**SRM Institute of Science and Technology**
**College of Engineering and Technology**
**Department of Mechanical Engineering**

## 18MES101L – Engineering Graphics and Design

| | | | |
|---|---|---|---|
| Reg. No | | Ex. No. | 4 |
| Name of the student | | Title of the exercise | Orthographic multi-view projections (Orthographic projections of straight lines and planes inclined to both the planes) |
| Department / Branch | | Semester | 2 |
| Section | | Date of Exercise | |

**Note:**

- **4 Questions each answer 2 marks (4 x 2= 8 Marks)**
- **Record 2 Marks**
- **'X' denotes last two digits of your Reg.No.**

**i. Projection of lines inclined to both the planes (without traces)**

1. A line AB, of length 70 mm long, is inclined at 45$^o$ to HP and 30$^o$ to VP. Its end A is X mm (Where X is the last two digits of register number) above HP and 25 mm in front of VP. Draw its projections. *(CO-1/ level 3/ 2 marks)*

2. A line RS, 80 mm long has its end R, 20 mm above HP and X mm in front of VP (Where X is the last two digits of register number). The top and front views of the line measures 50 mm and 65 mm respectively. Draw the projection of the line and find its true inclinations with VP and HP. *(CO-1/ level 3/ 2 marks)*

**ii. Projection of planes (without traces)**

3. A regular pentagon ABCDE of side X mm (Where X is the last two digits of register number) has its side BC on floor. Its plane is 45° to the floor and perpendicular to wall. Draw the projections of the pentagon. *(CO-1/ level 3/ 2 marks)*

4. A regular hexagon ABCDEF of side X mm (Where X is the last two digits of register number) has its side DE on wall. Its plane is perpendicular to floor and inclined 35$^o$ to wall. Draw its projections. *(CO-1/ level 3/ 2 marks)*

## Extra problems for practice

**1.** A line CD 80 mm long has its end C 30 mm above HP and 20 mm infront of VP. The line is inclined at 45° to HP and 35° to VP. Draw its projections.

**2.** One end P of line PQ, 80mm long is 10mm above HP and 15mm in front of VP. The line is inclined at $40^o$ to the HP and the top view makes $50^o$ with VP. Draw the projections of the line and find its true inclinations with VP.

**3.** A rectangular plane ABCD, of side AB, 70 mm and BC, 30 mm, has its side BC on the H.P. (floor). The plane is inclined 60° to the H.P (floor) and resting side BC is inclined at 45° to the V.P. (wall). Draw the projections of the rectangular plane.

**4.** Find the shortest distance between a pencil (line AB) and a sharpener (point C) placed on a table, whose Cartesian coordinates are A = (10,20,30); B = (30,40,60), and C = (60,20,40).

**Rubrics: Exercise 4**

| **Name of the faculty grading:** | **Date of submission:** | **Date of grading:** |
|---|---|---|
| **Signature of the faculty grading:** | **Grade (out of 10):** | |

| **Criteria** | **No errors** | **Minor errors (1-2 errors)** | **Major errors (3-4 errors)** | **Incomplete (5-6 errors)** | **Resubmission required (more than 7 errors)** |
|---|---|---|---|---|---|
| Orientation (Proper scaling to fit the drawing and maintain the required views) | 4 | 3 | 2 | 1 | 0 |
| Dimensions/Legibility (proper dimensioning, show all the required dimensions with legibility) | 4 | 3 | 2 | 1 | 0 |
| Record writing | 2 | 1.5 | 1 | 0.5 | 0 |
| **Total marks** | **10** | | | | |

**Note:** Students must show the dimension which has a register number without fail; otherwise marks of that question will be awarded as zero.