B. E. CIVIL ENGINEERING 3RD YEAR 1ST SEMESTER SUPPLEMENTARY EXAMINATION
2018
TRANSPORTATION ENGINEERING – I

Time: 3 Hours

Full Marks: 100

Part I

(60 marks for THIS part)

Use Separate Answer scripts for each Part

Answer Question No 1 and any TWO questions from the rest

1. Answer the following –   9+8+9+4
   a. Name and Explain the different types of raised up structures placed on the carriageway
   b. Explain Exceptional Gradient and Minimum Longitudinal Gradient with their significance
   c. State how are the information about following characteristics used in geometric design of highways – height of a vehicle, road surface glare and fatigue of user
   d. What is the compensated grade when a 200m radius curve is to be set in a +4.5% grade?

2. Determine the desirable length of overtaking zone for a 4-lane 2-way undivided highway with design speed of 80kmpH, reaction time = 2sec, maximum speed of overtaken vehicle = 64KmpH, and acceleration of overtaking vehicle = 3.6KmpH/sec. How and by how much this length of overtaking zone can be decreased without changing any design vehicular characteristics   7+3

3. Determine the safe stopping sight distance for a single lane two-way minor district road with design speed of 40kmpH, reaction time = 2.5secs, coefficient of braking friction = 0.37, braking efficiency = 90% and longitudinal slope of 4%   5

4. A horizontal curve is to be designed for a 4-lane 2-way divided highway catering mixed traffic with average wheel base length of 5m. Design the safe radius for a design speed of 60kmpH checking only against super elevation (maximum permissible super elevation and coefficient of lateral friction are 7% and 0.15 respectively). Also design the required extra width and transition length if the super elevation is provided by rotating about centre line at a rate of 1 in 125.
   The highway runs on ground level with 0.5m wide side drain and 3m wide shoulder on both sides. The design SSD and OSD are 90m and 165m respectively. Find the minimum distance required between edges of side drains and building line if i) overtaking is allowed in the curve and ii) not allowed in the curve.   9+6

B.E. CIVIL ENGINEERING THIRD YEAR
FIRST SEMESTER SUPPLEMENTARY EXAM 2018
(1st /2nd Semester/Repeat/Supplementary /Spl. Supplementary /Old/Annual/Bi-Annual)
SUBJECT: TRANSPORTATION ENGINEERING I
(Name in full)
PAPER ××××

Time: Two hours/ Three hours/Four hours/Six hours   Full Marks 30/100

(45/40 marks for this part)

Use a separate Answer-Script for each part

No. of Question			Marks

Part – II

- *Maintain neatness.* Do not retain mobile to avoid RA
- *Assume reasonable data if it is not supplied.*
- *Answer any two questions.*
- All drawings-must be drawn by pencil
- No code etc. will be needed/ supplied to answer the questions of this part

(1)(a) What is "gauge"? What is "wheel gauge"?   2 + 2
  or
  What are factors governing choice of gauge of a proposed railway track?   4

(b) Draw an ideal permanent way and label it properly.   6
  or
  How adzing of sleepers, tilting of rails and coning of wheels help to provide the thread   6
  of wheels in absolutely dead centre position on the head of the rails? Take the help
  of neat sketch if required.

(c) Give the "tree structured "classification of wears on rails. What measures may be   3+7=10
  adopted to minimize the wears on rails?

(2)(a) Among concrete sleeper and metal sleeper which one is more preferable and why?   8
(b) Give the 'tree-structured presentation' of classification of sleepers.   3
(c) Using a sleeper density of "M+5", find out the number of sleepers required for   4
  constructing a rail track 640m long. The track is B.G. track and is made up of welded
  rails (where two B.G. rails are welded together throughout 640m length).
(d) What are the governing factors to fix the sleeper density?   2
(e) Is there any situation where railway track may be laid without the aid of sleepers? If 3
  so, mention about such situation/s.

(3)(a) What special measures should be taken for maintenance of high speed track?   9
(b) Why maintenance of railway track is needed?   3
(c) How followings play important roles for a good & safe rail permanent way: 4×2=8
  (i) Proper packing of ballast, (ii) High level integrity of ballast and (iii) Minimum depth
  of ballast section, (iv) Gradient

End of Questions