



## Transportation Engineering - I (1040)

P. Pages : 2

Time : Three Hours

Max. Marks : 100

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Answer sheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Attempt **all five** questions.
5. Attempt **any two** bit out of a, b, c from each unit.
6. Neat diagrams must be drawn wherever necessary.
7. Figure to right indicate full marks.

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| 1. a) i) Define permanent way. Give component parts & explain the requirements of an ideal permanent way. | 5  |
| ii) Explain different types of steel rails.   | 5  |
| b) i) Explain functions of ballast & what are the requirements of an ideal ballast material.              | 5  |
| ii) What are the different materials used as ballast.   | 5  |
| c) What are the functions of sleepers what are the types of sleepers & write a note on concrete sleepers. | 10 |
| 2. a) i) Explain types of gradients.  | 5  |
| ii) Write a note on super - elevation. Explain factors affecting super - elevation.                       | 5  |
| b) i) State different methods of plate laying. Explain any one.   | 5  |
| ii) Explain requirement of an ideal track alignment.  | 5  |

- c) i) Explain grade compensation on curves. 5
- ii) A 6° curve branches off from 3 degrees main curve in an opposite direction in the layout of a B.G. yard. If the speed on branch line is restricted to 35 kmph, determine the speed restriction on the main line. Assume permissible deficiency in cant as 75 mm. 5
3. a) i) What is crossings. Explain types of crossings. 5
- ii) Write a note on scissors cross - overs. 5
- b) i) What are objects of signaling. List the types of signals. 5
- ii) Write a note on automatic signaling. 5
- c) Define interlocking. Explain principles of interlocking what are the methods of interlocking & explain any one method. 10
4. a) i) What is tunnel. What are different method of tunneling for soft ground. Explain any one method. 5
- ii) Explain objects of tunnel lining. What are different materials used for tunnel living. 5
- b) Write a note on drainage & ventilation of a tunnel. 10
- c) i) What is mucking ? How it is carry out. 5
- ii) What are the advantages of constructing shafts in tunnel work. 5
5. a) What are the factors Governing the choice of site for a harbour & give classification of harbours. 10
- b) i) Write a note on light house. 5
- ii) Write a note on floating dock. 5
- c) What is breakwaters. Give classification of breakwaters. Explain any one type. 10

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