2019 EXAMINATION
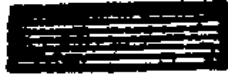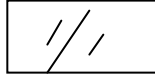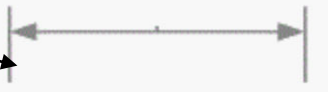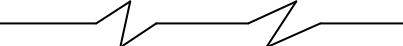
Subject code: 17309   **Model Answer**   Page No: 01/ 11
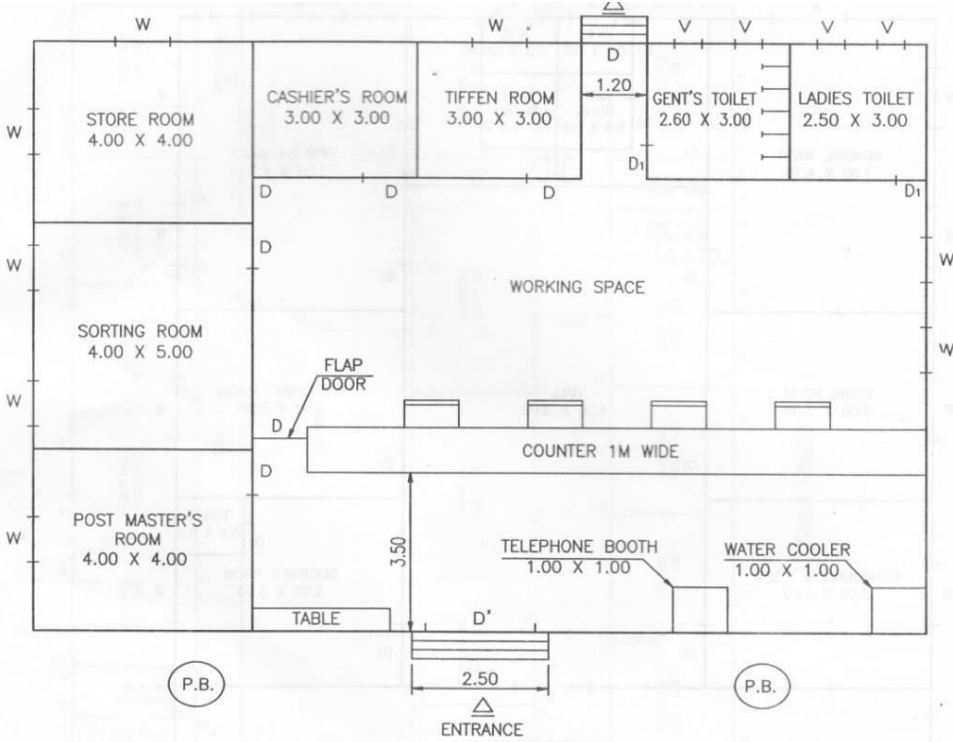
Important Instructions to examiners:

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 stepwise 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

Q.No.	Question and Model Answers	Marks
Q.1 (a)	**Answer any THREE:**	**12**
(i)	**Draw Graphical Symbols for:** **(a) Stone work, (b) Glass, (c) Ground level, (d) Wood work**	
	Ans: Graphical Symbols for- **(a) Stone work** **(b) Glass** **(c) Ground level** **(d) Wood work** *(Note- 01 mark each)*	**04***
(ii)	**Draw any four types of lines used in drawing:**	
	Ans: Types of lines used in building drawing are - **(a) Centre Line**	**04***

	(b) Section Line		

(b) Section Line

(c) Hidden Line

(d) Extension Line

(e) Short Break Line

(f) Long Break line

(g) Visible Outline   Thin

Thick

(h) Dimension line

(Note- 01 mark each for any four)

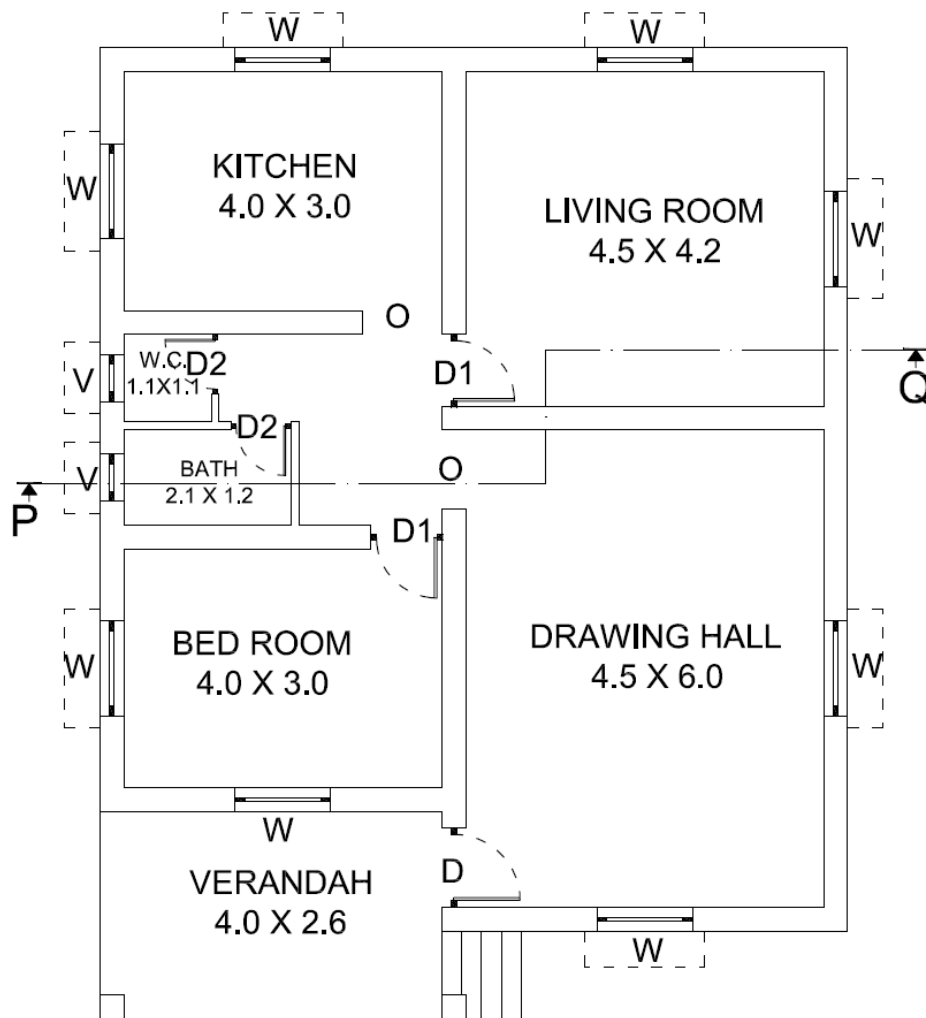|			
(iii)	**Define :** **(1) Grouping, (2) Orientation**		
	Ans: **(a) Grouping:** It is an arrangement of various rooms with reference to their functions or in other words, making group of units depending upon their functional co-relations. Proper grouping leads to unnecessary movements, proper co-relation, easy control and overall economy. e.g. 1) Living room should be next to verandah, 2) Kitchen and dining must be close to each other, 3) Sanitary arrangements must be adjacent to bed rooms. **(b) Orientation:** Orientation is the method of proper placement of planned unit of the building in relation to natural elements like sun, rain, wind, topography, etc. The position of building is decided with respect to North to place the different units of room to achieve natural ventilation, air circulation and lighting. Orientation is necessary to achieve maximum advantage from natural elements.	**02** **02**
(iv)	**State minimum dimensions / heights for:** **(a) Head room, (b) Dado for W.C., (c) Bath Room, (d) Kitchen**		
	Ans: **(a) Head Room:** 2.2 m **(b) Dado for W.C.:** 0.9 m to 1.0 m **(c) Bath Room:** 1.80 m^2 (width 1.20 m) OR 1.2 x 2.1 m OR 1.5 x 1.2 m **(d) Kitchen:** With store – 5.50 m^2 (width 1.80 m) OR Without store – 4.50 m^2 OR With dining – 9.50 m^2 (width 2.40 m) *(Note- 01 mark each for any one correct dimension)*	**04***

Q.1 (b)	Draw to a Line Plan to scale 1:50 for a proposed single storied post office building.	08
	Post office *(Note- for neat and suitable line plan with scale 04 marks, for door and window position -02 marks and 02marks for labeling)* **Important Note: Student may draw any other line plan of Post Office Building. So give credit accordingly.**	08*
Q.2	Figure 1 shows a line plan of a residential building. Draw to a Scale of 1:50, the following views: (i) **Developed Plan** (ii) **Front Elevation** (iii) **Section Along P-Q** Use following construction notes: (a) Depth of foundation 1.5 m below G.L., (b) Plinth height above G.L. 0.75 m, (c) Floor to Slab bottom height of all rooms is 3.1 m and that for W.C. bath and Verandah is 2.4 m, (d) Wall thickness in super structure is 300 mm, for WC, bath 100 mm. (e) Slab thickness 120 mm, (f) Chajja Projection 450 mm and 75 mm thick, (g) Assume suitable position for windows, (h) Assume suitable any other data, if required.	12 08 08
	Important Note: **Student may draw Plan, elevation and section by using other suitable scale than 1:50. So give credit accordingly.**	
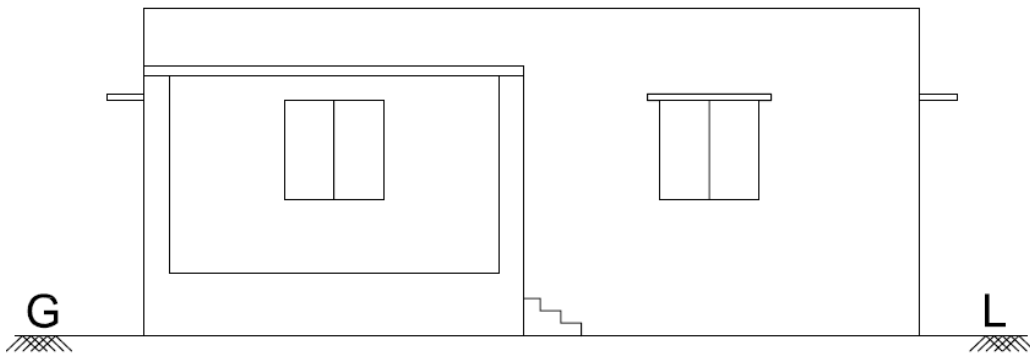
Section PQ

(Note- for Correct Section - 04 marks, All Dimensions and labeling - 02 marks, Material Symbols – 02 Marks,)

08*

Q.3	Answer any THREE of the following:	24
(a)	Draw to a suitable scale foundation plan for a building shown in Fig. No. 1 Q. No. 2. Footing size 1200 x 1200 mm and column size 300 x 300 mm.	08
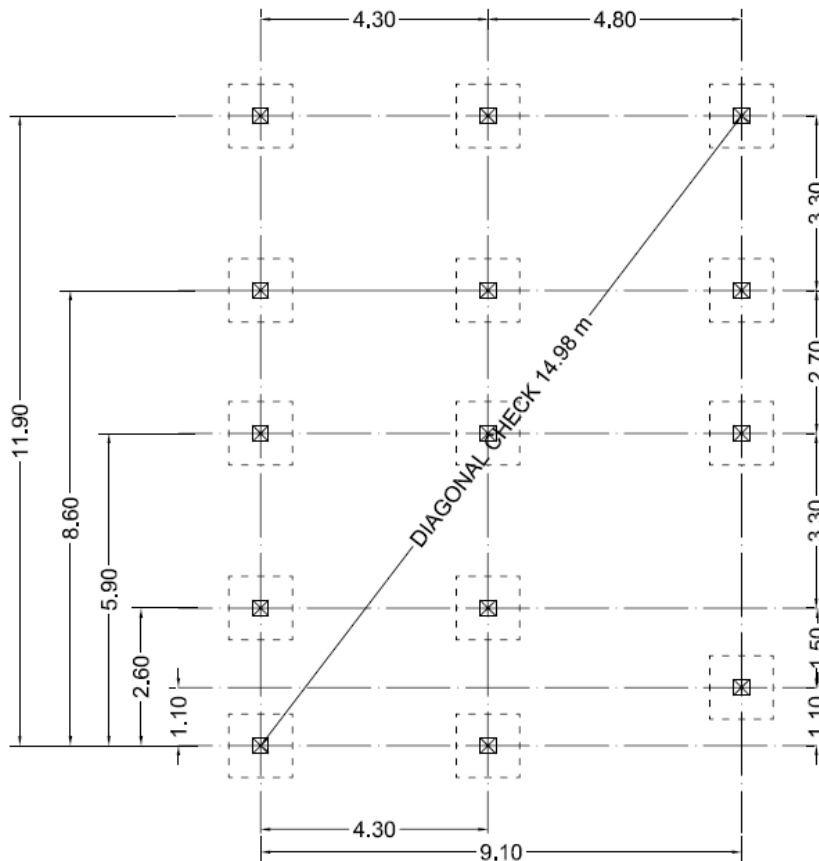
Foundation Plan
(Note- for Correct Centre lines- 02 marks, foundation width- 02 marks, , All Dimensions and labeling - 02 marks, Diagonal Check – 02 Marks,)

08*

(b)	Write schedule of Opening for building shown in figure No.:1, Q. No.2.	08

	Ans:	
	Schedule of Openings:	**08***

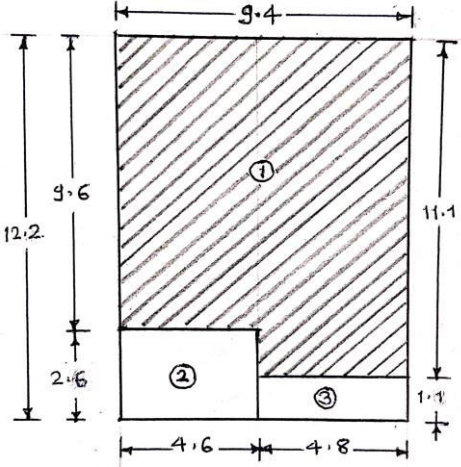| Sr.No.	Symbol	Description	Size in m	Nos.
1	D	T.W. Panelled door or Decorative type door	1.0 x 2.1	1
2	D1	Flush door	0.9 x 2.1	2
3	D2	Flush door or PVC door	0.75 x 2.1 or 0.8 x 1.8	2
4	O	Opening	1.0 x 2.1	2
5	W	Alluminium Sliding Window or T.W. Panelled window	1.2 x 1.2	8
6	V	Louvered window	0.6 x 0.6	2

*(Note- for Correct Symbols - 01 mark, Opening type - 03 marks, Opening sizes - 03 marks, No. of openings – 01 Mark)

Important Note: Student may take another type of door or window, with different sizes, give credits accordingly.

(c)	Define built up area and carpet area. Calculate built up area and carpet area of the building shown in Fig. No. 1 Q. No. 2.	08

	Ans:	
	1) Built up area: It is the area covered by all floors of the building. It covers everything under roof but excludes balconies, staircases etc. It includes floor area of all rooms plus wall thickness.	**02**
	2) Carpet Area: This is the floor area of the usable rooms at any floor OR the area where carpet can be laid.	**02**
	Area Calculations: BLOCK DIAGRAM (ALL DIMENSIONS IN M)	

	1) **Built Up Area** = Area of Block1 – Area of Block2 – Area of Block3
	    = (9.4 x 12.2) – (4.6 x 2.6) – (4.8 x 1.1)
	    = 97.44 Sq.M
			02*

	2) **Carpet Area** = (4.5 x 4.2) + (4.5 x 6) + (4 x 3)
	    = 57.9 Sq.M
	
	    (Note- 01 mark for formula and 01 mark for correct answer.
	    Block diagram is optional, if drawn by student, give credit accordingly.)
			02*

(d)	State various units required for primary health centre.		**08**
	Ans: Units required for <u>Primary health centre</u>: a) Entrance or reception - 2.5 m wide b) Doctor's Room – 3 m x 3.6 m c) Examination Room – 3 m x 4 m d) Operation Theatre – 4 m x 5.5 m e) Circulation Space – 3 m wide f) Laboratory – 15 sq. m g) Ward (general/ maternity) – area 8 to 10 sq. m per bed h) Medical Store or Pharmacy – 3 x 4.5 m i) Office – 12 sq. m j) Family Planning Unit – 3 m x 4 m k) Parking - Scooter/ Motorcycle – 3 sq.m./ vehicle, Cycle- 1.2 sq.m./ cycle l) Sanitary block		**08***

Unit	Male	Female
W.C.	1 in 100	1 in 50
Urinal	1 in 50	---
Wash basin	1 in 100	1 in 100
Bath	2 per ward	2 per ward

(Note- 1 mark each for any 08 units. Sizes are optional.)

(e)	**Explain aspect and prospect.**		
	Ans: **Aspect-** 1) Aspect is the art of positioning of rooms and openings to get maximum benefits from natural sources like Sun, wind, rain, scenery, etc. 2) Also it involves protection from ill effects of natural sources. 3) By proper positioning of doors and windows in external walls, benefits of natural elements can be obtained. It also creates pleasant, hygienic and cheerful atmosphere inside the room. 4) For example: i) Kitchen is placed to the East direction as morning sun rays kill bacteria and germs, ii) Bedroom is provided towards West or South-West, as in summer there is plentiful of breeze and evening sun removes dampness, iii) Study or dining to the North side to get only diffused light throughout the day and no heat, iv) Living room shall be placed in South or South-East direction to get heat in winter and minimum heat in summer. *(Note- 2 marks for any two examples)*		**01** **01** **02***

	Prospect- 1) Prospect means taking advantage of desirable views available from windows, doors, balconies, terraces of features outside the building such as garden, lake, sea, river, hill, etc.	**01**
	2) It also includes blocking undesirable views such as slum area, gutters, garbage dump, railway track, etc. by providing blank walls.	**01**
	3) Therefore by proper positioning of doors and windows in external walls, prospect can be achieved. 4) For example: i) If there is lake towards east side we can provide balconies, terraces and windows towards that direction and ii) if there is slum area towards west direction we can provide a blank wall towards that direction.	**02**
	Important Note – If student has drawn figure to explain the principle, give credit accordingly. **i.e. 01 for definition, 02 for figure and 01 for example.**	
Q.4	**Answer any TWO:**	**16**
(a)	**Draw a plan and section of a Dog legged R.C.C. stair case from following data: i) Number of risers- 10 of 150 mm height in one flight. ii) Trades – 275 mm width, iii) Width of stair case is 1200 mm. iv) Width of landing – 1200 mm. v) Waist slab 130 mm thick. Assume all suitable data if required.**	**08**
	 (Note- Distribution of 04 marks is as below - 02marks for arrangement, 01 mark for dimensions, 01mark for neatness)	**04*** **04***

(b)	Explain with example the aspect and prospect. State your comments on aspect of a residential building shown in Fig. No. 1 Q. No. 2.	08
	Ans:	
	Aspect- 1) Aspect is the art of positioning of rooms and openings to get maximum benefits from natural sources like Sun, wind, rain, scenery, etc. 2) Also it involves protection from ill effects of natural sources. 3) For example: i) Kitchen is placed to the East direction as morning sun rays kill bacteria and germs, ii) Bedroom is provided towards West or South-West, as in summer there is plentiful of breeze and evening sun removes dampness, iii) Study or dining to the North side to get only diffused light throughout the day and no heat, iv) Living room shall be placed in South or South-East direction to get heat in winter and minimum heat in summer.	**01** **02**
	Prospect- 1) Prospect means taking advantage of desirable views available from windows, doors, balconies, terraces of features outside the building such as garden, lake, sea, river, hill, etc. 2) It also includes blocking undesirable views such as slum area, gutters, garbage dump, railway track, etc. by providing blank walls. 3) For example: i) If there is lake towards east side we can provide balconies, terraces and windows towards that direction and ii) if there is slum area towards west direction we can provide a blank wall towards that direction.	**01** **02**
	Comment regarding Aspect for building in Fig.1 Q.No.2 – Any related comment as per aspect.	**02**
	<u>Important Note- As North direction is not given in the Fig. No.1 Q.No.2, give credit to student for related comment.)</u>	
(c)	Describe the principles used in perspective drawing. What do you mean by vanishing point and eye level in perspective drawing? What is the difference between one point perspective and two point perspective.	08
	Ans: **Principles used in Perspective Drawing:** 1) The lines appear to be shorter than their actual length and this effect increases as the distance of the object increase. 2) The picture of all points and lines on the Picture plane coincides with the points and lines themselves. 3) Perspective of all parallel lines which are not parallel to the picture plane, converge to a point i.e. at vanishing point. 4) Perspective of all parallel lines which are also parallel to the picture plan are themselves parallel. 5) Perspectives of horizontal lines which are parallel to the picture plane are horizontal except those at eye level do not appear horizontal. 6) Perspective of all parallel lines, which are not parallel to the picture plane converge to a point (Vanishing Point). 7) Perspective of parallel lines which are parallel to the vertical plane converge to a vanishing point on the vertical line. 8) Perspective of horizontal line appear to vanish on the horizontal line or converge to a vanishing point on the horizontal line.	**04** **(for any four points)**

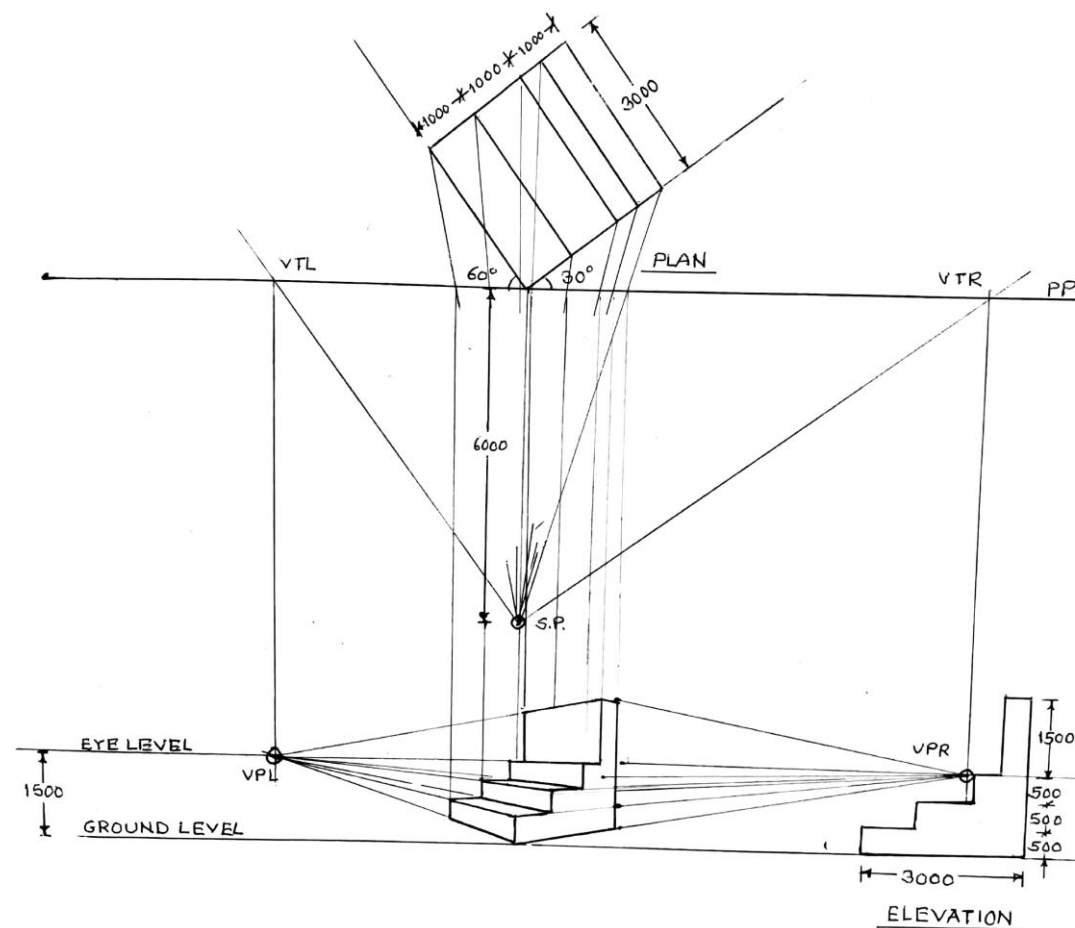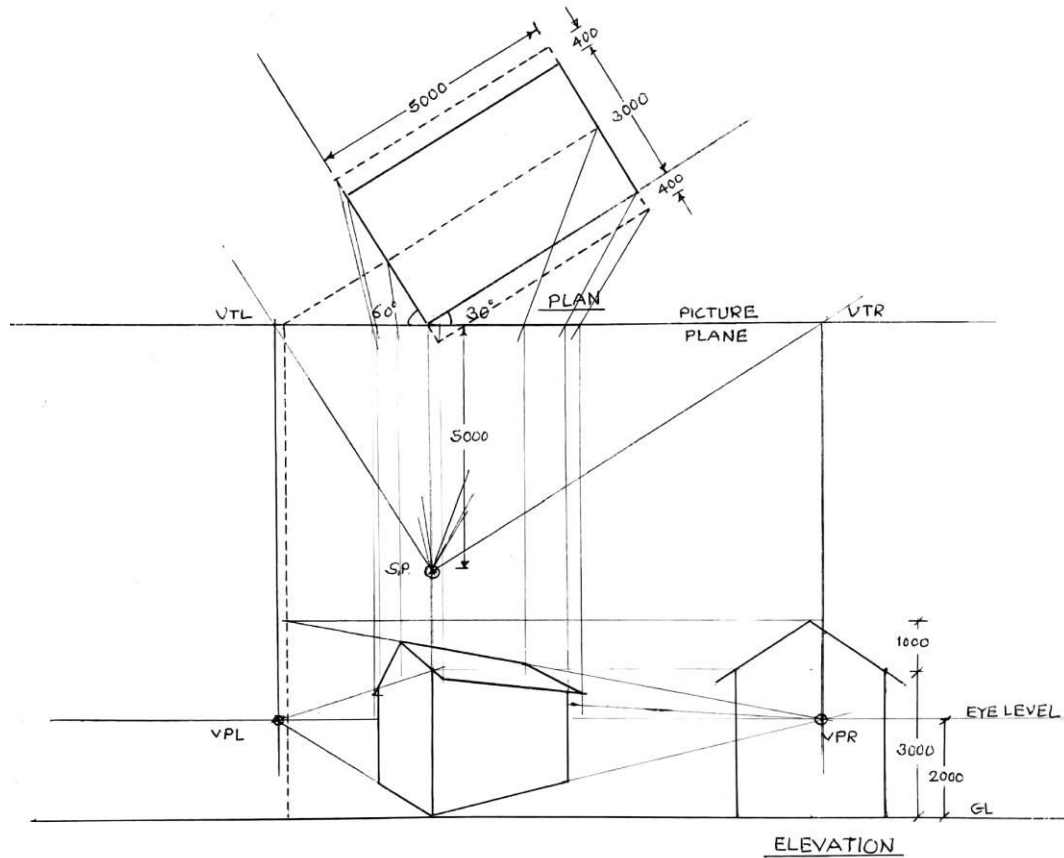|		

	Vanishing point:-
	The vanishing point on a line is the point where the perspective of all straight lines except those parallel to the picture plane appears to terminate. OR
	The point, where two parallel lines appear to meet is called Vanishing Point.
	
	Eye level:-
	Eye level is the height of the eye of the observer at a station point from where he observes the object.
	
	Difference between One point Perspective and Two point Perspective :
	  1) In one point Perspective the two sides of an object are parallel to the picture plane and the remaining sides are perpendicular to the picture plane. It has only one vanishing point.
	  2) In two point Perspective the two sides of an object are inclined to the picture plane, for two sets of horizontal lines. It has two vanishing points.
		01
		
		01
		
		02

Q.5 (a)	**Draw to a suitable scale a two point perspective drawing for pedestal shown in Fig. 2. Assume eye level at 1.5 m above G.L.**	**12**
		12*
	*(Note- For drawing neatly picture plane-01 mark, plan-01 mark, elevation-01 mark, two vanishing points-01 mark, construction lines-01 mark, true heights-01 mark, correct four steps-06 marks, =total 12)	

		OR	
Q.5		Draw to a suitable scale two point perspective assuming eye level 2.0 m for a drawing shown in Fig. No. 3.	**12**
		(Note- For drawing neatly picture plane-01 mark, plan-01 mark, elevation-01 mark, two vanishing points-01 mark, construction lines-01 mark, true heights-01 mark, base or body of object-03 marks, top of object-03 marks=total 12)	**12***