Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

Hingna Road, Wanadongri, Nagpur - 441 110

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Ph.: 07104-237919, 234623, 329249, 329250 Fax: 07104-232376, Website: www.ycce.edu

Department of Computer Technology

Vision of the Department

To be a well-known centre for pursuing computer education through innovative pedagogy, value-based education and industry collaboration. **Mission of the Department**

To establish learning ambience for ushering in computer engineering professionals in core and multidisciplinary area by developing Problem-solving skills through emerging technologies.

Session 2025-2026

Vision: Dream of where you want.	**Mission:** Means to achieve Vision

Program Educational Objectives of the program (PEO): (broad statements that describe the professional and career accomplishments)

PEO1	**Preparation**	**P: Preparation**	**Pep-CL abbreviation pronounce as Pep-si-lL easy to recall**
PEO2	**Core Competence**	**E: Environment (Learning Environment)**	
PEO3	**Breadth**	**P: Professionalism**	
PEO4	**Professionalism**	**C: Core Competence**	
PEO5	**Learning Environment**	**L: Breadth (Learning in diverse areas)**	

Program Outcomes (PO): (statements that describe what a student should be able to do and know by the end of a program)

Keywords of POs:

Engineering knowledge, Problem analysis, Design/development of solutions, Conduct Investigations of Complex Problems, Engineering Tool Usage, The Engineer and The World, Ethics, Individual and Collaborative Team work, Communication, Project Management and Finance, Life-Long Learning

PSO Keywords: Cutting edge technologies, Research

"I am an engineer, and I know how to apply engineering knowledge to investigate, analyse and design solutions to complex problems using tools for entire world following all ethics in a collaborative way with proper management skills throughout my life." *to contribute to the development of cutting-edge technologies and Research*.

Integrity: I will adhere to the Laboratory Code of Conduct and ethics in its entirety.

Name and Signature of Student and Date

(Signature and Date in Handwritten)

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Session	2025-26 (ODD)	Course Name	**PE-I - Geo-Intelligence for Smart IoT Devices Lab**
Semester	5	**Course Code**	23IOT1523
Roll No	37	**Name of Student**	**Dhanashri Raut**

Practical Number	**04**
Course Outcome	Apply and demonstrate the use of proprietary and open-source GIS tools (e.g., QGIS) for creating, visualizing, and managing spatial datasets.
Aim	Produce a publication-quality map from vector layers, using Data View and Layout view.
Problem Definition	The task involves producing a publication-quality map from vector layers by using QGIS's Data View and Layout View to include appropriate cartographic elements such as legends, scale bars, and labels.

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Theory (100 words)	**1. Introduction**
	
	Cartography is the art and science of making maps. In GIS, producing a publication-quality map means transforming raw spatial data into a clear, informative, and visually appealing representation. QGIS, as an open-source GIS platform, provides tools to design maps using **Data View** (for spatial data handling) and **Layout View** (for map composition).
	
	2. Data View in QGIS
	
	• The **Data View (Map Canvas)** is where vector and raster layers are added, visualized, and symbolized.
	
	• Here, users can:
	
	    ○ Load vector layers (points, lines, polygons).
	
	    ○ Apply symbology, styles, and labeling.
	
	    ○ Perform attribute-based visualization.
	
	• This stage ensures that spatial data is prepared and styled before final map creation.
	
	3. Layout View in QGIS
	
	• The **Layout View (Print Layout)** is used to compose the final map for presentation or publication.
	
	• Essential cartographic elements added here include:
	
	    ○ **Map Frame:** The actual spatial data view.
	
	    ○ **Legend:** Explains map symbols and colors.
	
	    ○ **Scale Bar:** Provides reference for distances.
	
	    ○ **North Arrow:** Shows orientation.
	
	    ○ **Title and Labels:** Enhance clarity and context.
	
	    ○ **Graticules/Grids:** Optional for geographic reference.
	
	.

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4. Cartographic Principles

To achieve a professional-quality map, cartographers follow principles such as:

- **Clarity:** Avoid overcrowding; symbols and labels must be legible.
- **Balance:** Proper arrangement of map elements to create harmony.
- **Relevance:** Include only essential details.
- **Accuracy:** Ensure correct CRS, scale, and symbology.

5. Exporting the Map

- Once the map is composed, QGIS allows exporting in multiple formats: PDF, PNG, JPEG, or TIFF.
- These outputs are suitable for reports, research publications, or digital presentations

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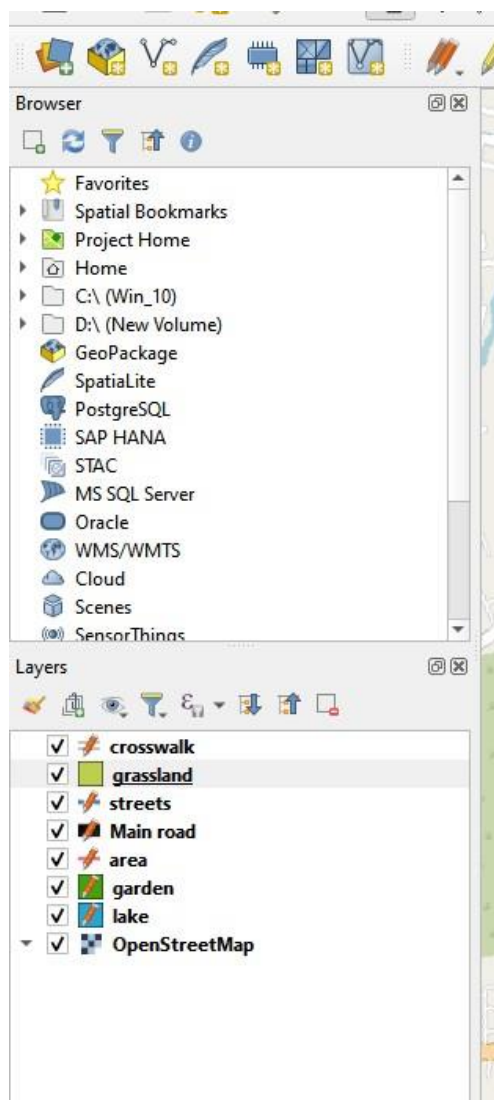Ph.: 07104-237919, 234623, 329249, 329250 Fax: 07104-232376, Website: www.ycce.edu

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Procedure and Execution (100 Words)	Implementation Steps: 1. **Load Vector Layers in Data View** o Open QGIS and add the required shapefiles (e.g., administrative boundaries, roads, rivers). o Apply symbology and labeling to make the data visually clear. 2. **Switch to Layout View** o Go to **Project → New Print Layout**. o Assign a name to the layout and open the Layout Window. 3. **Insert Map Frame** o Use the **Add Map** tool to draw the main map frame on the layout canvas. o Adjust the extent and scale as required. 4. **Add Cartographic Elements** o Insert **Legend**, **Scale Bar**, **North Arrow**, and **Title**. o Customize fonts, colors, and positioning for clarity. 5. **Finalize and Export** o Check balance and readability of all elements. o Export the map as **PDF, PNG, or JPEG** for publication or reports.

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Stepwise Screenshots with steps:

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Output Analysis	The required vector layers were successfully loaded into QGIS and styled in the Data View with appropriate symbology and labeling. A new Print Layout was created, where the map frame was inserted and enhanced with essential cartographic elements including a **legend, scale bar, north arrow, and title**. The elements were arranged in a balanced manner, ensuring clarity and readability.
Link of student Github profile	**https://github.com/24030192-lab/PE-**

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where lab assignment has been uploaded	
Conclusion	Creating a publication-quality map in QGIS involves preparing spatial data in **Data View** and then arranging cartographic elements in **Layout View**. By combining legends, scale bars, north arrows, labels, and proper symbology, a clear and professional map can be produced. This process highlights the power of GIS in not only analyzing spatial data but also communicating results effectively.
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