

Ref No:

## SRI KRISHNA INSTITUTE OF TECHNOLOGY



## COURSE PLAN

Academic Year 2019-2020

|                      |                         |
|----------------------|-------------------------|
| Program:             | B E – CIVIL Engineering |
| Semester :           | 5                       |
| Course Code:         | 17CV561                 |
| Course Title:        | Traffic Engineering     |
| Credit / L-T-P:      | 4/ 4-0-0                |
| Total Contact Hours: | 50                      |
| Course Plan Author:  | Dhanalakshmi M          |

Academic Evaluation and Monitoring Cell

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Note : Remove "Table of Content" before including in CP Book  
 Each Course Plan shall be printed and made into a book with cover page  
 Blooms Level in all sections match with A.2, only if you plan to teach / learn at higher levels

## A. COURSE INFORMATION

### 1. Course Overview

|                      |                     |                  |                   |
|----------------------|---------------------|------------------|-------------------|
| Degree:              | B.E                 | Program:         | Civil Engineering |
| Year / Semester :    | 2018-5th            | Academic Year:   | 2018-19           |
| Course Title:        | Traffic Engineering | Course Code:     | 17CV561           |
| Credit / L-T-P:      | 4                   | Duration of SEE: | 180 Minutes       |
| Total Contact Hours: | 40                  | SEE Marks:       | 80 Marks          |
| CIA Marks:           | 20                  | Assignment       | 1 / Module        |
| Course Plan Author:  | Dhanalakshmi M      | Sign             | Dt:29/07/2019     |
| Checked By:          | Mohan K T           | Sign ..          | Dt:29/07/2019:    |
| CO Targets           | CIA Target : 65 %   | SEE Target:      | 70 %              |

**Note:** Define CIA and SEE % targets based on previous performance.

### 2. Course Content

Content / Syllabus of the course as prescribed by University or designed by institute. Identify 2 concepts per module as in G.

| Module | Module Content  | Teaching Hours | Module Concepts                                    | Blooms Level |
|--------|---|----------------|--|--------------|
| 1      | Road uses characteristics,<br>Road characteristics, vehicular characteristics<br>Fundamentals of Traffic Flow, Urban Traffic problems in India<br>Integrated planning of town, country<br>regional and all urban infrastructures,Sustainable approach-<br>land use &transport and modal integration.  | 8              | Road characteristics,<br>Urban transport planning. | L3           |
| 2      | Traffic Surveys- Speed, journey time and delay surveys,<br>Vehicles Volume Survey including non-motorized transports,<br>Methods and interpretation, Origin Destination Survey, Methods<br>and presentation,Parking Survey,<br>Accident analyses-Methods, interpretation and presentation,<br>Statistical applications in traffic studies and traffic forecasting,<br>Level of service- Concept<br>applications and significance. | 8              | Vehicular traffic survey, O & D survey.            | L4           |
| 3      | Intersection Design- channelization<br>Rotary intersection<br>Signal design, Coordination of signals,<br>Grade separation<br>Traffic signs including VMS and road markings<br>Significant roles of traffic control personnel,<br>Networking pedestrian facilities & cycle tracks.<br>Networking pedestrian facilities & cycle tracks.   | 8              | Traffic safety,<br>smooth traffic flow.            | L3           |
| 4      | Traffic Safety and Environment:<br>Road accidents, Causes, effect, prevention<br>and cost, Street lighting,<br>Traffic and environment hazards<br>Air and Noise Pollution,<br>abatement measures, Promotion<br>Promotion and integration of public transportation,<br>Promotion of non-motorized transport.   | 8              | Over speed,<br>Pollution control                   | L3           |
| 5      | Area Traffic Management System<br>Traffic System Management (TSM) with IRC standards,<br>Traffic Regulatory Measures, Travel Demand Management (TDM),<br>Direct and indirect methods,<br>Congestion and parking pricing, All segregation methods-<br>Coordination among different agencies, Intelligent Transport<br>System for traffic management, enforcement and   | 8              | Regulation,<br>Education.                          | L4           |

|            |  |  |  |
|------------|--|--|--|
| education. |  |  |  |
|            |  |  |  |

### 3. Course Material

Books & other material as recommended by university (A, B) and additional resources used by course teacher (C).

1. Understanding: Concept simulation / video ; one per concept ; to understand the concepts ; 15 – 30 minutes

2. Design: Simulation and design tools used – software tools used ; Free / open source

3. Research: Recent developments on the concepts – publications in journals; conferences etc.

| Modules       | Details   | Chapters in book | Availability     |
|---------------|---|------------------|------------------|
| <b>A</b>      | <b>Text books (Title, Authors, Edition, Publisher, Year.)</b> | -                | -                |
| 1, 2, 3, 4, 5 | Kadiyali L R ,  | In Lib           | In Lib / In Dept |
| 1             | S K Khanna & CEG Justo  | In dept          | In Lib/ In dept  |
| <b>B</b>      | <b>Reference books</b>  |                  | -                |
| 1, 2          | Fred L. Mannering, Scott S Washbum                            | In dept          | In Lib           |
| 1, 2          | Garber and Hoel   | In Lib           | Not Available    |
| 3, 4, 5       | John E Tyworth  | In Lib           | In lib           |
| <b>C</b>      | <b>Concept Videos or Simulation for Understanding</b>         | -                | -                |
| C1            |   |                  |                  |
| C2            |   |                  |                  |
| C3            |   |                  |                  |
| C4            |   |                  |                  |
|               | Lab :   |                  |                  |
| <b>D</b>      | <b>Software Tools for Design</b>                              | -                | -                |
|               |   |                  |                  |
|               |   |                  |                  |
|               |   |                  |                  |
| <b>E</b>      | <b>Recent Developments for Research</b>                       | -                | -                |
|               |   |                  |                  |
|               |   |                  |                  |
|               |   |                  |                  |
| <b>F</b>      | <b>Others (Web, Video, Simulation, Notes etc.)</b>            | -                | -                |
|               |   |                  |                  |
|               |   |                  |                  |

### 4. Course Prerequisites

Refer to GL01. If prerequisites are not taught earlier, GAP in curriculum needs to be addressed. Include in Remarks and implement in B.5.

Students must have learnt the following Courses / Topics with described Content . . .

| Modules | Course Code | Course Name | Topic / Description | Sem | Remarks | Blooms Level |
|---------|-------------|-------------|---------------------|-----|---------|--------------|
|         |             |             |                     |     |         |              |
|         |             |             |                     |     |         |              |

### 5. Content for Placement, Profession, HE and GATE

The content is not included in this course, but required to meet industry & profession requirements and help students for Placement, GATE, Higher Education, Entrepreneurship, etc. Identifying Area / Content requires experts consultation in the area.

Topics included are like, a. Advanced Topics, b. Recent Developments, c. Certificate Courses, d. Course Projects, e. New Software Tools, f. GATE Topics, g. NPTEL Videos, h. Swayam videos etc.

| Modules | Topic / Description | Area | Remarks | Blooms Level |
|---------|---------------------|------|---------|--------------|
|         |                     |      |         |              |
|         |                     |      |         |              |
|         |                     |      |         |              |
|         |                     |      |         |              |
|         |                     |      |         |              |

## B. OBE PARAMETERS

### 1. Course Outcomes

Expected learning outcomes of the course, which will be mapped to POs. Identify a max of 2 Concepts per Module. Write 1 CO per Concept.

| Modules | Course Code.# | Course Outcome<br>At the end of the course, student should be able to . . .                 | Teach. Hours | Concept                      | Instr Method | Assessment Method | Blooms' Level |
|---------|---------------|---|--------------|------------------------------|--------------|-------------------|---------------|
| 1       | 17CV561.1     | Student should be able to understand vehicle characteristics.                               | 03           | Traffic characteristics      | Lecture      | IA                | L2 Understand |
| 1       | 17CV561.2     | Student should be able to understand planning of highway for rural and urban area.          | 05           | Traffic planning             | Lecture      | IA                | L2,L3         |
| 2       | 17CV561.3     | Student should be able to understand survey procedure, Traffic design speed.                | 04           | Traffic survey               | Lecture      | IA                | L2,L3         |
| 2       | 17CV561.4     | Student should be able to learn measuring of O & D data and analysis.                       | 04           | Traffic studies              | Lecture      | IA                | L2,L3,L4      |
| 3       | 17CV561.5     | Student should be able to understand accident , causes , prevention analysis                | 04           | Traffic Design               | Lecture      | IA                | L4            |
| 3       | 17CV561.6     | Student should be able to understand proper location for parking & analysis.                | 04           | Traffic Signs                | Lecture      | IA                | L2,L3         |
| 4       | 17CV561.7     | Student should be able to analyze Infrastructure for parking and analyze.                   | 04           | Traffic safety               | Lecture      | IA                | L1,L3         |
| 4       | 17CV561.8     | Student should be able to analyses proper location for signals & signs.                     | 04           | Environmental hazards        | Lecture      | IA                | L2,L3         |
| 5       | 17CV561.9     | Student should be able to design proper lighting system.                                    | 05           | Traffic management           | Lecture      | IA                | L4            |
| 5       | 17CV561.10    | Student should be able to understand proper management of traffic & travel demand analyses. | 03           | Intelligent transport system | Lecture      | IA                | L3            |
| -       | -             | <b>Total</b>  | <b>40</b>    | -                            | -            | -                 | <b>L2-L4</b>  |

### 2. Course Applications

Write 1 or 2 applications per CO.

Students should be able to employ / apply the course learnings to . . .

| Modules | Application Area<br>Compiled from Module Applications. | CO  | Level |
|---------|--|-----|-------|
| 1       | Determining the type of road at different location.    | CO1 | L2    |
| 1       | Providing Urban road systems.                          | CO2 | L3    |
| 2       | Different type of vehicles.                            | CO3 | L3    |

|   |  |      |    |
|---|--|------|----|
| 2 | Determining the speeds of vehicles for smooth flow at urban area.  | CO4  | L4 |
| 3 | To fix the design speed for different modes.                       | CO5  | L4 |
| 3 | Efficient use of land for road condition for rural and urban area. | CO6  | L3 |
| 4 | Smooth traffic flow and providing of signals to avoid conjection.  | CO7  | L3 |
| 4 | To control air and noise pollution at urban area.                  | CO8  | L3 |
| 5 | For smooth flow of traffic at urban area proper scheduling.        | CO9  | L4 |
| 5 | To avoid accident and conjection proper education for the people.  | CO10 | L3 |

### 3. Mapping And Justification

CO – PO Mapping with mapping Level along with justification for each CO-PO pair.

To attain competency required (as defined in POs) in a specified area and the knowledge & ability required to accomplish it.

| Mod<br>ules | Mapping |      | Mapping<br>Level | Justification for each CO-PO pair                                   | Lev<br>el |
|-------------|---------|------|------------------|---|-----------|
| -           | CO      | PO   | -                | 'Area': 'Competency' and 'Knowledge' for specified 'Accomplishment' | -         |
| 1           | CO1     | PO1  | 3                | Engg.Knowledge  | L2        |
| 1           | CO1     | PO6  | 2                | Relevant to Engg. Practice  | L3        |
| 1           | CO1     | PO7  | 1                | Impact on Environment   | L3        |
| 2           | CO1     | PO11 | 2                | Management principles   | L4        |
| 2           | CO1     | PO12 | 1                | Lifelong learning   | L4        |
| 3           |         |      | 1                |   | L3        |
| 3           | CO2     | PO1  | 2                | Engg. fundamentals and problems                                     | L3        |
| 4           | CO2     | PO2  | 3                | Identify and formulate  | L3        |
| 4           | CO2     | PO3  | 2                | Design system components  | L4        |
| 5           | CO2     | PO4  | 3                | Conduct investigation and valid conclusions                         | L3        |
| 5           | CO2     | PO5  | 2                | Apply appropriate techniques  | L2        |

### 4. Articulation Matrix

CO – PO Mapping with mapping level for each CO-PO pair, with course average attainment.

| Mod<br>ules | CO.#      | Course Outcomes<br>At the end of the course<br>student should be able to ...       | Program Outcomes |         |         |         |         |         |         |         |         |          |          |          | Lev<br>el |          |          |          |    |
|-------------|-----------|--|------------------|---------|---------|---------|---------|---------|---------|---------|---------|----------|----------|----------|-----------|----------|----------|----------|----|
|             |           |  | PO<br>1          | PO<br>2 | PO<br>3 | PO<br>4 | PO<br>5 | PO<br>6 | PO<br>7 | PO<br>8 | PO<br>9 | PO<br>10 | PO<br>11 | PO<br>12 |           | PS<br>O1 | PS<br>O2 | PS<br>O3 |    |
| 1           | 17CV561.1 | Student should be able to understand vehicle characteristics.                      | 2                |         |         |         | -       | -       | -       | -       | -       | -        | -        | -        | -         | -        | -        | -        | L2 |
| 1           | 17CV561.2 | Student should be able to understand planning of highway for rural and urban area. | 1                | 2       | 2       | 2       | -       | -       | -       | -       | -       | -        | -        | -        | -         | -        | -        | -        | L3 |
| 2           | 17CV561.3 | Student should be able to understand survey procedure, Traffic design speed.       | 1                | 2       |         | 2       | -       | -       | -       | -       | -       | -        | -        | -        | -         | -        | -        | -        | L3 |
| 2           | 17CV561.4 | Student should be able to learn measuring of O & D data and analysis.              | 1                | 2       | 2       | 2       | -       | -       | -       | -       | -       | -        | -        | -        | -         | -        | -        | -        | L4 |
| 3           | 17CV561.5 | Student should be able to understand accident , causes , prevention analysis       | 1                | 2       | 2       | 2       | -       | -       | -       | -       | -       | -        | -        | -        | -         | -        | -        | -        | L4 |
| 3           | 17CV561.6 | Student should be able to understand proper location for parking & analysis.       | 1                | 2       |         | 2       | -       | -       | -       | -       | -       | -        | -        | -        | -         | -        | -        | -        | L3 |
| 4           | 17CV561.7 | Student should be able to analyze Infrastructure for parking and analyze.          | 1                | 2       | 2       | 2       | -       | -       | -       | -       | -       | -        | -        | -        | -         | -        | -        | -        | L3 |
| 4           | 17CV561.8 | Student should be able to analyses proper location for signals & signs.            |                  | 2       | 2       | 2       | -       | -       | -       | -       | -       | -        | -        | -        | -         | -        | -        | -        | L3 |
| 5           | 17CV561.9 | Student should be able to  | 1                | 2       | 2       | 2       | -       | -       | -       | -       | -       | -        | -        | -        | -         | -        | -        | -        | L4 |

|   |                |   |          |          |            |            |   |   |   |   |   |   |   |   |   |   |   |              |
|---|----------------|---|----------|----------|------------|------------|---|---|---|---|---|---|---|---|---|---|---|--------------|
|   |                | design proper lighting system.  |          |          |            |            |   |   |   |   |   |   |   |   |   |   |   |              |
| 5 | 17CV561.10     | Student should be able to understand proper management of traffic & travel demand analyses. | 1        | 2        | 2          | 2          | - | - | - | - | - | - | - | - | - | - | - | L3           |
| - | <b>CS501PC</b> | <b>Average attainment (1, 2, or 3)</b>  | <b>2</b> | <b>2</b> | <b>2.3</b> | <b>2.4</b> | - | - | - | - | - | - | - | - | - | - | - | <b>L2-L4</b> |

## 5. Curricular Gap and Content

Topics & contents not covered (from A.4), but essential for the course to address POs and PSOs.

| Mod<br>ules | Gap Topic | Actions Planned | Schedule Planned | Resources Person | PO Mapping |
|-------------|-----------|-----------------|------------------|------------------|------------|
| 1           |           |                 |                  |                  |            |
| 2           |           |                 |                  |                  |            |
| 3           |           |                 |                  |                  |            |
| 4           |           |                 |                  |                  |            |
| 5           |           |                 |                  |                  |            |
|             |           |                 |                  |                  |            |
|             |           |                 |                  |                  |            |

## 6. Content Beyond Syllabus

Topics & contents required (from A.5) not addressed, but help students for Placement, GATE, Higher Education, Entrepreneurship, etc.

| Mod<br>ules | Gap Topic | Area | Actions Planned | Schedule Planned | Resources Person | PO Mapping |
|-------------|-----------|------|-----------------|------------------|------------------|------------|
| 1           |           |      |                 |                  |                  |            |
| 1           |           |      |                 |                  |                  |            |
| 2           |           |      |                 |                  |                  |            |
| 2           |           |      |                 |                  |                  |            |
| 3           |           |      |                 |                  |                  |            |
| 3           |           |      |                 |                  |                  |            |
| 4           |           |      |                 |                  |                  |            |
| 4           |           |      |                 |                  |                  |            |
| 5           |           |      |                 |                  |                  |            |
| 5           |           |      |                 |                  |                  |            |

## C. COURSE ASSESSMENT

### 1. Course Coverage

Assessment of learning outcomes for Internal and end semester evaluation. Distinct assignment for each student. 1 Assignment per chapter per student. 1 seminar per test per student.

| Mod<br>ule<br># | Title                                 | Teachi<br>ng<br>Hours | No. of question in Exam |          |          |          |              |           | CO        | Levels |
|-----------------|---------------------------------------|-----------------------|-------------------------|----------|----------|----------|--------------|-----------|-----------|--------|
|                 |                                       |                       | CIA-1                   | CIA-2    | CIA-3    | Asg      | Extra<br>Asg | SEE       |           |        |
| 1               | Traffic planning and characteristics. | 8                     | 2                       | -        | -        | 1        | 1            | 2         | CO1, CO2  | L3     |
| 2               | Traffic surveys                       | 8                     | 2                       | -        | -        | 1        | 1            | 2         | CO3, CO4  | L4     |
| 3               | Traffic design and visual aids.       | 8                     | -                       | 2        | -        | 1        | 1            | 2         | CO5, CO6  | L4     |
| 4               | Traffic safety and Environment.       | 8                     | -                       | 2        | -        | 1        | 1            | 2         | CO7, CO8  | L3     |
| 5               | Traffic management                    | 8                     | -                       | -        | 4        | 1        | 1            | 2         | CO9, CO10 | L4     |
| -               | <b>Total</b>                          | <b>40</b>             | <b>4</b>                | <b>4</b> | <b>4</b> | <b>5</b> | <b>5</b>     | <b>10</b> | -         | -      |

### 2. Continuous Internal Assessment (CIA)

Assessment of learning outcomes for Internal exams. Blooms Level in last column shall match with A.2.

| Mod<br>ules | Evaluation   | Weightage in<br>Marks | CO                 | Levels         |
|-------------|--------------|-----------------------|--------------------|----------------|
| 1, 2        | CIA Exam – 1 | 30                    | CO1, CO2, CO3, CO4 | L2, l3, l4, l2 |

|       |                                       |           |                    |                |
|-------|---------------------------------------|-----------|--------------------|----------------|
| 3, 4  | CIA Exam – 2                          | 30        | CO5, CO6, CO7, CO8 | L1, L2, L3, L4 |
| 5     | CIA Exam – 3                          | 30        | CO9, CO10          | L3, L1         |
| 1, 2  | Assignment - 1                        | 05        | CO1, CO2, CO3, CO4 | L2, L3, L4, L3 |
| 3, 4  | Assignment - 2                        | 05        | CO5, CO6, CO7, CO8 | L1, L2, L3, L1 |
| 5     | Assignment - 3                        | 05        | CO9, CO10          | L3, L4         |
| 1, 2  | Seminar - 1                           | -         | -                  | -              |
| 3, 4  | Seminar - 2                           | -         | -                  | -              |
| 5     | Seminar - 3                           | -         | -                  | -              |
| 1, 2  | Other Activities – define – Slip test |           |                    |                |
| 3, 4  | <b>Final CIA Marks</b>                | <b>40</b> | -                  | -              |
| 5     | Quiz - 3                              |           | -                  | -              |
| 1 - 5 | Other Activities – Mini Project       | -         |                    |                |
|       | <b>Final CIA Marks</b>                |           | -                  | -              |

## D1. TEACHING PLAN - 1

### Module - 1

|                 |  |            |                     |
|-----------------|--|------------|---------------------|
| Title:          | Divide and Conquer   | Appr Time: | 16 Hrs              |
| <b>a</b>        | <b>Course Outcomes</b>   | -          | <b>Blooms Level</b> |
| -               | The student should be able to:   | -          |                     |
| 1               | vehicle characteristics.   | CO1        | L2                  |
| 2               | planning of highway for rural and urban area.  | CO2        | L3                  |
| <b>b</b>        | <b>Course Schedule</b>   | -          | -                   |
| <b>Class No</b> | <b>Module Content Covered</b>  | <b>CO</b>  | <b>Level</b>        |
| 1               | Introduction, Road uses characteristics, Road characteristics, vehicular characteristics | CO1        | L2                  |
| 2               | Fundamentals of Traffic Flow   | CO1        | L2                  |
| 3               | Urban Traffic problems in India  | CO1        | L3                  |
| 4               | Integrated planning of town, country   | CO1        | L2                  |
| 5               | regional and urban infrastructures   | CO2        | L2                  |
| 6               | Sustainable approach   | CO2        | L3                  |
| 7               | land use   | CO2        | L2                  |
| 8               | transport and modal integration.   | CO2        | L2                  |
| <b>c</b>        | <b>Application Areas</b>   | <b>CO</b>  | <b>Level</b>        |
| 1               | De terming the type of road at different location.                                       | CO1        | L3                  |
| 2               | Providing Urban road systems.  | CO2        | L4                  |
| <b>d</b>        | <b>Review Questions</b>  | -          | -                   |
| 1               | Types of Highways.   | CO1        | L1                  |
| 2               | Vehicle characteristics  | CO1        | L3                  |
| 3               | Mode of vehicles, PIEV theory.   | CO2        | L2                  |
| 4               | Urban problems   | CO2        | L4                  |
| 5               | Infrastructure planning  | CO2        | L2                  |
| 6               | Land use at rural and urban areas  | CO2        | L5                  |
| <b>e</b>        | <b>Experiences</b>   | -          | -                   |
| 1               |  |            |                     |
| 2               |  |            |                     |



|   |  |  |  |
|---|--|--|--|
| 3 |  |  |  |
| 4 |  |  |  |
| 5 |  |  |  |

## Module – 2

|                 |  |            |                     |
|-----------------|--|------------|---------------------|
| Title:          | Divide and Conquer   | Appr Time: | 10 Hrs              |
| <b>a</b>        | <b>Course Outcomes</b>   | -          | <b>Blooms Level</b> |
| -               | The student should be able to:   | -          |                     |
| 1               | understand survey procedure, Traffic design speed.                     | CO3        | L4                  |
| 2               | learn measuring of O & D data and analysis.                            | CO4        | L3                  |
| <b>b</b>        | <b>Course Schedule</b>   | -          | -                   |
| <b>Class No</b> | <b>Module Content Covered</b>  | <b>CO</b>  | <b>Level</b>        |
| 17              | Traffic Surveys  | CO3        | L2                  |
| 18              | Speed, journey time and delay surveys,                                 | CO3        | L2                  |
| 19              | Vehicles Volume Survey including non-motorized transports,             | CO3        | L3                  |
| 20              | Methods and interpretation, Origin Destination Survey,                 | CO3        | L2                  |
| 21              | Methods and presentation, Parking Survey,<br>Accident analyses-Methods | CO4        | L3                  |
| 22              | interpretation and presentation  | CO4        | L2                  |
| 23              | Statistical applications in traffic studies and traffic forecasting,   | CO4        | L3                  |
| 24              | Level of service- Concept<br>applications and significance.            | CO4        | L4                  |
| <b>c</b>        | <b>Application Areas</b>   | <b>CO</b>  | <b>Level</b>        |
| 1               | Different type of vehicles.  | CO3        | L3                  |
| 2               | De terming the speeds of vehicles for smooth flow at urban area.       | CO4        | L4                  |
| <b>d</b>        | <b>Review Questions</b>  | -          | -                   |
| 7               | Types o traffic survey.  | CO3        | L1                  |
| 8               | O & D survey   | CO4        | L3                  |
| 9               | Parking survey   | CO3        | L2                  |
| 10              | Traffic volume studies   | CO4        | L4                  |
| 11              | Traffic forecasting  | CO4        | L2                  |
| 12              | Level of service   | CO3        | L5                  |
| <b>e</b>        | <b>Experiences</b>   | -          | -                   |
| 1               |  |            |                     |
| 2               |  |            |                     |
| 3               |  |            |                     |
| 4               |  |            |                     |
| 5               |  |            |                     |

## E1. CIA EXAM – 1

### a. Model Question Paper - 1

|           |                     |  |   |        |    |              |            |              |
|-----------|---------------------|--|---|--------|----|--------------|------------|--------------|
| Crs Code: | 17CV561             | Sem:   | V | Marks: | 30 | Time:        | 75 minutes |              |
| Course:   | Traffic engineering |  |   |        |    |              |            |              |
| -         | -                   | <b>Note: Answer any 1 full question, from each module.</b>     |   |        |    | <b>Marks</b> | <b>CO</b>  | <b>Level</b> |
| 1         | a                   | Explain PIEV theory.   |   |        |    | 5            | CO1        | L1           |
|           | b                   | Explain vehicle characteristics and road user characteristics. |   |        |    | 5            | CO1        | L2           |

|   |   |  |   |     |    |
|---|---|--|---|-----|----|
|   | c | Note the urban traffic problems.                 | 5 | CO2 | L3 |
| 2 | a | Explain fundamentals of traffic flow.            | 5 | CO1 | L2 |
|   | b | Explain planning of roads in town.               | 5 | CO1 | L4 |
|   | c | Explain vehicle performance characteristics.     | 5 | CO2 | L3 |
| 3 | a | Explain traffic surveys.                         | 5 | CO3 | L1 |
|   | b | Explain jurny time and delay survey.             | 5 | CO4 | L2 |
|   | c | Explain traffic forecasting and level of service | 5 | CO4 | L1 |
| 4 | a | Explain vehicle volume survey.                   | 5 | CO3 | L2 |
|   | b | Explain vehicle parking survey.                  | 5 | CO4 | L2 |
|   | c | Explain accident analysis and control mesures.   | 5 | CO4 | L1 |

### b. Assignment -1

Note: A distinct assignment to be assigned to each student.

| Model Assignment Questions |                     |      |   |        |        |       |                  |
|----------------------------|---------------------|------|---|--------|--------|-------|------------------|
| Crs Code:                  | 17CV561             | Sem: | V | Marks: | 5 / 10 | Time: | 90 – 120 minutes |
| Course:                    | Traffic engineering |      |   |        |        |       |                  |

Note: Each student to answer 2-3 assignments. Each assignment carries equal mark.

| SNo | USN | Assignment Description   | Marks | CO  | Level |
|-----|-----|--|-------|-----|-------|
| 1   |     | Types of Highways.   | 5     | CO1 | L2    |
| 2   |     | Vehicle characteristics  | 5     | CO2 | L3    |
| 3   |     | Mode of vehicles, PIEV theory.                                 | 5     | CO2 | L4    |
| 4   |     | Urban problems   | 5     | CO1 | L3    |
| 5   |     | Infrastructure planning  | 5     | CO1 | L2    |
| 6   |     | Land use at rural and urban areas                              | 5     | CO1 | L3    |
| 7   |     | Types o traffic survey.  | 5     | CO2 | L3    |
| 8   |     | O & D survey   | 5     | CO1 | L4    |
| 9   |     | Parking survey   | 5     | CO1 | L4    |
| 10  |     | Traffic volume studies   | 5     | CO2 | L3    |
| 11  |     | Traffic forecasting  | 5     | CO3 | L3    |
| 12  |     | Level of service   | 5     | CO4 | L3    |
| 13  |     | Explain PIEV theory.   | 5     | CO4 | L4    |
| 14  |     | Explain vehicle characteristics and road user characteristics. | 5     | CO3 | L3    |
| 15  |     | Note the urban traffic problems.                               | 5     | CO4 | L2    |
| 16  |     | Explain fundamentals of traffic flow.                          | 5     | CO4 | L3    |
| 17  |     | Explain planning of roads in town.                             | 5     | CO1 | L3    |
| 18  |     | Explain vehicle performance characteristics.                   | 5     | CO2 | L4    |
| 19  |     | Explain traffic surveys.                                       | 5     | CO2 | L4    |
| 20  |     | Explain jurny time and delay survey.                           | 5     | CO1 | L3    |
| 21  |     | Explain traffic forecasting and level of service               | 5     | CO1 | L3    |
| 22  |     | Explain vehicle volume survey.                                 | 5     | CO1 | L3    |
| 23  |     | Explain vehicle parking survey.                                | 5     | CO2 | L4    |
| 24  |     | Explain accident analysis and control measures.                | 5     | CO1 | L3    |
| 25  |     | Explain PIEV theory.   | 5     | CO1 | L2    |
| 26  |     | Explain vehicle characteristics and road user characteristics. | 5     | CO2 | L3    |
| 27  |     | Note the urban traffic problems.                               | 5     | CO3 | L3    |
| 28  |     | Explain fundamentals of traffic flow.                          | 5     | CO4 | L4    |
| 29  |     | Explain planning of roads in town.                             | 5     | CO4 | L4    |
| 30  |     | Explain traffic surveys.                                       | 5     | CO3 | L3    |
| 31  |     | Explain jurny time and delay survey.                           | 5     | CO4 | L3    |
| 32  |     | Explain traffic forecasting and level of service               | 5     | CO4 | L3    |
| 33  |     | Explain vehicle volume survey.                                 | 5     | CO4 | L4    |
| 34  |     | Explain vehicle parking survey.                                | 5     | CO4 | L3    |
| 35  |     | Types of Highways.   | 5     | CO1 | L2    |

|    |  |   |     |    |
|----|--|---|-----|----|
| 36 | Vehicle characteristics  | 5 | CO2 | L3 |
| 37 | Mode of vehicles, PIEV theory.                                 | 5 | CO2 | L4 |
| 38 | Urban problems   | 5 | CO1 | L3 |
| 39 | Infrastructure planning  | 5 | CO1 | L2 |
| 40 | Land use at rural and urban areas                              | 5 | CO1 | L3 |
| 41 | Types o traffic survey.  | 5 | CO2 | L3 |
| 42 | O & D survey   | 5 | CO1 | L4 |
| 43 | Parking survey   | 5 | CO1 | L4 |
| 44 | Traffic volume studies   | 5 | CO2 | L3 |
| 45 | Traffic forecasting  | 5 | CO3 | L3 |
| 46 | Level of service   | 5 | CO4 | L3 |
| 47 | Explain PIEV theory.   | 5 | CO4 | L4 |
| 48 | Explain vehicle characteristics and road user characteristics. | 5 | CO3 | L3 |
| 49 | Note the urban traffic problems.                               | 5 | CO4 | L2 |
| 50 | Explain fundamentals of traffic flow.                          | 5 | CO4 | L3 |
| 51 | Explain planning of roads in town.                             | 5 | CO1 | L3 |
| 52 | Explain vehicle performance characteristics.                   | 5 | CO2 | L4 |
| 53 | Explain traffic surveys.                                       | 5 | CO2 | L4 |
| 54 | Explain jurny time and delay survey.                           | 5 | CO1 | L3 |
| 55 | Explain traffic forecasting and level of service               | 5 | CO1 | L3 |
| 56 | Explain vehicle volume survey.                                 | 5 | CO1 | L3 |
| 57 | Explain vehicle parking survey.                                | 5 | CO2 | L4 |
| 58 | Explain accident analysis and control measures.                | 5 | CO1 | L3 |
| 59 | Explain PIEV theory.   | 5 | CO1 | L2 |
| 60 | Explain vehicle characteristics and road user characteristics. | 5 | CO2 | L3 |
| 61 | Note the urban traffic problems.                               | 5 | CO3 | L3 |
| 62 | Explain fundamentals of traffic flow.                          | 5 | CO4 | L4 |
| 63 | Explain planning of roads in town.                             | 5 | CO4 | L4 |
| 64 | Explain traffic surveys.                                       | 5 | CO3 | L3 |
| 65 | Explain jurny time and delay survey.                           | 5 | CO4 | L3 |
| 66 | Explain traffic forecasting and level of service               | 5 | CO4 | L3 |
| 67 | Explain vehicle volume survey.                                 | 5 | CO4 | L4 |
| 68 | Explain vehicle parking survey.                                | 5 | CO4 | L3 |
| 69 | Types of Highways.   | 5 | CO1 | L2 |
| 70 | Vehicle characteristics  | 5 | CO2 | L3 |
| 71 | Mode of vehicles, PIEV theory.                                 | 5 | CO2 | L4 |
| 72 | Urban problems   | 5 | CO1 | L3 |
| 73 | Infrastructure planning  | 5 | CO1 | L2 |
| 74 | Land use at rural and urban areas                              | 5 | CO1 | L3 |
| 75 | Types o traffic survey.  | 5 | CO2 | L3 |
| 76 | O & D survey   | 5 | CO1 | L4 |
| 77 | Parking survey   | 5 | CO1 | L4 |
| 78 | Traffic volume studies   | 5 | CO2 | L3 |
| 79 | Traffic forecasting  | 5 | CO3 | L3 |
| 80 | Level of service   | 5 | CO4 | L3 |
| 81 | Explain PIEV theory.   | 5 | CO4 | L4 |
| 82 | Explain vehicle characteristics and road user characteristics. | 5 | CO3 | L3 |
| 83 | Note the urban traffic problems.                               | 5 | CO4 | L2 |
| 84 | Explain fundamentals of traffic flow.                          | 5 | CO4 | L3 |
| 85 | Explain planning of roads in town.                             | 5 | CO1 | L3 |
| 86 | Explain vehicle performance characteristics.                   | 5 | CO2 | L4 |
| 87 | Explain traffic surveys.                                       | 5 | CO2 | L4 |
| 88 | Explain jurny time and delay survey.                           | 5 | CO1 | L3 |
| 89 | Explain traffic forecasting and level of service               | 5 | CO1 | L3 |
| 90 | Explain vehicle volume survey.                                 | 5 | CO1 | L3 |
| 91 | Explain vehicle parking survey.                                | 5 | CO2 | L4 |
| 92 | Explain accident analysis and control measures.                | 5 | CO1 | L3 |
| 93 | Explain PIEV theory.   | 5 | CO1 | L2 |

|     |  |   |     |    |
|-----|--|---|-----|----|
| 94  | Explain vehicle characteristics and road user characteristics. | 5 | CO2 | L3 |
| 95  | Note the urban traffic problems.                               | 5 | CO3 | L3 |
| 96  | Explain fundamentals of traffic flow.                          | 5 | CO4 | L4 |
| 97  | Explain planning of roads in town.                             | 5 | CO4 | L4 |
| 98  | Explain traffic surveys.                                       | 5 | CO3 | L3 |
| 99  | Explain jury time and delay survey.                            | 5 | CO4 | L3 |
| 100 | Explain traffic forecasting and level of service               | 5 | CO4 | L3 |
| 101 | Explain vehicle volume survey.                                 | 5 | CO4 | L4 |
| 102 | Explain vehicle parking survey.                                | 5 | CO4 | L3 |
| 103 | Types of Highways.   | 5 | CO1 | L2 |
| 104 | Vehicle characteristics  | 5 | CO2 | L3 |
| 105 | Mode of vehicles, PIEV theory.                                 | 5 | CO2 | L4 |
| 106 | Urban problems   | 5 | CO1 | L3 |
| 107 | Infrastructure planning  | 5 | CO1 | L2 |
| 108 | Land use at rural and urban areas                              | 5 | CO1 | L3 |
| 109 | Types o traffic survey.  | 5 | CO2 | L3 |

## D2. TEACHING PLAN - 2

### Module – 3

|                 |  |                   |                     |
|-----------------|--|-------------------|---------------------|
| <b>Title:</b>   | Divide and Conquer   | <b>Appr Time:</b> | 16 Hrs              |
| <b>a</b>        | <b>Course Outcomes</b>   | -                 | <b>Blooms Level</b> |
| -               | The student should be able to:                                     | -                 | <b>Level</b>        |
| 1               | understand accident , causes , prevention analysis                 | CO5               | L2                  |
| 2               | understand proper location for parking & analysis.                 | CO6               | L3                  |
| <b>b</b>        | <b>Course Schedule</b>   |                   |                     |
| <b>Class No</b> | <b>Module Content Covered</b>                                      | <b>CO</b>         | <b>Level</b>        |
| 1               | Intersection Design- channelization                                | CO5               | L4                  |
| 2               | Rotary intersection design   | CO5               | L3                  |
| 3               | Signal design,   | CO5               | L3                  |
| 4               | Coordination of signals,   | CO5               | L2                  |
| 5               | Grade separation<br>Traffic signs including VMS                    | CO6               | L2                  |
| 6               | road markings  | CO6               | L3                  |
| 7               | Significant roles of traffic control personnel,                    | CO6               | L2                  |
| 8               | Networking pedestrian facilities & cycle tracks.                   | CO6               | L2                  |
| <b>c</b>        | <b>Application Areas</b>   | <b>CO</b>         | <b>Level</b>        |
| 1               | To fix the design speed for different modes.                       | CO5               | L3                  |
| 2               | Efficient use of land for road condition for rural and urban area. | CO6               | L4                  |
| <b>d</b>        | <b>Review Questions</b>  | -                 | -                   |
| 1               | Explain intersection design.                                       | CO5               | L1                  |
| 2               | Explain signal design.   | CO5               | L3                  |
| 3               | Explain the co ordination signals.                                 | CO5               | L2                  |
| 4               | Explain grade separator.   | CO6               | L4                  |
| 5               | Explain the role of traffic control personnel                      | CO6               | L2                  |
| 6               | Explain pedastril facilities.                                      | CO6               | L5                  |
| 7               | Explain the purpose of cycle tracks                                | CO6               | L2                  |
| <b>e</b>        | <b>Experiences</b>   | -                 | -                   |
| 1               |  |                   |                     |
| 2               |  |                   |                     |
| 3               |  |                   |                     |
| 4               |  |                   |                     |

|   |  |  |  |
|---|--|--|--|
| 5 |  |  |  |
|---|--|--|--|

## Module – 4

|                 |  |                   |                     |
|-----------------|--|-------------------|---------------------|
| <b>Title:</b>   | Divide and Conquer   | <b>Appr Time:</b> | 16 Hrs              |
| <b>a</b>        | <b>Course Outcomes</b>   | -                 | <b>Blooms Level</b> |
| -               | The student should be able to:                                   | -                 |                     |
| 1               | analyze Infrastructure for parking and analyze.                  | CO7               | L2                  |
| 2               | analyses proper location for signals & signs.                    | CO8               | L3                  |
| <b>b</b>        | <b>Course Schedule</b>   |                   |                     |
| <b>Class No</b> | <b>Module Content Covered</b>                                    |                   | <b>Level</b>        |
| 1               | Traffic Safety and Environment                                   | CO7               | L2                  |
| 2               | Road accidents, Causes, effect,                                  | CO7               | L3                  |
| 3               | prevention and cost, Street lighting,                            | CO7               | L2                  |
| 4               | Traffic and environment hazards                                  | CO7               | L2                  |
| 5               | Air and Noise Pollution,   | CO8               | L2                  |
| 6               | abatement measures, Promotion                                    | CO8               | L3                  |
| 7               | Promotion and integration of public transportation,              | CO8               | L3                  |
| 8               | Promotion of non-motorized transport.                            | CO8               | L2                  |
| <b>c</b>        | <b>Application Areas</b>   | <b>CO</b>         | <b>Level</b>        |
| 1               | Smooth traffic flow and providing of signals to avoid conjetion. | CO7               | L3                  |
| 2               | To control air and noise pollution at urban area.                | CO8               | L4                  |
| <b>d</b>        | <b>Review Questions</b>  | -                 | -                   |
| 1               | Causes of road accidents.  | CO7               | L1                  |
| 2               | Provision of street lighting.                                    | CO7               | L3                  |
| 3               | Explain Traffic and environmental hazards.                       | CO8               | L2                  |
| 4               | Explain air and noise pollution.                                 | CO7               | L4                  |
| 5               | Explain promotion public transportation.                         | CO8               | L2                  |
| 6               | Explain promotion of non motorized traffic.                      | CO8               | L5                  |
| <b>e</b>        | <b>Experiences</b>   |                   |                     |

## E2. CIA EXAM – 2

### a. Model Question Paper - 2

|           |                     |   |   |        |    |              |            |              |
|-----------|---------------------|---|---|--------|----|--------------|------------|--------------|
| Crs Code: | 17CV561             | Sem:  | V | Marks: | 30 | Time:        | 75 minutes |              |
| Course:   | Traffic engineering |   |   |        |    |              |            |              |
| -         | -                   | <b>Note: Answer any 1 full questions, from each module.</b> |   |        |    | <b>Marks</b> | <b>CO</b>  | <b>Level</b> |
| 1         | a                   | Explain intersection design.                                |   |        |    | 5            | CO5        | L1           |
|           | b                   | Explain rotary intersection design.                         |   |        |    | 5            | CO5        | L2           |
|           | c                   | Explain signal design.                                      |   |        |    | 5            | CO6        | L3           |
| 2         | a                   | Explain coordination of signals.                            |   |        |    | 5            | CO5        | L2           |
|           | b                   | Explain road marking.                                       |   |        |    | 5            | CO5        | L4           |
|           | c                   | Explain the significance of traffic control personnel.      |   |        |    | 5            | CO6        | L3           |
| 3         | a                   | Explain the causes of road accidents.                       |   |        |    | 5            | CO7        | L1           |

|   |   |  |   |     |    |
|---|---|--|---|-----|----|
|   | b | Explain the prevention measures to prevent the road accidents.         | 5 | CO7 | L2 |
|   | c | Explain the street light and causes of environmental hazards.          | 5 | CO8 | L1 |
| 4 | a | What are the measures taken for prevention of air and noise pollution? | 5 | CO7 | L2 |
|   | b | What are the measures taken to improve the public transportation?      | 5 | CO8 | L2 |
|   | c | Explain the traffic system management.                                 | 5 | CO8 | L1 |

## b. Assignment – 2

Note: A distinct assignment to be assigned to each student.

### Model Assignment Questions

|           |                     |      |   |        |        |       |                  |
|-----------|---------------------|------|---|--------|--------|-------|------------------|
| Crs Code: | 17CV561             | Sem: | V | Marks: | 5 / 10 | Time: | 90 – 120 minutes |
| Course:   | Traffic engineering |      |   |        |        |       |                  |

Note: Each student to answer 2-3 assignments. Each assignment carries equal mark.

| SNo | USN | Assignment Description   | Marks | CO   | Level |
|-----|-----|--|-------|------|-------|
| 1   |     | Define study area. And sample size                                     | 5     | CO8  | L2    |
| 2   |     | Explain on street parking, off street parking                          | 5     | CO9  | L3    |
| 3   |     | Analyses measures to reduce accident.                                  | 5     | CO10 | L4    |
| 4   |     | What are the causes of accident.                                       | 5     | CO9  | L3    |
| 5   |     | Explain Queuing theory .   | 5     | CO5  | L1    |
| 6   |     | Explain car following theory.  | 5     | CO5  | L2    |
| 7   |     | Explain Poisson's distribution and application to traffic engineering  | 5     | CO6  | L3    |
| 8   |     | Causes of road accidents.  | 5     | CO6  | L2    |
| 9   |     | Provision of street lighting.  | 5     | CO5  | L2    |
| 10  |     | Explain Traffic and environmental hazards.                             | 5     | CO5  | L4    |
| 11  |     | Explain air and noise pollution.                                       | 5     | CO6  | L3    |
| 12  |     | Explain promotion public transportation.                               | 5     | CO7  | L1    |
| 13  |     | Explain promotion of non motorized traffic.                            | 5     | CO7  | L1    |
| 14  |     | Explain intersection design.   | 5     | CO8  | L2    |
| 15  |     | Explain rotary intersection design.                                    | 5     | CO8  | L1    |
| 16  |     | Explain signal design.   | 5     | CO7  | L2    |
| 17  |     | Explain coordination of signals.                                       | 5     | CO8  | L2    |
| 18  |     | Explain road marking.  | 5     | CO8  | L2    |
| 19  |     | Explain the significance of traffic control personnel.                 | 5     | CO6  | L3    |
| 20  |     | Explain the causes of road accidents.                                  | 5     | CO7  | L1    |
| 21  |     | Explain the prevention measures to prevent the road accidents.         | 5     | CO7  | L1    |
| 22  |     | Explain the street light and causes of environmental hazards.          | 5     | CO8  | L2    |
| 23  |     | What are the measures taken for prevention of air and noise pollution? | 5     | CO8  | L1    |
| 24  |     | What are the measures taken to improve the public transportation?      | 5     | CO7  | L2    |
| 25  |     | Explain the traffic system management.                                 | 5     | CO8  | L2    |
| 26  |     | Explain intersection design.   | 5     | CO8  | L2    |
| 27  |     | Explain rotary intersection design.                                    | 5     | CO6  | L3    |
| 28  |     | Explain signal design.   | 5     | CO7  | L1    |
| 29  |     | Explain coordination of signals.                                       | 5     | CO7  | L1    |
| 30  |     | Explain road marking.  | 5     | CO8  | L2    |
| 31  |     | Explain the causes of road accidents.                                  | 5     | CO8  | L1    |
| 32  |     | Explain the prevention measures to prevent the road accidents.         | 5     | CO7  | L2    |
| 33  |     | Explain the street light and causes of environmental hazards.          | 5     | CO8  | L2    |
| 34  |     | What are the measures taken for prevention of air and noise pollution? | 5     | CO8  | L2    |
| 35  |     | What are the measures taken to improve the public transportation?      | 5     | CO8  | L3    |
| 36  |     | Define study area. And sample size                                     | 5     | CO8  | L2    |

|    |  |   |      |    |
|----|--|---|------|----|
| 37 | Explain on street parking, off street parking                          | 5 | CO9  | L3 |
| 38 | Analyses measures to reduce accident.                                  | 5 | CO10 | L4 |
| 39 | What are the causes of accident.                                       | 5 | CO9  | L3 |
| 40 | Explain Queuing theory .   | 5 | CO5  | L1 |
| 41 | Explain car following theory.  | 5 | CO5  | L2 |
| 42 | Explain Poisson's distribution and application to traffic engineering  | 5 | CO6  | L3 |
| 43 | Causes of road accidents.  | 5 | CO6  | L2 |
| 44 | Provision of street lighting.  | 5 | CO5  | L2 |
| 45 | Explain Traffic and environmental hazards.                             | 5 | CO5  | L4 |
| 46 | Explain air and noise pollution.                                       | 5 | CO6  | L3 |
| 47 | Explain promotion public transportation.                               | 5 | CO7  | L1 |
| 48 | Explain promotion of non motorized traffic.                            | 5 | CO7  | L1 |
| 49 | Explain intersection design.   | 5 | CO8  | L2 |
| 50 | Explain rotary intersection design.                                    | 5 | CO8  | L1 |
| 51 | Explain signal design.   | 5 | CO7  | L2 |
| 52 | Explain coordination of signals.                                       | 5 | CO8  | L2 |
| 53 | Explain road marking.  | 5 | CO8  | L2 |
| 54 | Explain the significance of traffic control personnel.                 | 5 | CO6  | L3 |
| 55 | Explain the causes of road accidents.                                  | 5 | CO7  | L1 |
| 56 | Explain the prevention measures to prevent the road accidents.         | 5 | CO7  | L1 |
| 57 | Explain the street light and causes of environmental hazards.          | 5 | CO8  | L2 |
| 58 | What are the measures taken for prevention of air and noise pollution? | 5 | CO8  | L1 |
| 59 | What are the measures taken to improve the public transportation?      | 5 | CO7  | L2 |
| 60 | Explain the traffic system management.                                 | 5 | CO8  | L2 |
| 61 | Explain intersection design.   | 5 | CO8  | L2 |
| 62 | Explain rotary intersection design.                                    | 5 | CO6  | L3 |
| 63 | Explain signal design.   | 5 | CO7  | L1 |
| 64 | Explain coordination of signals.                                       | 5 | CO7  | L1 |
| 65 | Explain road marking.  | 5 | CO8  | L2 |
| 66 | Explain the causes of road accidents.                                  | 5 | CO8  | L1 |
| 67 | Explain the prevention measures to prevent the road accidents.         | 5 | CO7  | L2 |
| 68 | Explain the street light and causes of environmental hazards.          | 5 | CO8  | L2 |
| 69 | What are the measures taken for prevention of air and noise pollution? | 5 | CO8  | L2 |
| 70 | What are the measures taken to improve the public transportation?      | 5 | CO8  | L3 |
| 71 | Define study area. And sample size                                     | 5 | CO8  | L2 |
| 72 | Explain on street parking, off street parking                          | 5 | CO9  | L3 |
| 73 | Analyses measures to reduce accident.                                  | 5 | CO10 | L4 |
| 74 | What are the causes of accident.                                       | 5 | CO9  | L3 |
| 75 | Explain Queuing theory .   | 5 | CO5  | L1 |
| 76 | Explain car following theory.  | 5 | CO5  | L2 |
| 77 | Explain Poisson's distribution and application to traffic engineering  | 5 | CO6  | L3 |
| 78 | Causes of road accidents.  | 5 | CO6  | L2 |
| 79 | Provision of street lighting.  | 5 | CO5  | L2 |
| 80 | Explain Traffic and environmental hazards.                             | 5 | CO5  | L4 |
| 81 | Explain air and noise pollution.                                       | 5 | CO6  | L3 |
| 82 | Explain promotion public transportation.                               | 5 | CO7  | L1 |
| 83 | Explain promotion of non motorized traffic.                            | 5 | CO7  | L1 |
| 84 | Explain intersection design.   | 5 | CO8  | L2 |
| 85 | Explain rotary intersection design.                                    | 5 | CO8  | L1 |
| 86 | Explain signal design.   | 5 | CO7  | L2 |

|     |  |   |      |    |
|-----|--|---|------|----|
| 87  | Explain coordination of signals.                                       | 5 | CO8  | L2 |
| 88  | Explain road marking.  | 5 | CO8  | L2 |
| 89  | Explain the significance of traffic control personnel.                 | 5 | CO6  | L3 |
| 90  | Explain the causes of road accidents.                                  | 5 | CO7  | L1 |
| 91  | Explain the prevention measures to prevent the road accidents.         | 5 | CO7  | L1 |
| 92  | Explain the street light and causes of environmental hazards.          | 5 | CO8  | L2 |
| 93  | What are the measures taken for prevention of air and noise pollution? | 5 | CO8  | L1 |
| 94  | What are the measures taken to improve the public transportation?      | 5 | CO7  | L2 |
| 95  | Explain the traffic system management.                                 | 5 | CO8  | L2 |
| 96  | Explain intersection design.   | 5 | CO8  | L2 |
| 97  | Explain rotary intersection design.                                    | 5 | CO6  | L3 |
| 98  | Explain signal design.   | 5 | CO7  | L1 |
| 99  | Explain coordination of signals.                                       | 5 | CO7  | L1 |
| 100 | Explain road marking.  | 5 | CO8  | L2 |
| 101 | Explain the causes of road accidents.                                  | 5 | CO8  | L1 |
| 102 | Explain the prevention measures to prevent the road accidents.         | 5 | CO7  | L2 |
| 103 | Explain the street light and causes of environmental hazards.          | 5 | CO8  | L2 |
| 104 | What are the measures taken for prevention of air and noise pollution? | 5 | CO8  | L2 |
| 105 | What are the measures taken to improve the public transportation?      | 5 | CO8  | L3 |
| 106 | Define study area. And sample size                                     | 5 | CO8  | L2 |
| 107 | Explain on street parking, off street parking                          | 5 | CO9  | L3 |
| 108 | Analyses measures to reduce accident.                                  | 5 | CO10 | L4 |
| 109 | What are the causes of accident.                                       | 5 | CO9  | L3 |

### D3. TEACHING PLAN - 3

#### Module - 5

|                 |   |            |                     |
|-----------------|---|------------|---------------------|
| Title:          | Divide and Conquer  | Appr Time: | 16 Hrs              |
| <b>a</b>        | <b>Course Outcomes</b>  | -          | <b>Blooms Level</b> |
| -               | The student should be able to:                                    | -          |                     |
| 1               | design proper lighting system.                                    | CO9        | L2                  |
| 2               | understand proper management of traffic & travel demand analyses. | CO10       | L3                  |
| <b>b</b>        | <b>Course Schedule</b>  |            |                     |
| <b>Class No</b> | <b>Module Content Covered</b>                                     | <b>CO</b>  | <b>Level</b>        |
| 1               | Area Traffic Management System                                    | CO9        | L2                  |
| 2               | Traffic System Management (TSM) with IRC standards,               | CO9        | L3                  |
| 3               | Traffic Regulatory Measures                                       | CO9        | L2                  |
| 4               | Travel Demand Management (TDM), Direct and indirect methods,      | CO9        | L2                  |
| 5               | Congestion and parking pricing,                                   | CO10       | L3                  |
| 6               | All segregation methods- Coordination among different agencies    | CO10       | L3                  |
| 7               | Intelligent Transport System for traffic management               | CO10       | L2                  |
| 8               | enforcement and education.  | CO10       | L1                  |
| <b>c</b>        | <b>Application Areas</b>  | <b>CO</b>  | <b>Level</b>        |
| 1               | For smooth flow of traffic at urban area proper scheduling.       | CO10       | L3                  |
| 2               | To avoid accident and conjection proper education for the people. | CO9        | L4                  |
| <b>d</b>        | <b>Review Questions</b>   | -          | -                   |
| 1               | Explain traffic management system.                                | CO10       | L1                  |
| 2               | Explain traffic rotary measures.                                  | CO10       | L3                  |
| 3               | Explain the travel management systems.                            | CO9        | L2                  |



|          |  |      |    |
|----------|--|------|----|
| 4        | Explain arrangement and pricing of parking.                    | CO9  | L4 |
| 5        | Explain the traffic intelligent system for traffic management. | CO10 | L2 |
| <b>e</b> | <b>Experiences</b>   | -    | -  |
| 1        |  |      |    |
| 2        |  |      |    |
| 3        |  |      |    |
| 4        |  |      |    |
| 5        |  |      |    |

### E3. CIA EXAM – 3

#### a. Model Question Paper - 3

|           |                     |   |   |        |    |              |            |              |
|-----------|---------------------|---|---|--------|----|--------------|------------|--------------|
| Crs Code: | 17CV561             | Sem:  | V | Marks: | 30 | Time:        | 75 minutes |              |
| Course:   | Traffic engineering |   |   |        |    |              |            |              |
| -         | -                   | <b>Note: Answer any 1 full questions, from each module.</b>                 |   |        |    | <b>Marks</b> | <b>CO</b>  | <b>Level</b> |
| 1         | a                   | Explain traffic management systems.   |   |        |    | 8            | CO9        | L1           |
|           | b                   | Explain traffic management and compare with IRC standards.                  |   |        |    | 7            | CO9        | L2           |
| 2         | a                   | Explain the design of rotary.   |   |        |    | 8            | CO9        | L2           |
|           | b                   | Explain travel demand management by direct method.                          |   |        |    | 7            | CO9        | L4           |
| 3         | a                   | Explain travel demand management by indirect method.                        |   |        |    | 8            | CO10       | L1           |
|           | b                   | Explain the parking facilities and fixing of pricing.                       |   |        |    | 7            | CO10       | L2           |
| 4         | a                   | Explain the intelligent transport system for traffic management.            |   |        |    | 8            | CO10       | L2           |
|           | b                   | Explain encouraging education of public for traffic flow in the urban area. |   |        |    | 7            | CO10       | L2           |

#### b. Assignment – 3

Note: A distinct assignment to be assigned to each student.

|   |                     |   |   |        |        |              |                  |              |
|---|---------------------|---|---|--------|--------|--------------|------------------|--------------|
| <b>Model Assignment Questions</b>   |                     |   |   |        |        |              |                  |              |
| Crs Code:   | 17CV561             | Sem:  | V | Marks: | 5 / 10 | Time:        | 90 – 120 minutes |              |
| Course:   | Traffic engineering |   |   |        |        |              |                  |              |
| Note: Each student to answer 2-3 assignments. Each assignment carries equal mark. |                     |   |   |        |        |              |                  |              |
| <b>SNo</b>  | <b>USN</b>          | <b>Assignment Description</b>   |   |        |        | <b>Marks</b> | <b>CO</b>        | <b>Level</b> |
| 1   |                     | Explain traffic regulations.  |   |        |        | 5            | CO9              | L2           |
| 2   |                     | Explain the traffic marking and its importance .                            |   |        |        | 5            | CO9              | L3           |
| 3   |                     | Explain synchronized signals.   |   |        |        | 5            | CO10             | L4           |
| 4   |                     | Explain Webster's method of signal design.                                  |   |        |        | 5            | CO10             | L3           |
| 5   |                     | Explain traffic rotary elements and designs                                 |   |        |        | 5            | CO9              | L2           |
| 6   |                     | Explain street light parking  |   |        |        | 5            | CO9              | L3           |
| 7   |                     | Explain traffic management system.  |   |        |        | 5            | CO10             | L4           |
| 8   |                     | Explain traffic rotary measures.  |   |        |        | 5            | CO10             | L3           |
| 9   |                     | Explain the travel management systems.                                      |   |        |        | 5            | CO10             | L2           |
| 10  |                     | Explain arrangement and pricing of parking.                                 |   |        |        | 5            | CO9              | L3           |
| 11  |                     | Explain the traffic intelligent system for traffic management.              |   |        |        | 5            | CO9              | L4           |
| 12  |                     | Explain traffic management systems.   |   |        |        | 5            | CO10             | L3           |
| 13  |                     | Explain traffic management and compare with IRC standards.                  |   |        |        | 5            | CO10             | L2           |
| 14  |                     | Explain the design of rotary.   |   |        |        | 5            | CO9              | L2           |
| 15  |                     | Explain travel demand management by direct method.                          |   |        |        | 5            | CO10             | L3           |
| 16  |                     | Explain travel demand management by indirect method.                        |   |        |        | 5            | CO10             | L4           |
| 17  |                     | Explain the parking facilities and fixing of pricing.                       |   |        |        | 5            | CO9              | L3           |
| 18  |                     | Explain the intelligent transport system for traffic management.            |   |        |        | 5            | CO9              | L2           |
| 19  |                     | Explain encouraging education of public for traffic flow in the urban area. |   |        |        | 5            | CO10             | L3           |

|    |   |   |      |    |
|----|---|---|------|----|
| 20 | Explain traffic management systems.   | 5 | CO10 | L4 |
| 21 | Explain traffic management and compare with IRC standards.                  | 5 | CO10 | L3 |
| 22 | Explain the design of rotary.   | 5 | CO9  | L2 |
| 23 | Explain travel demand management by direct method.                          | 5 | CO9  | L3 |
| 24 | Explain the parking facilities and fixing of pricing.                       | 5 | CO10 | L2 |
| 25 | Explain traffic regulations.  | 5 | CO9  | L2 |
| 26 | Explain the traffic marking and its importance .                            | 5 | CO9  | L3 |
| 27 | Explain synchronized signals.   | 5 | CO10 | L4 |
| 28 | Explain Webster's method of signal design.                                  | 5 | CO10 | L3 |
| 29 | Explain traffic rotary elements and designs                                 | 5 | CO9  | L2 |
| 30 | Explain street light parking  | 5 | CO9  | L3 |
| 31 | Explain traffic management system.  | 5 | CO10 | L4 |
| 32 | Explain traffic rotary measures.  | 5 | CO10 | L3 |
| 33 | Explain the travel management systems.                                      | 5 | CO10 | L2 |
| 34 | Explain arrangement and pricing of parking.                                 | 5 | CO9  | L3 |
| 35 | Explain the traffic intelligent system for traffic management.              | 5 | CO9  | L4 |
| 36 | Explain traffic management systems.   | 5 | CO10 | L3 |
| 37 | Explain traffic management and compare with IRC standards.                  | 5 | CO10 | L2 |
| 38 | Explain the design of rotary.   | 5 | CO9  | L2 |
| 39 | Explain travel demand management by direct method.                          | 5 | CO10 | L3 |
| 40 | Explain travel demand management by indirect method.                        | 5 | CO10 | L4 |
| 41 | Explain the parking facilities and fixing of pricing.                       | 5 | CO9  | L3 |
| 42 | Explain the intelligent transport system for traffic management.            | 5 | CO9  | L2 |
| 43 | Explain encouraging education of public for traffic flow in the urban area. | 5 | CO10 | L3 |
| 44 | Explain traffic management systems.   | 5 | CO10 | L4 |
| 45 | Explain traffic management and compare with IRC standards.                  | 5 | CO10 | L3 |
| 46 | Explain the design of rotary.   | 5 | CO9  | L2 |
| 47 | Explain travel demand management by direct method.                          | 5 | CO9  | L3 |
| 48 | Explain the parking facilities and fixing of pricing.                       | 5 | CO10 | L2 |
| 49 | Explain traffic regulations.  | 5 | CO9  | L2 |
| 50 | Explain the traffic marking and its importance .                            | 5 | CO9  | L3 |
| 51 | Explain synchronized signals.   | 5 | CO10 | L4 |
| 52 | Explain Webster's method of signal design.                                  | 5 | CO10 | L3 |
| 53 | Explain traffic rotary elements and designs                                 | 5 | CO9  | L2 |
| 54 | Explain street light parking  | 5 | CO9  | L3 |
| 55 | Explain traffic management system.  | 5 | CO10 | L4 |
| 56 | Explain traffic rotary measures.  | 5 | CO10 | L3 |
| 57 | Explain the travel management systems.                                      | 5 | CO10 | L2 |
| 58 | Explain arrangement and pricing of parking.                                 | 5 | CO9  | L3 |
| 59 | Explain the traffic intelligent system for traffic management.              | 5 | CO9  | L4 |
| 60 | Explain traffic management systems.   | 5 | CO10 | L3 |
| 61 | Explain traffic management and compare with IRC standards.                  | 5 | CO10 | L2 |
| 62 | Explain the design of rotary.   | 5 | CO9  | L2 |
| 63 | Explain travel demand management by direct method.                          | 5 | CO10 | L3 |
| 64 | Explain travel demand management by indirect method.                        | 5 | CO10 | L4 |
| 65 | Explain the parking facilities and fixing of pricing.                       | 5 | CO9  | L3 |
| 66 | Explain the intelligent transport system for traffic management.            | 5 | CO9  | L2 |
| 67 | Explain encouraging education of public for traffic flow in the urban area. | 5 | CO10 | L3 |
| 68 | Explain traffic management systems.   | 5 | CO10 | L4 |
| 69 | Explain traffic management and compare with IRC standards.                  | 5 | CO10 | L3 |
| 70 | Explain the design of rotary.   | 5 | CO9  | L2 |
| 71 | Explain travel demand management by direct method.                          | 5 | CO9  | L3 |
| 72 | Explain the parking facilities and fixing of pricing.                       | 5 | CO10 | L2 |
| 73 | Explain traffic regulations.  | 5 | CO9  | L2 |

|     |   |   |      |    |
|-----|---|---|------|----|
| 74  | Explain the traffic marking and its importance .                            | 5 | CO9  | L3 |
| 75  | Explain synchronized signals.   | 5 | CO10 | L4 |
| 76  | Explain Webster's method of signal design.                                  | 5 | CO10 | L3 |
| 77  | Explain traffic rotary elements and designs                                 | 5 | CO9  | L2 |
| 78  | Explain street light parking  | 5 | CO9  | L3 |
| 79  | Explain traffic management system.  | 5 | CO10 | L4 |
| 80  | Explain traffic rotary measures.  | 5 | CO10 | L3 |
| 81  | Explain the travel management systems.                                      | 5 | CO10 | L2 |
| 82  | Explain arrangement and pricing of parking.                                 | 5 | CO9  | L3 |
| 83  | Explain the traffic intelligent system for traffic management.              | 5 | CO9  | L4 |
| 84  | Explain traffic management systems.   | 5 | CO10 | L3 |
| 85  | Explain traffic management and compare with IRC standards.                  | 5 | CO10 | L2 |
| 86  | Explain the design of rotary.   | 5 | CO9  | L2 |
| 87  | Explain travel demand management by direct method.                          | 5 | CO10 | L3 |
| 88  | Explain travel demand management by indirect method.                        | 5 | CO10 | L4 |
| 89  | Explain the parking facilities and fixing of pricing.                       | 5 | CO9  | L3 |
| 90  | Explain the intelligent transport system for traffic management.            | 5 | CO9  | L2 |
| 91  | Explain encouraging education of public for traffic flow in the urban area. | 5 | CO10 | L3 |
| 92  | Explain traffic management systems.   | 5 | CO10 | L4 |
| 93  | Explain traffic management and compare with IRC standards.                  | 5 | CO10 | L3 |
| 94  | Explain the design of rotary.   | 5 | CO9  | L2 |
| 95  | Explain travel demand management by direct method.                          | 5 | CO9  | L3 |
| 96  | Explain the parking facilities and fixing of pricing.                       | 5 | CO10 | L2 |
| 97  | Explain traffic regulations.  | 5 | CO9  | L2 |
| 98  | Explain the traffic marking and its importance .                            | 5 | CO9  | L3 |
| 99  | Explain synchronized signals.   | 5 | CO10 | L4 |
| 100 | Explain Webster's method of signal design.                                  | 5 | CO10 | L3 |
| 101 | Explain traffic rotary elements and designs                                 | 5 | CO9  | L2 |
| 102 | Explain street light parking  | 5 | CO9  | L3 |
| 103 | Explain traffic management system.  | 5 | CO10 | L4 |
| 104 | Explain traffic rotary measures.  | 5 | CO10 | L3 |
| 105 | Explain the travel management systems.                                      | 5 | CO10 | L2 |
| 106 | Explain arrangement and pricing of parking.                                 | 5 | CO9  | L3 |
| 107 | Explain the traffic intelligent system for traffic management.              | 5 | CO9  | L4 |
| 108 | Explain traffic management systems.   | 5 | CO10 | L3 |
| 109 | Explain traffic management and compare with IRC standards.                  | 5 | CO10 | L2 |
|     |   |   |      |    |

## F. EXAM PREPARATION

### 1. University Model Question Paper

|           |                     |   |   |          |              |                |             |              |
|-----------|---------------------|---|---|----------|--------------|----------------|-------------|--------------|
| Course:   | Traffic engineering |   |   |          | Month / Year | Dec-Jan / 2018 |             |              |
| Crs Code: | 17CV561             | Sem:  | V | Marks:80 | 100          | Time:          | 180 minutes |              |
| -         | <b>Note</b>         | Answer all FIVE full questions. Choosing one full question from each model                    |   |          |              | <b>Marks</b>   | <b>CO</b>   | <b>Level</b> |
| 1         | a                   | List the different road users characteristics and explain the concept of PIEV theory.         |   |          |              | 8              | CO1         | L2           |
|           | b                   | Discuss various urban traffic problem that India is facing. List some remedial measures also. |   |          |              | 8              |             | L3           |
| <b>OR</b> |                     |   |   |          |              |                |             |              |
| -         | a                   | What are the different vehicular characteristics which affect road design ? Explain.          |   |          |              | 8              | CO1         | L3           |
|           | b                   | Write short notes on :  |   |          |              | 8              | CO2         | L2           |
|           |                     | i) Fundamentals of traffic flow   |   |          |              |                |             |              |
|           |                     | ii) Integrated planning of town.  |   |          |              |                |             |              |

| 2                   | a                           | Mention various application of O and D study. Explain road side interview method of collecting O and D data.   | 8                           | CO3                         | L2                    |                             |         |    |          |     |          |    |          |     |          |    |          |    |          |    |          |    |          |     |           |    |   |     |    |
|---------------------|-----------------------------|--|-----------------------------|-----------------------------|-----------------------|-----------------------------|---------|----|----------|-----|----------|----|----------|-----|----------|----|----------|----|----------|----|----------|----|----------|-----|-----------|----|---|-----|----|
|                     | b                           | Spot speed studies were carried out at a certain stretch road highway and the consolidated data collected are given below:<br><table border="1" data-bbox="288 331 1198 638"> <thead> <tr> <th>Speed range (km ph)</th> <th>Number of vehicles observed</th> <th>Speed arrange (km ph)</th> <th>Number of vehicles observed</th> </tr> </thead> <tbody> <tr> <td>0 to 10</td> <td>12</td> <td>50 to 60</td> <td>255</td> </tr> <tr> <td>10 to 20</td> <td>18</td> <td>60 to 70</td> <td>119</td> </tr> <tr> <td>20 to 30</td> <td>68</td> <td>70 to 80</td> <td>43</td> </tr> <tr> <td>30 to 40</td> <td>89</td> <td>80 to 90</td> <td>33</td> </tr> <tr> <td>40 to 50</td> <td>204</td> <td>90 to 100</td> <td>09</td> </tr> </tbody> </table> <p>Determine :<br/> i) Upper and lower values of speed limit for regulation.<br/> ii) Design speed for checking the geometric design element of the highway.</p> | Speed range (km ph)         | Number of vehicles observed | Speed arrange (km ph) | Number of vehicles observed | 0 to 10 | 12 | 50 to 60 | 255 | 10 to 20 | 18 | 60 to 70 | 119 | 20 to 30 | 68 | 70 to 80 | 43 | 30 to 40 | 89 | 80 to 90 | 33 | 40 to 50 | 204 | 90 to 100 | 09 | 8 | CO4 | L3 |
| Speed range (km ph) | Number of vehicles observed | Speed arrange (km ph)  | Number of vehicles observed |                             |                       |                             |         |    |          |     |          |    |          |     |          |    |          |    |          |    |          |    |          |     |           |    |   |     |    |
| 0 to 10             | 12                          | 50 to 60   | 255                         |                             |                       |                             |         |    |          |     |          |    |          |     |          |    |          |    |          |    |          |    |          |     |           |    |   |     |    |
| 10 to 20            | 18                          | 60 to 70   | 119                         |                             |                       |                             |         |    |          |     |          |    |          |     |          |    |          |    |          |    |          |    |          |     |           |    |   |     |    |
| 20 to 30            | 68                          | 70 to 80   | 43                          |                             |                       |                             |         |    |          |     |          |    |          |     |          |    |          |    |          |    |          |    |          |     |           |    |   |     |    |
| 30 to 40            | 89                          | 80 to 90   | 33                          |                             |                       |                             |         |    |          |     |          |    |          |     |          |    |          |    |          |    |          |    |          |     |           |    |   |     |    |
| 40 to 50            | 204                         | 90 to 100  | 09                          |                             |                       |                             |         |    |          |     |          |    |          |     |          |    |          |    |          |    |          |    |          |     |           |    |   |     |    |
|                     |                             | <b>OR</b>  |                             |                             |                       |                             |         |    |          |     |          |    |          |     |          |    |          |    |          |    |          |    |          |     |           |    |   |     |    |
| -                   | a                           | Explain the following terms:<br>i) Time headway.<br>ii) Space headway.<br>iii) Traffic volume.<br>iv) Level of service.  | 8                           | CO3                         | L2                    |                             |         |    |          |     |          |    |          |     |          |    |          |    |          |    |          |    |          |     |           |    |   |     |    |
|                     | b                           | Define the term "Spot speed study". With neat sketch explain enoscope method of measuring spot speed study.  | 8                           | CO4                         | L3                    |                             |         |    |          |     |          |    |          |     |          |    |          |    |          |    |          |    |          |     |           |    |   |     |    |
| 3                   | a                           | What are the advantages and disadvantages of rotary intersection?  | 8                           | CO5                         | L3                    |                             |         |    |          |     |          |    |          |     |          |    |          |    |          |    |          |    |          |     |           |    |   |     |    |
|                     | b                           | i) Define briefly signal "cycle" and " Interval"<br>ii) The average normal flow of traffic on cross roads A and B during design period are 400 and 250 PCU per hour: the saturation flow values on these roads are estimated as 1250 and 1000 PCU per hour respectively . The all red time required for pedestrian crossing is 12 secs. Design two phase traffic signal by Webster's method. Sketch phase diagram also.  | 8                           |                             | L2,L3                 |                             |         |    |          |     |          |    |          |     |          |    |          |    |          |    |          |    |          |     |           |    |   |     |    |
| -                   | a                           | Mention various classification of traffic signs. Explain any two of them with neat sketches.   | 8                           | CO5                         | L3                    |                             |         |    |          |     |          |    |          |     |          |    |          |    |          |    |          |    |          |     |           |    |   |     |    |
|                     | b                           | Write short notes on :<br>i) Road markings<br>ii) Channelized intersections<br>iii) Unchannelized intersections.   | 8                           | CO6                         | L2                    |                             |         |    |          |     |          |    |          |     |          |    |          |    |          |    |          |    |          |     |           |    |   |     |    |
| 4                   | a                           | i) What are the major sources of traffic related noise pollution ? Explain .<br>ii) Explain controlling method s of noise pollution by traffic.  | 8                           | CO7                         | L3                    |                             |         |    |          |     |          |    |          |     |          |    |          |    |          |    |          |    |          |     |           |    |   |     |    |
|                     | b                           | What are the major air pollutants due to road traffic ? Explain consequences of each.  | 8                           | CO8                         | L4                    |                             |         |    |          |     |          |    |          |     |          |    |          |    |          |    |          |    |          |     |           |    |   |     |    |
|                     |                             | <b>OR</b>  |                             |                             |                       |                             |         |    |          |     |          |    |          |     |          |    |          |    |          |    |          |    |          |     |           |    |   |     |    |
| -                   | a                           | i) Write various objectives of road accidents studies<br>ii) Explain in detail the causes for road accidents.  | 8                           | CO7                         | L2                    |                             |         |    |          |     |          |    |          |     |          |    |          |    |          |    |          |    |          |     |           |    |   |     |    |
|                     | b                           | Write short notes on :<br>i) Promotion of non- motorized transport<br>ii) Measures to decrease accidents.  | 8                           | CO8                         | L2                    |                             |         |    |          |     |          |    |          |     |          |    |          |    |          |    |          |    |          |     |           |    |   |     |    |
| 5                   | a                           | Define traffic congestion. Explain different method of traffic restrain ( reduction).  | 8                           | CO9                         | L3                    |                             |         |    |          |     |          |    |          |     |          |    |          |    |          |    |          |    |          |     |           |    |   |     |    |
|                     | b                           | Explain Intelligent transport system for traffic management.   | 8                           | CO10                        | L2                    |                             |         |    |          |     |          |    |          |     |          |    |          |    |          |    |          |    |          |     |           |    |   |     |    |
|                     |                             | <b>OR</b>  |                             |                             |                       |                             |         |    |          |     |          |    |          |     |          |    |          |    |          |    |          |    |          |     |           |    |   |     |    |
|                     | a                           | Suggest some traffic regulatory measures suitable for urban areas.   |                             | CO9                         | L3                    |                             |         |    |          |     |          |    |          |     |          |    |          |    |          |    |          |    |          |     |           |    |   |     |    |
|                     | b                           | Write short notes on:<br>i) Requirement of good pricing system   | 8                           | CO10                        | L2                    |                             |         |    |          |     |          |    |          |     |          |    |          |    |          |    |          |    |          |     |           |    |   |     |    |

|  |   |  |  |  |
|--|---|--|--|--|
|  | ii) Travel demand management<br>iii) Area traffic control<br>iv) Traffic system management. |  |  |  |
|--|---|--|--|--|

## 2. SEE Important Questions

|           |  |  |   |          |              |                   |      |
|-----------|--|--|---|----------|--------------|-------------------|------|
| Course:   | Traffic engineering  |  |   |          | Month / Year | May / 2018        |      |
| Crs Code: | 17CV561  | Sem:   | V | Marks:80 | 100          | Time: 180 minutes |      |
|           | <b>Note</b> Answer all FIVE full questions. All questions carry equal marks. |  |   |          | -            | -                 |      |
| Module    | Qno.   | Important Question   |   |          | Marks        | CO                | Year |
| 1         | 1  | Explain PIEV theory.   |   |          | 6            | CO1               |      |
|           | 2  | Explain vehicle characteristics and road user characteristics.         |   |          | 8            | CO1               |      |
|           | 3  | Note the urban traffic problems.                                       |   |          | 7            | CO2               |      |
|           | 4  | Explain fundamentals of traffic flow.                                  |   |          | 6            | CO2               |      |
|           | 5  | Explain planning of roads in town.                                     |   |          | 8            | CO2               |      |
| 2         | 1  | Explain traffic surveys.   |   |          | 8            | CO3               |      |
|           | 2  | Explain jurny time and delay survey.                                   |   |          | 8            | CO3               |      |
|           | 3  | Explain traffic forecasting and level of service                       |   |          | 7            | CO3               |      |
|           | 4  | Explain vehicle volume survey.   |   |          | 6            | CO4               |      |
|           | 5  | Explain vehicle parking survey.  |   |          | 8            | CO4               |      |
| 3         | 1  | Explain intersection design.   |   |          | 8            | CO5               |      |
|           | 2  | Explain rotary intersection design.                                    |   |          | 7            | CO5               |      |
|           | 3  | Explain signal design.   |   |          | 6            | CO5               |      |
|           | 4  | Explain coordination of signals.                                       |   |          | 8            | CO6               |      |
|           | 5  | Explain road marking.  |   |          | 5            | CO6               |      |
| 4         | 1  | Explain the causes of road accidents.                                  |   |          | 7            | CO7               |      |
|           | 2  | Explain the prevention measures to prevent the road accidents.         |   |          | 8            | CO7               |      |
|           | 3  | Explain the street light and causes of environmental hazards.          |   |          | 6            | CO7               |      |
|           | 4  | What are the measures taken for prevention of air and noise pollution? |   |          | 8            | CO8               |      |
|           | 5  | What are the measures taken to improve the public transportation?      |   |          | 8            | CO8               |      |
| 5         | 1  | Explain traffic management systems.                                    |   |          | 8            | CO9               |      |
|           | 2  | Explain traffic management and compare with IRC standards.             |   |          | 7            | CO9               |      |
|           | 3  | Explain the design of rotary.  |   |          | 7            | CO10              |      |
|           | 4  | Explain travel demand management by direct method.                     |   |          | 5            | CO10              |      |
|           | 5  | Explain the parking facilities and fixing of pricing.                  |   |          | 6            | CO10              |      |

## G. Content to Course Outcomes

### 1. TLPA Parameters

**Table 1: TLPA – Example Course**

| Module # | Course Content or Syllabus (Split module content into 2 parts which have similar concepts)   | Content Teaching Hours | Blooms' Learning Levels for Content | Final Blooms' Level | Identified Action Verbs for Learning | Instruction on Methods for Learning | Assessment Methods to Measure Learning |
|----------|--|------------------------|-------------------------------------|---------------------|--------------------------------------|-------------------------------------|--|
| A        | B  | C                      | D                                   | E                   | F                                    | G                                   | H                                      |
| 1        | Road uses characteristics, Road characteristics, vehicular characteristics Fundamentals of Traffic Flow, Urban Traffic problems in India | 4                      | - L1<br>- L2                        | L2                  | Understand                           | - Lecture<br>-                      | CIA<br>Assignment                      |
| 1        | Integrated planning of town, country   |                        | - L1                                | L3                  | Apply                                | -                                   | CIA                                    |

|   |   |   |              |    |                               |                         |                   |
|---|---|---|--------------|----|-------------------------------|-------------------------|-------------------|
|   | regional and all urban infrastructures, Sustainable approach- land use & transport and modal integration.   | 4 | - L3         |    |                               | Lecture<br>- Tutorial   | Assignment        |
| 2 | Traffic Surveys- Speed, journey time and delay surveys, Vehicles Volume Survey including non-motorized transports, Methods and interpretation, Origin Destination Survey, Methods and presentation, Parking Survey, | 4 | - L1<br>- L3 | L3 | Apply                         | - Lecture               | CIA<br>Assignment |
| 2 | Accident analyses-Methods, interpretation and presentation, Statistical applications in traffic studies and traffic forecasting, Level of service- Concept applications and significance.                           | 4 | - L2<br>- L3 | L4 | - Analyze                     | - Lecture               | CIA<br>Assignment |
| 3 | Intersection Design- channelization Rotary intersection Signal design, Coordination of signals, Grade separation  | 4 | - L3<br>- L4 | L4 | - Analyze                     | - Lecture               | CIA<br>Assignment |
| 3 | Traffic signs including VMS and road markings Significant roles of traffic control personnel, Networking pedestrian facilities & cycle tracks. Networking pedestrian facilities & cycle tracks.                     | 4 | - L3         | L3 | - Apply                       | - Lecture<br>- Tutorial | CIA<br>Assignment |
| 4 | Traffic Safety and Environment: Road accidents, Causes, effect, prevention and cost, Street lighting, Traffic and environment hazards   | 4 | - L3         | L3 | Apply                         | - Lecture<br>- Tutorial | CIA<br>Assignment |
| 4 | Air and Noise Pollution, abatement measures, Promotion Promotion and integration of public transportation, Promotion of non-motorized transport.  | 4 | - L3         | L3 | -design of air quality models | - Lecture<br>- Tutorial | CIA<br>Assignment |
| 5 | Area Traffic Management System Traffic System Management (TSM) with IRC standards, Traffic Regulatory Measures, Travel Demand Management (TDM),   | 4 | - L1<br>- L4 | L4 | -Apply                        | - Lecture               | CIA<br>Assignment |
| 5 | Direct and indirect methods, Congestion and parking pricing, All segregation methods- Coordination among different agencies, Intelligent Transport System for traffic management, enforcement and education.        | 4 | - L1<br>- L3 | L3 | -Apply                        | - Lecture               | CIA<br>Assignment |

## 2. Concepts and Outcomes:

**Table 2: Concept to Outcome – Example Course**

| Module # | Learning or Outcome from study of the Content or Syllabus | Identified Concepts from Content | Final Concept | Concept Justification (What all Learning Happened from the study of Content / Syllabus. A short word for learning or | CO Components (1.Action Verb, 2.Knowledge, 3.Condition / Methodology, 4.Benchmark) | Course Outcome<br><br><b>Student Should be able to ...</b> |
|----------|---|----------------------------------|---------------|--|--|--|
|          |   |                                  |               |  |  |  |

|   |  |                              |   | outcome)   |  |   |
|---|--|------------------------------|---|--|--|---|
| A | I  | J                            | K   | L  | M  | N   |
| 1 | able to understand vehicle characteristics.                      | Traffic characteristics      | Road characteristics, Urban transport planning. | vehicle characteristics.                               | - Understand vehicle characteristics.<br>-                     | able to understand vehicle characteristics.                       |
| 1 | able to understand planning of highway for rural and urban area. | Traffic planning             | .   | planning of highway                                    | - Apply planning of highway<br>-                               | understand planning of highway for rural and urban area.          |
| 2 | understand survey procedure, Traffic design speed.               | Traffic survey               | Vehicular traffic survey, O & D survey          | Traffic design speed.                                  | - Apply Traffic design speed.                                  | understand survey procedure, Traffic design speed.                |
| 2 | learn measuring of O & D data and analysis.                      | Traffic studies              |   | O & D data and analysis.                               | - Analyze O & D data and analysis.                             | learn measuring of O & D data and analysis.                       |
| 3 | understand accident , causes prevention analysis                 | Traffic Design               | Traffic safety, smooth traffic flow.            | accident , causes , prevention analysis                | - Analyze accident , causes , prevention analysis              | understand accident , causes , prevention analysis                |
| 3 | understand proper location for parking & analysis.               | Traffic Signs                |   | parking & analysis.                                    | - Apply parking & analysis.<br>-                               | understand proper location for parking & analysis.                |
| 4 | analyze Infrastructure for parking and analyze.                  | Traffic safety               | Over speed, Pollution control                   | Analysis   | - Apply Analysis<br>-  | analyze Infrastructure for parking and analyze.                   |
| 4 | analyses proper location for signals & signs.                    | Environmental hazards        |   | location for signals & signs.                          | - analyze location for signals & signs.                        | analyses proper location for signals & signs.                     |
| 5 | design proper lighting system.                                   | Traffic management           | Regulation, Education.                          | proper lighting system                                 | - Apply proper lighting system.                                | design proper lighting system.                                    |
| 5 | able to understand vehicle characteristics.                      | Intelligent transport system |   | proper management of traffic & travel demand analyses. | - Apply proper management of traffic & travel demand analyses. | understand proper management of traffic & travel demand analyses. |