Bharati Vidyapeeth Institute of Technology

Navi Mumbai

Certificate

This is to certify that, Mr/ Ms. ……. Roll No. …… of fifth Semester of Diploma in Civil engineering of Bharati Vidyapeeth Institute of Technology, Navi Mumbai (Inst.code:0027) has satisfactorily completed the term work in the subject Traffic Engineering (22507) for the academic year 20…. to 20…. as prescribed in the MSBTE curriculum.

Place: …….. **Enrollment No……**

Date:…….. **Exam. Seat No.……**

Sign:

Name:

Subject Teacher **Head of the Department** **Principal**

Seal of Institution

List of experiments and progressive assessment for term work (TW) D-3

Academic Year: **Name of Faculty:**

Course code: 22507 **Subject Code: TEN**

Name of candidate: **Enroll no. :**

Semester: FIFTH **Max marks : 25 Min marks :10**

Sr. No.	Title	Date of performance	Date of submission	Marks	Sign of teacher
1	Measure the traffic volume in morning peak hour to analyze traffic composition on the road way.				
2	Measure the traffic volume in morning peak hour to analyze traffic composition at intersection.				
3	Measure the traffic volume in non-peak hours to analyze traffic composition at intersection.				
4	Prepare a report of trip generation and trip attraction between two zones on the basis of origin-destination study within area of your town/city.				
5	Measure the spot speed on corridor of road way to analyze the percentile speed graphically.				
6	Prepare a report of a field visit to any major road intersection in your locality to identify the type, working of traffic signals along with your recommendations if any.				
7	Suggest the relevant vehicle parking system for your campus along with your recommendations if any in the form of a report.				

8	Prepare a report of a field visit to any road intersection in your locality to identify its type along with its sketch.				
9	Identify the existing street lighting system of any two types of roads.				
10	Identify the existing type of trees to suggest any relevant maintenance required.				
11	Draw the collision diagram for any case study of road accident.				
12	Prepare the report on the causes of accident and preventive measures suggested by you for the situation in practical no. 11.				
Total marks out of 100					
Marks out of 25					

EXPERIMENT: 1

Aim:

To measure the traffic volume in morning peak hour to analyze traffic composition on the road way.

Theory:

Traffic volume study is the traffic study, involving the process of counting the number of vehicles passing a given point on the road during a specified time interval.

Traffic volume is defined as the number of vehicle passing a section of road per unit time at any selected period.

Procedure:

The practical will be carried out through manual method.

1. A section of road is selected for carrying out the study.
2. The no. of vehicles entering the study area during a particular period of time should be counted manually.
3. Details like time of recording, type of vehicle, etc. should be entered in the field data sheet provided below.
4. The total traffic volume in the morning peak hour can be obtained by analyzing the data recorded in the field data sheet.

Field Data Sheet for Traffic Census

Date and Day of week: **Road classification:**

District: **State:**

Hour of count	**Cars, jeeps, vans, 3-wheelers**	**Buses**	**Trucks**	**Motorcycles & scooters**	**Animal driven vehicle**	**Cycles**	**Others (specify)**	**Remarks, including weather conditions**
From: **To:**								
Hourly Total								

Observation & Calculations: (Use a blank page if needed)

Result:

Total traffic volume during morning peak hour from …….. to …… =……..

Questions:

1. Define traffic volume.
2. Enlist different types of traffic studies.
3. List out different methods of collection of traffic volume count data.

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Marks obtained			Dated sign of teacher
Process Related (15)	**Product Related (10)**	**Total (25)**	

EXPERIMENT: 2

Aim:

To measure the traffic volume in morning peak hour to analyze traffic composition at intersection.

Theory:

Traffic volume study is the traffic study, involving the process of counting the number of vehicles passing a given point on the road during a specified time interval.

Traffic volume is defined as the number of vehicle passing a section of road per unit time at any selected period.

Procedure:

The practical will be carried out through manual method.

1. Intersection of road is selected for carrying out the study.
2. The roads joining at the intersection should be monitored separately.
3. The no. of vehicles entering the study area through different roads during a particular period of time should be counted manually.
4. Details like time of recording, specific road number, type of vehicle, etc. should be entered in the field data sheet provided below.
5. The total traffic volume in the morning peak hour can be obtained by analyzing the data recorded in the field data sheet of different roads joining at the intersection.

Field Data Sheet for Traffic Census

Date and Day of week: **Road classification:**

District: **State:**

Hour of count	Cars, jeeps, vans, 3-wheelers	Buses	Trucks	Motorcycles & scooters	Animal driven vehicle	Cycles	Others (specify)	Remarks, including weather conditions
From: To:								
Hourly Total								

Observation & Calculations: (Use a blank page if needed)

Result:

Total traffic volume during morning peak hour from ….. to …… at intersection =…….

Questions:

1. State the purpose of traffic volume study.
2. State the information collected in traffic volume study.

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Marks obtained			Dated sign of teacher
Process Related (15)	**Product Related (10)**	**Total (25)**	

EXPERIMENT: 3

Aim:

To measure the traffic volume in non-peak hours to analyze traffic composition at intersection.

Theory:

Traffic volume study is the traffic study, involving the process of counting the number of vehicles passing a given point on the road during a specified time interval.

Traffic volume is defined as the number of vehicle passing a section of road per unit time at any selected period.

Procedure:

The practical will be carried out through manual method.

1. Intersection of road is selected for carrying out the study.
2. The roads joining at the intersection should be monitored separately.
3. The no. of vehicles entering the study area through different roads during a particular period of time should be counted manually.
4. Details like time of recording, specific road number, type of vehicle, etc. should be entered in the field data sheet provided below.
5. The total traffic volume in the non-peak hour can be obtained by analyzing the data recorded in the field data sheet of different roads joining at the intersection.

Field Data Sheet for Traffic Census

Date and Day of week: **Road classification:**

District: **State:**

Hour of count	**Cars, jeeps, vans, 3-wheelers**	**Buses**	**Trucks**	**Motorcycles & scooters**	**Animal driven vehicle**	**Cycles**	**Others (specify)**	**Remarks, including weather conditions**
From: **To:**								
Hourly Total								

Observation & Calculations: (Use a blank page if needed)

Result:

Total traffic volume during non-peak hour from …….. to …… =……..

Questions:

1. Define traffic studies.
2. Enlist different types of traffic studies.
3. State the purpose of traffic studies.

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Marks obtained			Dated sign of teacher
Process Related (15)	**Product Related (10)**	**Total (25)**	

EXPERIMENT: 4

Aim:

To prepare a report of trip generation and trip attraction between two zones on the basis of origin-destination study within area of your town/city.

Theory:

Origin-Destination surveys provide a detailed picture of the trip patterns and travel choices of a city's or region's residents. These surveys collect valuable data related to households, individuals, and trips. This information allows stakeholders to understand travel patterns and characteristics; measure trends; provide input to travel demand model development, forecasting, and planning for area-wide transportation infrastructure needs and services; and, monitor progress in implementing transportation policies.

Procedure:

Road side interview method-

1. Within the survey area, interview stations should be decided.
2. Vehicles are stopped at these interview stations and the answers to the prescribed questionnaire are collected on the spot.
3. The traffic may be filtered through a prescribed lane by previous warnings sighs and with the help of police so that each driver of the selected sample of vehicles is interviewed.
4. The details collected can be analyzed and the report should be prepared.
5. A copy of the survey form is presented below.

   Survey Questionnaire:

   Location:

   Date:

   STANDARD FORMAT

   Origin-Destination Survey

   Questions

   Please take a moment to answer a few questions about your trip. Your responses will help determine the need for improvements in this area.

   1) Where did your trip begin?

      City/Town _____

      State _____

      Zip _____

   2) What type of place is your trip start point?

❒ Primary Residence ❒ Workplace ❒ Store ❒ School (I am a student)
❒ Recreation Area ❒Other _____

3) Where did your trip end?
City/Town _____
State _____
Zip _____
4) What type of place is your trip end point?
❒ Primary Residence ❒ Workplace ❒ Store ❒ School (I am a student)
❒ Recreation Area ❒ Other _____
5) What was the purpose of your trip?
❒ Work Commute ❒ Business Related ❒ Shopping ❒ School (attend class)
❒Recreation ❒Other _____
6) How many people were in the vehicle, including the driver?
❒ 1 ❒ 2 ❒ 3 ❒ 4 ❒ 5 or more
7) What type of vehicle were you in?
❒ Passenger vehicle (car, motorcycle, SUV, pick-up truck, minivan)
❒ Commercial vehicle ❒Other_____
8) Do you regularly use this route?
❒ Yes ❒ No
9) Please add any comments on transportation you may have.
Comments

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Thank you very much for your cooperation!

Result:

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Questions:

1. Describe the necessity of origin and destination study.
2. List the different methods of O-D survey.
3. List the different details collected during home-interview method.

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Marks obtained			**Dated sign of teacher**
Process Related (15)	**Product Related (10)**	**Total (25)**	

EXPERIMENT: 5

Aim:

To measure the spot speed on corridor of road way to analyze the percentile speed graphically.

Theory:

Spot speed studies are used to determine the speed distribution of a traffic stream at a specified location. The data gathered in spot speed studies are used to determine vehicle speed percentiles, which are useful in making many speed-related decisions. For a spot speed study at a selected location, a sample size of at least 30 and preferably more vehicles should be taken.

Spot speed data are gathered using one of three methods: (1) stopwatch method, (2) radar meter method, or (3) pneumatic road tube method.

Procedure:

1. The stopwatch method can be used to successfully complete a spot speed study using a small sample size taken over a relatively short period of time. The stopwatch method is a quick and inexpensive method for collecting speed data.
2. The specific location of a study should be chosen carefully so that recorded speeds reflect how vehicles typically travel along unimpeded sections of the road under free flow conditions.
3. The time taken by the vehicle to travel a specific stretch of road length should be noted.
4. The spot speed can be calculated from the time detected and distance.
5. The information should be tabulated and analyzed properly by representing it as frequency distribution table and cumulative frequency distribution curve, to obtain the percentile speeds.
6. The histogram should be plotted with speed on x-axis and percentage frequency on y-axis.
7. The cumulative frequency curve should be plotted with speed on x-axis and percentage cumulative frequency on y-axis.
8. The 95^{th}, 85^{th}, 50^{th} and 15^{th} percentile speeds should be noted from the cumulative frequency distribution curve.

Format of frequency distribution table

Speed class limits (kmph)	Mid-point speed (kmph)	No. of vehicles	Frequency (%)	Cumulative frequency (%)

Observation and calculation: (Use blank page if needed)

Result:

From the Cumulative frequency distribution curve,

95^{th} percentile speed= _____

85^{th} percentile speed= _____

50^{th} percentile speed= _____

15^{th} percentile speed= _____

Questions:

1. Discuss the method of spot-speed studies on a road section.
2. What is the application of percentile speed?
3. State the applications of spot speed study.

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Marks obtained			Dated sign of teacher
Process Related (15)	**Product Related (10)**	**Total (25)**	

EXPERIMENT: 6

Aim:

To prepare a report of a field visit to any major road intersection in your locality to identify the type, working of traffic signals along with your recommendations if any.

Theory:

An intersection is an at-grade junction where two or more roads or streets meet or cross. Intersections may be classified by number of road segments, traffic controls or lane design. In general, there are two types of intersections including signalized and un-signalized intersections.

The devices used for controlling, warning or guiding the traffic is called traffic signals. They are provided at intersection of roads to control and guide the traffic especially heavy vehicular traffic.

Procedure:

1. Identify the type of type of traffic signal at intersection.
2. The working of the traffic signals should also be studied.
3. Identify the position of traffic signals and also traffic signs and markings nearby.
4. Prepare a report including all these details and also some photographs of the intersection.

Result:

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Questions:

1. List out the types of traffic control devices useful in traffic engineering.
2. Give classification of road signs as per IRC.
3. List the points to be considered while erecting the traffic signs.
4. List the various types of road signals.

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Marks obtained			Dated sign of teacher
Process Related (15)	**Product Related (10)**	**Total (25)**	

EXPERIMENT: 7

Aim:

To suggest relevant vehicle parking system for your campus along with your recommendations if any in the form of a report.

Theory:

Parking is the act of stopping and disengaging a vehicle and leaving it unoccupied. Parking on both sides of a road is often permitted, though sometimes with restrictions. Countries and local governments have rules for design and use of parking spaces.

Procedure:

1) The campus site should be studied to understand the existing parking facilities.
2) The area which can be utilized as parking space should be identified.
3) The information about the average number of vehicles, and the different types of vehicles which uses the parking space should be collected.
4) The relevant parking system should be designed with the help of these details.
5) The report should include all these observations and sketches prepared for the study area.

Result:

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Questions:

1) State the need for parking studies.
2) Enlist the different types of parking surveys.
3) Define (i) Parking Load (ii)Parking Turn-over

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Marks obtained			Dated sign of teacher
Process Related (15)	Product Related (10)	Total (25)	

EXPERIMENT: 8

Aim:

To prepare a report of a field visit to any road intersection in your locality to identify its type along with its sketch.

Theory:

An intersection is an at-grade junction where two or more roads or streets meet or cross. Intersections may be classified by number of road segments, traffic controls or lane design. In general, there are two types of intersections including signalized and un-signalized intersections. It is the place where two or more roads are arranged to join or cross at same or different levels. Actually these are the spots of accidents if proper precautions are not taken in their design or layout. Thus, safety of vehicular traffic and pedestrians is very essential at these places. Pedestrian's movements at intersections produce increased obstacles and delays. Road intersections should be well planned and signaled properly.

Procedure:

1) The type of intersection should be identified.
2) The shape, dimensions should be studied and a sketch should be prepared.
3) Identify all the additional facilities like the channelizing islands, traffic markings, etc. provided in the site.
4) The report prepared should include all the information collected regarding the intersection, the sketches and photographs collected during the visit.

Result:

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Questions:

1) Give various types road intersection.
2) Define traffic island.
3) Describe channelizing islands with neat sketch.

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Marks obtained			Dated sign of teacher
Process Related (15)	**Product Related (10)**	**Total (25)**	

EXPERIMENT: 9

Aim:

To identify the existing street lighting system of any two types of roads.

Theory:

Street lighting is primarily intended to enable the road users to see accurately and easily the carriageway and the immediate surroundings in darkness. A large proportion of road accidents are caused in the night and one of the chief reasons is the unsatisfactory lighting. It is a system which gives source of light to the road users to safe, comfortable and convenient use of road.

Procedure:

1. Select any two different types of road.
2. Walk along the pavement to understand the street lighting system in each road.
3. The spacing between the lamps and the lantern arrangement should be noted.
4. The details regarding overhang or outreach of the lamp and also the mounting height should be recorded from the site.
5. A neat sketch should be drawn including all these points.

Observations: (Use blank page if needed)

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Result:

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Questions:

1. Define outreach of lamp.
2. What are the different factors affecting street lighting?

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Marks obtained			Dated sign of teacher
Process Related (15)	**Product Related (10)**	**Total (25)**	

EXPERIMENT: 10

Aim:

To identify the existing type of trees to suggest any relevant maintenance required.

Theory:

Road Arboriculture is defined as planning of plantation of trees along the roadway. This is an important aspect of road side development. It gives attractive, pleasant landscape to the road sides. The main objectives of arboriculture are to provide shade and give a pleasant drive to the road users. It also protects environmental degradation. It increases level of oxygen and decreases noise pollution. And it also prevents soil erosion along the road sides.

Procedure:

1. Select any important roadway.
2. Identify the type of trees planted on the road side.
3. Identify are the measures taken in that area to protect and maintain these trees, if any.
4. The spacing between two trees along the roadway should also be noted.
5. Record any suggestions which are relevant to the maintenance of the trees or ways by which more sunlight can be made to reach the carriage way in observations.

Observations: (Use blank page if needed)

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Result:

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Questions:

1. State the objectives of road arboriculture.
2. What are the different operations to be done to take care of the trees?

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Marks obtained			Dated sign of teacher
Process Related (15)	Product Related (10)	Total (25)	

EXPERIMENT: 11

Aim:

To draw the collision diagram for any case study of road accident.

Theory:

Collision diagrams are used to display and identify similar accident patterns. They provide information on the type and number of accidents; including conditions such as time of day, day of week, climatic conditions, pavement conditions, and other information critical to determining the causes of safety problems.

Procedure:

1. Collect any case study of a road accident.
2. Sketch the location diagram for the intersection or roadway section mentioned in the case study using a standard form
3. The sketch need not be to scale.
4. Show the path of each vehicle involved in the accident with adequate room for information.
5. Place a north arrow for orientation and any other descriptive information like location identification, period of analysis, labeling the roads.
6. Sketch the path of each vehicle to show vehicle maneuver, type of collision and accident severity, and time of day, day of wwek, date, lighting condition, pavement condition, other important information, e.g., alcohol involvement, etc.

Observations: (Use blank page if needed)

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Sample Collision Diagram

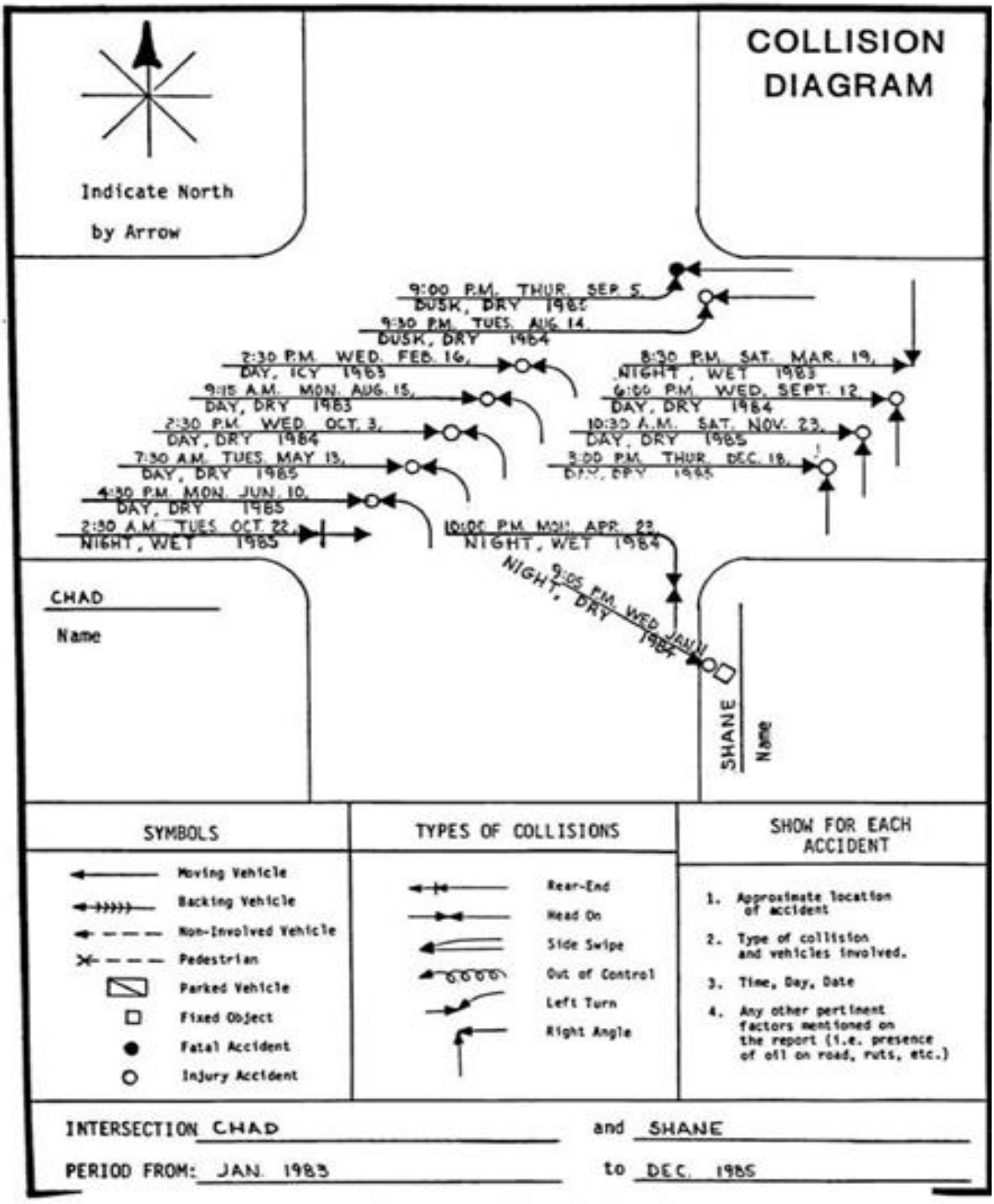

Figure 3. An example collision diagram.

Result:

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Questions:

1. Suggest preventive measures for avoiding the road accidents.

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Marks obtained			Dated sign of teacher
Process Related (15)	**Product Related (10)**	**Total (25)**	

EXPERIMENT: 12

Aim:

To prepare a report on the causes of accident and preventive measures suggested by you for the situation in practical no. 11.

Theory:

Collision diagrams are used to display and identify similar accident patterns. They provide information on the type and number of accidents; including conditions such as time of day, day of week, climatic conditions, pavement conditions, and other information critical to determining the causes of safety problems.

Procedure:

1. By studying the collision diagram, identify the causes of the accident.
2. Suggest any preventive measures in terms of road design, lighting system, rules and regulations, etc. that could have eliminated this particular road accident.
3. Prepare a report including all these details analyzed.

Result:

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Questions:

1. Explain any method of reporting and recording of road accident.

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Marks obtained			Dated sign of teacher
Process Related (15)	**Product Related (10)**	**Total (25)**	