NARSIMHA REDDY ENGINEERING COLLEGE
UGC AUTONOMOUS INSTITUTION
Maisammaguda (V), Kompally - 500100, Secunderabad, Telangana State, India

UGC - **Autonomous** Institute
Accredited by **NBA & NAAC** with **'A'** Grade
Approved by **AICTE**
Permanently affiliated to **JNTUH**

NRCM
Your roots to success....

9.UNIVERSITY PREVIOUS QUESTION PAPERS

Code No: 126AE

R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, May - 2017
TRANSPORTATION ENGINEERING – I
(Civil Engineering)

Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B
consists of 5 Units. Answer any one full question from each unit. Each question carries
10 marks and may have a, b, c as sub questions.

PART - A
                                                 (25 Marks)

1.a) List the various types of road patterns. [2]
 b) List the various requirements of Highway Ideal Alignment [3]
 c) List the various assumptions in the analysis of safe Overtaking Sight Distance. [2]
 d) Calculate the extra width required for a two lane highway having a horizontal curve of radius 200m, if the design speed is 80 Kmph. [3]
 e) Draw a neat sketch of Condition and Collision diagram. [2]
 f) Define traffic volume and traffic density and speed. [3]
 g) List the factors to be considered in the design of intersection at grade. [2]
 h) List the various types of on street and off street parking facilities. [3]
 i) List the various tests to be conducted to evaluate the strength properties of soils [2]
 j) Differentiate between Tack Coat and Prime Coat. [3]

PART - B
                                                 (50 Marks)

2.a) Discuss in detail, the various factors controlling the highway alignment with sketches.
 b) What is the necessity of Realignment? List and explain the various steps in Realignment. [5+5]

                                OR

3.a) What are the various recommendations of Jayakar Committee? How were these implemented?
 b) What are the various methods of classifying roads? Briefly outline the classification of urban roads. [5+5]

4.a) Explain PIEV Theory and the total reaction time of driver.
 b) Calculate the length of transition curve using the following data:
 Design speed =65 Kmph, Radius of circular curve = 220m, pavement width including extra widening = 7.5 m, allowable rate of introduction of super elevation (pavement is rotated about the centerline) is 1 in 150. [5+5]

                                OR

5.a) With the help of a neat sketch, explain the attainment of super elevation in the field.
 b) Calculate the length of vertical valley curve required between -1/30 and +1/25 grades for a speed of 80 Kmph, satisfying the Head light Sight Distance requirements. [5+5]

5.a) Determine the safe overtaking sight distance required for a two lane, two-way traffic road, given the speeds of overtaking and overtaken vehicles are 100 kmph and 70 kmph respectively. The acceleration of overtaking vehicle is 2.4 kmph/sec, spacing between vehicles is 20m, reaction time of driver is 2 sec and speed of vehicle coming in the opposite direction is 80kmph.

b) Find out the minimum length of transition curve required and the shift required to join the transition curve with circular curve of radius 200m, for a road passing through rolling terrain. Given design speed 65kmph, carriage way width 7.5m, rate of super elevation 1 in 150 and the road is rotated about the center line to achieve super elevation. [5+5]

6. What are the details collected in origin and destination surveys? Explain the most commonly adopted methods of O&D survey. [10]

OR

7. What are the objectives of road markings and road signs? Classify road markings and traffic signs giving two examples in each category. [10]

8. What are the various types of at-grade intersections? Describe them with suitable sketches. Mark the conflict points at T-intersection and four-legged intersection (for two-way traffic in both directions). [10]

OR

9.a) What are the purposes of channelization? What are the salient features of channelizing islands?

b) Explain the design considerations for a rotary. Discuss the advantages and limitations of a rotary intersection. [5+5]

10. Explain the steps in the construction of gravel roads and Water bound macadam roads. [10]

OR

11. What is the function of joints in cement concrete pavements? Write short notes on: Expansion joints, Contraction joints and Warping joints. [10]

---ooOoo---

R15

Code No: 126ZE

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, April - 2018
TRANSPORTATION ENGINEERING – I
(Civil Engineering)

Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A
(25 Marks)

1.a)	State the classification of roads as per first road development plan.	[2]
b)	Discuss the objectives of reconnaissance survey and state the instruments used for this purpose.	[3]
c)	Sketch the typical cross-section of a national highway and indicate all cross-sectional elements.	[2]
d)	What are the transition curves? Explain the functions.	[3]
e)	Explain the various causes of road accidents.	[2]
f)	Define: Spot speed, Running speed, Space-mean speed and Time-mean speed.	[3]
g)	What are the various traffic controls required at an intersection?	[2]
h)	Write a short notes on: Grade separated intersections and traffic islands.	[3]
i)	Explain the requirements of a good highway drainage system.	[2]
j)	What are the desirable characteristics of stone-aggregates for road construction?	[3]

PART - B
(50 Marks)

2.a) What is the need for highway planning? Discuss the benefits of well-planned highway system in the social and economic development of a country.
b) Describe and compare the various road development plans in India.   [5+5]

OR

3.a) What are the factors effecting highway alignment? Discuss in detail.
b) What are the various engineering drawings necessary for implementing a highway project? What are their recommended scales?   [5+5]

4.a) A two-lane highway with design speed of 120kmph is aligned with a horizontal curve of radius 200m. What is the super-elevation required to maintain this speed? If the maximum super-elevation rate of 0.07 and coefficient of lateral friction of 0.15 is to be provided along with limiting the radius to 200m, calculate the allowable speed.
b) A rising gradient of 1 in 25 meets a falling gradient of 1 in 50 on a national highway. The minimum stopping sight distance is 150m. Design speed is 100km/hr, determine the length of summit curve and the distance of highest point from the starting of 1 in 25 gradient.   [5+5]

OR

5.a) Determine the safe overtaking sight distance required for a two lane, two-way traffic road, given the speeds of overtaking and overtaken vehicles are 100 kmph and 70 kmph respectively. The acceleration of overtaking vehicle is 2.4 kmph/sec, spacing between vehicles is 20m, reaction time of driver is 2 sec and speed of vehicle coming in the opposite direction is 80kmph.

b) Find out the minimum length of transition curve required and the shift required to join the transition curve with circular curve of radius 200m, for a road passing through rolling terrain. Given design speed 65kmph, carriage way width 7.5m, rate of super elevation 1 in 150 and the road is rotated about the center line to achieve super elevation.   [5+5]

6. What are the details collected in origin and destination surveys? Explain the most commonly adopted methods of O&D survey.   [10]

OR

7. What are the objectives of road markings and road signs? Classify road markings and traffic signs giving two examples in each category.   [10]

8. What are the various types of at-grade intersections? Describe them with suitable sketches. Mark the conflict points at T-intersection and four-legged intersection (for two-way traffic in both directions).   [10]

OR

9.a) What are the purposes of channelization? What are the salient features of channelizing islands?

b) Explain the design considerations for a rotary. Discuss the advantages and limitations of a rotary intersection.   [5+5]

10. Explain the steps in the construction of gravel roads and Water bound macadam roads.   [10]

OR

11. What is the function of joints in cement concrete pavements? Write short notes on: Expansion joints, Contraction joints and Warping joints.   [10]

---ooOoo---

Code No: 126AE

$\boxed{\textbf{R13}}$

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, May - 2017
TRANSPORTATION ENGINEERING – I
(Civil Engineering)

Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a)	List the various types of road patterns.	[2]
b)	List the various requirements of Highway Ideal Alignment	[3]
c)	List the various assumptions in the analysis of safe Overtaking Sight Distance.	[2]
d)	Calculate the extra width required for a two lane highway having a horizontal curve of radius 200m,if the design speed is 80 Kmph.	[3]
e)	Draw a neat sketch of Condition and Collision diagram.	[2]
f)	Define traffic volume and traffic density and speed.	[3]
g)	List the factors to be considered in the design of intersection at grade.	[2]
h)	List the various types of on street and off street parking facilities.	[3]
i)	List the various tests to be conducted to evaluate the strength properties of soils	[2]
j)	Differentiate between Tack Coat and Prime Coat.	[3]

PART - B

(50 Marks)

2.a) Discuss in detail ,the various factors controlling the highway alignment with sketches.
  b) What is the necessity of Realignment? List and explain the various steps in Realignment. [5+5]

OR

3.a) What are the various recommendations of Jayakar Committee? How were these implemented?
  b) What are the various methods of classifying roads? Briefly outline the classification of urban roads. [5+5]

4.a) Explain PIEV Theory and the total reaction time of driver .
  b) Calculate the length of transition curve using the following data:
Design speed =65 Kmph, Radius of circular curve = 220m, pavement width including extra widening = 7.5 m, allowable rate of introduction of super elevation (pavement is rotated about the centerline) is 1 in 150. [5+5]

OR

5.a) With the help of a neat sketch, explain the attainment of super elevation in the field.
  b) Calculate the length of vertical valley curve required between -1/30 and +1/25 grades for a speed of 80 K~~www.ManaResults.co.in~~ight sight distance requirements. [5+5]

6.a) Identify and explain by grouping the vehicular characteristics which affect the various elements of road design.

b) Spot speed studies were carried out at a certain stretch of a highway with mixed traffic flow and the consolidated data collected are given below.

Speed range, kmph   No of vehicles observed   [5+5]

Speed range, kmph	No of vehicles observed
0-10	12
10 – 20	18
20 - 30	68
30 - 40	89
40 - 50	204
50 - 60	255
60 - 70	119
70 - 80	43
80 - 90	33
90 – 100	9

OR

7.a) Write a note on various road user characteristics affecting the traffic.

b) Briefly explain the various objectives and methods of O and D studies.   [5+5]

8.a) Briefly explain the various design factors to be considered in the design of rotary.

b) With neat sketches, explain the Different types of traffic Islands and conflicts at Intersections.   [5+5]

OR

9.a) List and explain the various advantages and disadvantages of Rotary.

b) List the various advantages of at grade and Grade separated Intersections.   [5+5]

10.a) List the specifications, materials and construction steps for laying Bituminous concrete.

b) Explain briefly the importance and requirements of Highway Drainage.   [5+5]

OR

11.a) Discuss the desirable properties of Coarse Aggregates. List the various laboratory test conducted to find these properties.

b) Explain how the soils are classified based on HRB soil classification system.   [5+5]

---ooOoo---

Code No: RT31015   **R13**   **SET - 1**

III B. Tech I Semester Supplementary Examinations, May - 2019
TRANSPORTATION ENGINEERING – I
(Civil Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

~~~~~~

PART –A

1	a)	What are the different Road Network Patterns available?	[4M]
	b)	Define Stopping Sight Distance. Derive an expression for SSD on level road.	[4M]
	c)	What are the Factors affecting capacity of a highway? Discuss briefly.	[4M]
	d)	What is Group Index of a soil?	[4M]
	e)	What are the different layers of a Flexible Pavement? Indicate through a diagram.	[3M]
	f)	What is rutting of a Flexible Pavement? Why it occurs?	[3M]

PART -B

2	a)	What are the most important events in the chronological history of the Development of Highways in India? Elaborate.	[8M]
	b)	What are the salient features of Bombay Road Development Plan? How it differs from Nagpur Plan?	[8M]
3	a)	What are the objectives of providing Transition curves? What are the methods used for computing the length of Transition curve?	[8M]
	b)	On a level terrain, a horizontal curve is to be provided on a highway of 7.0 m width. But due to the topographical constraints, the speed can not be more than 45 kmph at the location and the rate of super elevation is limited to 0.04. Compute the radius to be adopted. Also compute the extra widening and the length of transition curve, if the super elevation is to be provided longitudinally at the rate of 1 in 100 and the pavement is rotated about inner edge. Take the wheel base of vehicle as 6.0 m. Assume any other data, if required, suitably.	[8M]
4	a)	What are the objectives of Speed Studies? How the Speed Data is presented by various statistical methods?	[10M]
	b)	Explain about the classification of Traffic Signs.	[6M]
5	a)	What are the desirable Properties of Road aggregates? Explain.	[8M]
	b)	With the help of a neat diagram, explain the procedure of Softening Point Test on bitumen.	[8M]
6	a)	What are the differences between Flexible and Rigid Pavements?	[6M]
	b)	Explain about the different types of stresses that need to be considered in Rigid Pavements.	[10M]
7	a)	What is alternate bay method of construction of CC Pavement?	[8M]
	b)	What are the failures of Rigid Pavements? Explain.	[8M]

Code No: RT31015   **R13**   SET - 1

III B. Tech I Semester Supplementary Examinations, October/November - 2019
TRANSPORTATION ENGINEERING – I
(Civil Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

~~~~~~~~~~~~~~~~~~~~~

PART –A   (22 Marks)

1	a)	What are the requirements of good highway alignment? Briefly discuss.	[4M]
	b)	What is extra widening on a horizontal curve? Why it is needed?	[4M]
	c)	What are the types of Road Signs? Discuss briefly.	[4M]
	d)	Define Flakiness Index of an aggregate group. How it is useful?	[3M]
	e)	What are the differences between Flexible and Rigid Pavements?	[4M]
	f)	What is alligator cracking in Flexible Pavements? Why it occurs?	[3M]

PART –B   (48 Marks)

2	a)	What are the salient features of Nagpur Road Development Plan? Explain.	[8M]
	b)	What are obligatory points? How they influence highway alignment?	[8M]
3	a)	Why super elevation is needed on a horizontal curve? What are the methods of providing super elevation? Explain.	[8M]
	b)	The design speed of a highway is 80 kmph. There is a horizontal curve of radius 90 m on a certain locality. Calculate the rate of super elevation needed to maintain the design speed. If the maximum rate of super elevation of 0.07 is not to be exceeded, calculate the maximum allowable speed on the curve as radius cannot be increased. Safe limit of transverse coefficient of friction is 0.15.	[8M]
4	a)	What are the objectives of Traffic Volume Studies? How the Traffic Volume Data is presented by various methods?	[8M]
	b)	Explain about the classification of Traffic Signs and their specifications.	[8M]
5	a)	With the help of a neat diagram, explain the procedure of Impact Testing on Road aggregate.	[8M]
	b)	What is Ductility of bitumen? How it is tested?	[8M]
6	a)	Explain the CBR Method of design of Flexible Pavements.	[8M]
	b)	Explain about the different types of stresses and combination of stresses in Rigid Pavements.	[8M]
7	a)	What is the method of construction of WBM Road? Explain.	[8M]
	b)	What are the failures of Flexible Pavements? Explain.	[8M]

*****

Code No: RT31015   **R13**   **SET - 1**

III B. Tech I Semester Supplementary Examinations, October/November-2020
TRANSPORTATION ENGINEERING – I
(Civil Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
        2. Answering the question in **Part-A** is compulsory
        3. Answer any **THREE** Questions from **Part-B**

~~~~~~

PART –A   (22 Marks)

1. a) Explain the functional classification of highways.   [3M]
   b) Describe the factors that can influence a camber.   [4M]
   c) Differentiate the time mean speed and space mean speed.   [4M]
   d) What are the properties to be tested on road aggregates for deciding the suitability in construction?   [4M]
   e) What is the role of base course and sub base courses in flexible pavements?   [4M]
   f) What is Mud pumping?   [3M]

PART –B   (48 Marks)

2. a) What are the various road patterns practiced? Explain.   [8M]
   b) Explain the role of engineering surveys in finalizing highway alignment.   [8M]

3. a) Design a transition curve for a circular curve having a radius of 300 m in a plain terrain. It is proposed to introduce the super elevation in the 4 lane National highway having a width of 14m by rotating the alignment with reference to central line. The design speed of highway is 120 kmph. The rate of introduction of super elevation is 1 in 150.   [8M]
   b) What are the various gradients used in highways? What do you understand by Grade compensation?   [8M]

4. a) What are the objectives of traffic volume studies and discuss about the role of 30th hourly volume?   [8M]
   b) What are the advantages of channelization in highways and also explain the salient features of a clover leaf intersection.   [8M]

5. a) What is the difference between Cutback and Emulsion? Discuss about the tests to be organized for deciding the suitability of Bitumen in road construction.   [8M]
   b) Explain the CBR test.   [8M]

6. a) Explain the concept used in Bur mister two layered system.   [8M]
   b) Compute the wheel load stresses as per IRC standards for a rigid pavement having a thickness of 20 cm and for a design load of 5800 kg on a sub grade soil having modulus of sub grade reaction as 6.8 kg/cm^3. Assume the modulus of elasticity of concrete as 3×10^5 kg/cm^2 and Poisons' ratio as 0.15. The radius of load contact area may be taken as 18 cm.   [8M]

7. a) What are the various types of maintenances carried in pavements? Explain.   [8M]
   b) Explain the construction procedure of CC pavements.   [8M]

*****

CBCS SCHEME

USN [| | | | | | | | |] 21CV52

Fifth Semester B.E. Degree Examination, Dec.2023/Jan.2024
Transportation Engineering

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1. a. Explain the importance of transportation. Write the advantages and disadvantages of different modes of transportation. (10 Marks)
   b. Explain interpretation of planning survey. Briefly explain Vision 2021. (10 Marks)

OR

2. a. Explain Engineering Surveys. (10 Marks)
   b. Explain briefly various stages of work in new highway project. (10 Marks)

Module-2

3. a. A state highway passing through a rolling terrain has a horizontal curve of radius equal to ruling minimum radius. Design all geometric features of horizontal curve, assuming suitable data. (12 Marks)
   b. With a neat sketch briefly explain about camber and width of carriage way. (08 Marks)

OR

4. a. Find safe overtaking sight distance for design speed 96 kmph, acceleration of overtaking vehicle 1.92 kmph/sec, draw neat sketch of overtaking zone (minimum). (10 Marks)
   b. Write the difference between flexible pavement and rigid pavement. (10 Marks)

Module-3

5. a. Explain the properties of aggregates and tests to be conducted on aggregates. (10 Marks)
   b. CBR tests were conducted on two specimens of a soil. Determine CBR value of the soil, if 100 divisions of load dial represents 190kg load in the calibration chart of the proving ring.

Penetration of plunger, mm	Load dial reading, divisions	
	Specimen 1	Specimen 2
0.0	0	0
0.5	8	0.5
1.0	15	1.5
1.5	23	2.5
2.0	29	6.0
2.5	34	13
3.0	37	20
4.0	43	30
5.0	48	38
7.5	57	50
10.0	63	58
12.5	67	63
.	.	.

(10 Marks)

1 of 2

21CV52

OR

6 a. Explain the design elements of highway embankment. (10 Marks)
   b. Explain in brief the specification of material and construction steps of WMM layer. (10 Marks)

Module-4

7 a. With a neat sketch, explain the procedure for design of filter material in highway drainage. (10 Marks)
   b. Explain in brief three methods of economic evaluation of highway projects. (10 Marks)

OR

8 a. Explain in briefly highway user benefits and Vehicle Operation Cost (VOC). (10 Marks)
   b. Write note on BOT and BOOT. (10 Marks)

Module-5

9 a. Explain about traffic regulation and controls. (10 Marks)
   b. Define the term "Runway Orientation". Explain about any one type of wind rose diagram. (10 Marks)

OR

10 a. Explain briefly functions of sleepers and ballast. (10 Marks)
   b. Explain factors affecting selection of sites for an airport. (10 Marks)

* * * * *

III B. Tech I Semester Supplementary Examinations, June/July-2022
TRANSPORTATION ENGINEERING – II
(Civil Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

~~~~~~

PART –A   (14 Marks)

1.	a)	List component of Permanent Way.	[2M]
	b)	What is Degree of Curve?	[2M]
	c)	Draw a neat diagram of Scissor Crossing.	[2M]
	d)	What is Wind rose diagram?	[3M]
	e)	List the design factors of Airfield Pavement.	[3M]
	f)	What is the purpose of Transition Sheds?	[2M]

PART –B   (56 Marks)

2.	a)	Explain the functions of Sleepers.	[7M]
	b)	Discuss the Adzing of Sleepers.	[7M]
3.	a)	Discuss about Grade Compensation.	[7M]
	b)	Explain the extra clearance on curves.	[7M]
4.	a)	Compare Mechanical and Electrical Signaling System.	[7M]
	b)	Discuss about Interlocking of Signals.	[7M]
5.	a)	Explain the characteristics of Aircraft.	[7M]
	b)	Discuss about Airport Lighting.	[7M]
6.	a)	Discuss LCN system of pavement design.	[7M]
	b)	Explain the procedure to evaluate airfield pavements.	[7M]
7.	a)	Discuss about the Break Water.	[7M]
	b)	Explain about navigational aids.	[7M]

*****

1 of 1

III B. Tech I Semester Supplementary Examinations, August-2021
TRANSPORTATION ENGINEERING - II
(Civil Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
       2. Answer **ALL** the question in **Part-A**
       3. Answer any **FOUR** Questions from **Part-B**
~~~~~~

PART –A   (14 Marks)

1. a) What is Cant Gradient?   [2M]
   b) State any four ideal requirements of a permanent way.   [3M]
   c) Why the removal of obstructions surrounding airport sites is   [3M]
      absolutely necessary?
   d) Enumerate the classification of airports and their functional   [2M]
      requirements.
   e) Distinguish between quays and jetties.   [2M]
   f) What is the classification of navigational aids in a harbor?   [2M]

PART –B   (56 Marks)

2. a) Briefly explain the modern methods of surveys for track alignment.   [7M]
   b) What is the necessity of geometric design of a railway track?   [7M]
      Enumerate the significant features of design of a railway track.

3. a) Write a detailed note on semaphore signal with a neat sketch.   [7M]
   b) Draw a neat labeled layout of a Diamond crossing and scissors cross   [7M]
      over and explain briefly.

4. a) Explain any four methods adopted to control movements of a train   [7M]
      and compare their merits.
   b) Explain various methods to reduce creep on railway track.   [7M]

5. a) Write short notes on: i) Holding apron; ii) Approach Zone.   [10M]
   b) Differentiate Nose-in parking and nose-out parking.   [4M]

6. a) State the characteristics of air transport, which make the air traffic   [7M]
      control a complex one. Summarize the primary functions of air traffic
      control devices.
   b) Explain with neat sketches any four types of navigational aids in a   [7M]
      harbor and state their functions.

7. a) Describe with neat sketches the effect of waves on coastal structures.   [7M]
   b) Explain wet docks with neat sketches.   [7M]

*****