

7E1812	Roll No. _____	[Total No. of Pages : 2]
	7E1812 B.Tech. VII-Sem. (Main) Examination, December - 2023 Civil Engineering 7CE4-01 Transportation Engineering	

Time : 3 Hours

Maximum Marks : 70

Instructions to Candidates:

*Attempt all ten questions from Part A, five questions out of Seven questions from Part B and three questions out of five questions from Part C
Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.
Use of following supporting material is permitted during examination. (Mentioned in form No. 205).*

PART - A

(Answer Should be given upto 25 words only)

All questions are compulsory.

(10×2=20)

1. Define alignment in brief.
2. Name different types of road pattern in India.
3. Define camber of road.
4. List out different types of gradients.
5. Define Flakiness index and Elongation index.
6. What is PQC and DLC?
7. What is embankment?
8. What is Roller compacted concrete road?
9. Name the components of Permanent way.
10. What is breakwater?

PART-B**(Analytical/Problem solving questions)****Attempt any Five questions.****(5×4=20)**

1. What are the requirements of ideal highway alignment. Also explain factors controlling the alignment?
2. Calculate OSD for a two-way Highway Having design speed of 80 Kmph and acceleration is 0.69 m/s^2 Assume any data if required.
3. Discuss superelevation of highway with neat diagram. Also prove that $e + f = \frac{v^2}{gR}$.
4. What are the desirable properties of aggregate. Also explain the test to determine hardness of aggregate?
5. Explain difference between Rigid and flexible pavement in tabular form. Draw neat diagram also.
6. Define Permanent Way with neat sketch. Describe requirements of an ideal permanent way.
7. What are the factors to be considered while selection of site for airport?

PART - C**(Descriptive/Analytical/Problem Solving/Design questions)****Attempt any Three questions.****(3×10=30)**

1. The radius of a horizontal curve is 200m, the total pavement width at curve is 7.0m and superelevation is 7%. Design the transition curve length for a speed of 100 kmph. Assume pavement to be rotated about the inner edges. Also calculate the shift of the curve. Assume any data if required.
2. Explain steps involve in highway construction. What are the Equipments used in compaction of different layers of pavements? Explain in detail.
3. Explain Asphalt Hot mix plant with its control panel, components, layout and working in detail.
4. Define Harbour. Explain requirements of good harbour. Describe classification of harbours.
5. Write short Notes on
 - a) Runway
 - b) Terminal Building
 - c) Apron
 - d) Taxiway
 - e) Hanger

7E1712	Roll No. _____	[Total No. of Pages : 2]
	<div style="border: 1px solid black; display: inline-block; padding: 2px 10px; margin: 5px;">7E1712</div> <p>B.Tech. VII-Sem. (Back) Examination, December - 2023 Civil Engg. 7CE4-01 Transportation Engineering</p>	

Time : 3 Hours

Maximum Marks : 120

Min. Passing Marks : 42

Instructions to Candidates:

Attempt all **ten** questions from Part A, **five** questions out of **seven** from Part B, and four questions out of **five** from Part C

(Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A

(Answer should be given up to 25 words only)

All questions are compulsory.**(10×2=20)**

1. What are the different modes of transportation? (2)
2. What are the uses of map study in engineering survey for new highway project? (2)
3. Differentiate in between abrasion and attrition. (2)
4. Explain camber. What are the objectives of camber? (2)
5. List out different types of road rollers used in road construction work. (2)
6. Define flexible and rigid pavements and bring out point of difference. (2)
7. Define gradient and also list out of various categories of gradient. (2)
8. Name the different types of rail gauges used in railway. (2)
9. Define runway length of airport. (2)
10. What is the difference in between port and harbors? (2)

PART-B

(Analytical/Problem Solving questions)

Attempt any Five questions.**(5×8=40)**

1. Explain briefly the recommendations of Jayakar Committee. (8)
2. Describe the salient features of Bombay Road Plan. (8)
3. Define alignment. Mention the factors affecting the road alignment. (8)
4. Write short notes on the followings: (4 × 2 =8)
 - i) Traffic separators
 - ii) Shoulders

- iii) Transition curve
- iv) Super elevation

5. The speed of overtaking and overtaken vehicles are 70 and 40 kmph respectively on a two way traffic road. If the acceleration of overtaking vehicle is 0.99 m/sec^2 . (8)

- i) Calculate safe over taking sight distance
- ii) Mention the minimum length and desirable length of overtaking zone
- iii) Draw a neat sketch of the overtaking zone and show the positions of the sign posts.

Take the total reaction time 2.5 Seconds and the coefficient of friction as 0.35.

6. Explain the relative merits and demerits of different type of sleepers. (8)
7. Explain classification of harbours and ports in detail. (8)

PART - C

(Descriptive/Analytical/Problem Solving/ Design questions) (4×15=60)

Attempt Any Four Questions.

1. a) List out the desirable properties of road aggregates. Explain any one laboratory test of road aggregates with the help of neat diagram. (8)
- b) Discuss the desirable properties of bitumen. Compare bitumen and tar. (7)
2. a) What do you understand by flexible pavement? Explain any one design method for flexible pavement. (8)
- b) Draw a neat sketch of cross section of flexible pavement and show the components parts and also discuss the function and importance of each component of the pavement. (7)
3. a) Write down the construction steps for water bound macadam (WBM) road. (7)
- b) The radius of a horizontal curve is 100 m. the design speed is 50 kmph and the design coefficient of friction is 0.15. (8)
- i) Calculate the superelevation required, if full lateral friction is assumed to develop
 - ii) Calculate the coefficient of friction needed, if no superelevation is provided.
 - iii) Calculate the equilibrium superelevation, if the pressure on inner and outer wheels should be equal.
4. a) Write short notes on the followings: (2× 4 = 8)
- i) Ballast Material
 - ii) Rail Fastenings
- b) Explain various components of harbours in detail (7)
5. a) Explain the various factors which influence the airport site selection. (8)
- b) Explain classification of the airports in detail. (7)

7E7065

Roll No. _____

[Total No. of Pages : 2]

7E7065

B.Tech. VII - Sem. (Back) Examination, January- 2024
Civil Engineering
7CE5A Application of Numerical Methods in Civil Engg.

Time : 3 Hours**Maximum Marks : 80**
Min. Passing Marks : 24**Instructions to Candidates:**

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No.205).

Unit - I

1. a) Explain various types of errors with suitable examples. (8)
- b) Convert $(11100011)_2$ to the corresponding decimal number system. (8)

(OR)

1. Explain the Taylor's theorem and derive General formula for errors using the Taylor's theorem. (16)

Unit - II

2. Find a root of the equation $xe^x - \cos x = 0$ in the interval (0,1) using Regula falsi method correct to four decimal places. (16)

(OR)

2. Find a real root of $x^4 - x - 10 = 0$ using Newton's method. (16)

Unit - III

3. Solve the following system of equations.

$$5x + 3y + 7z = 4$$

$$3x + 26y + 2z = 9$$

$$7x + 2y + 10z = 5$$

(16)

(OR)

3. Use Gaussian elimination method to solve the system of linear equations.

$$2y + z = -8$$

$$x - 2y - 3z = 0$$

$$-x + y + 2z = 3$$

(16)

Unit - IV

4. Solve the following by Gauss - Seidel method.

$$20x + y - 2z = 17$$

$$3x + 20y - z = -18$$

$$2x - 3y + 20z = 25$$

(16)

(OR)

4. Solve the system of equations by using Cholesky method.

$$x + 2y + 3z = 5$$

$$2x + 8y + 22z = 6$$

$$3x + 22y + 82z = -10$$

(16)

Unit - V

5. Find the value of y at x = 4, if the following values of x and y are given.

x	0	2	3	6
y	-4	2	14	158

(16)

(OR)

5. Find y at x = 25, 73.

(16)

x	10	20	30	40	50	60	70	80
y	0.9848	0.9397	0.8660	0.7660	0.6428	0.50	0.3420	0.1737