



**APJ ABDULKALAM TECHNOLOGICAL UNIVERSITY
08 PALAKKAD CLUSTER**

Q. P. Code : TE0820301-I

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Name:

Reg. No:.....

THIRD SEMESTER M.TECH. DEGREE EXAMINATION FEBRUARY 2021

Branch: Civil Engineering

Specialization: Transportation Engineering

08CE7201 HIGHWAY GEOMETRIC DESIGN

(Common to TE)

Time: 2 hour 15 minutes

Max. Marks: 60

Answer all six questions.

Modules 1 to 6: Part 'a' of each question is compulsory and answer either part 'b' or part 'c' of each question.

(Use of design tables is permitted)

Q. No.	Module 1	Marks
1.a	Highway design is based on specified design standards and controls that depend on the roadway system factors. What are the factors?	3
	Answer b or c	
b	Prepare the camber boards for the parabolic camber for WBM major district roads in areas of heavy rainfall	6
c	Explain the terms i) Operational speed ii) Design speed and iii) Running speed.	6
Q. No.	Module 2	Marks
2.a	What are the advantages of Bernoulli's Lemniscates curve over the spiral curve?	3
	Answer b or c	
b	How much should be the outer edges of the pavement be raised w.r.t the central line on a two lane road designed to cater for mixed traffic at a speed of 65kmph on a horizontal curve of radius 160m, if i) the pavement is rotated w.r.t the central line and ii) the pavement is rotated w.r.t to the inner edge.	6
c	How to measure sight distance over horizontal curve in the field?	6

Q. No.	Module 3	Marks
3.a	What are the criteria for selecting shape of summit curves?	3
Answer b or c		
b	A rising gradient of 1 in 25 meets a falling gradient of 1 in 50 on NH. Design a vertical curve if the existing features near the locality permit the adoption of only minimum sight distance.	6
c	If a stopping sight distance of 400 ft. is to be maintained on a sag vertical curve with tangent grades of -3% and 0%, what should the length of the curve be? Assume a headlight beam upward divergence angle of 1°.	6
Q. No.	Module 4	Marks
4.a	Explain primary and secondary task measurement for driver workload evaluation?	3
Answer b or c		
b	Describe the different consistency evaluation measures in detail.	6
c	Explain the alignment indices for evaluating the consistency of highway.	6
Q. No.	Module 5	Marks
5.a	Define Neck down and Chicanes.	4
Answer b or c		
b	What are the deficiencies of multi – leg intersections? Using a suitable diagram show how you would correct these deficiencies.	8
c	What are the key defining characteristics of rotary that distinguish them from other traffic circles?	8
Q. No.	Module 6	Marks
6.a	Briefly explain the importance of road delineators.	4
Answer b or c		
b	Explain layout of parking lots and garages and what are the factors affecting selection of best parking layout?	8
c	What are the various design principle for pedestrian facilities in urban roads?	8