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Name.......................................

Reg. No....................................

SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, DECEMBER 2007

CE 04 605—TRANSPORTATION ENGINEERING—II

(2004 Admissions)

Time : Three Hours   Maximum : 100 Marks

*Answer **all** questions.*

1. (a) Define the gauge of a railway track. Enumerate different gauges used in India and discuss their suitability at different locations with reasons. Why uniformity of gauges is desirable in any country ?

   (b) Discuss the factors on which sleeper density depends and how the sleeper density is expressed ? If the BG tank is laid for 2 km length with sleeper density of $n+5$ find the number of sleepers required.

   (c) Define interlocking and explain the principles of interlocking. Describe the various mechanical devices used for interlocking.

   (d) Explain the working principles of Absolute Block systems.

   (e) Explain the various design considerations for a harbour.

   (f) Explain the modern methods of track maintenance.

   (g) Write a short notes on Tunnel ventilation.

   (h) Explain the economic evaluation by annual cost, benefit cost ratio methods.

                                                                        $(8 \times 5 = 40$ marks$)$

2. (a) Explain the following :—

   (i) Coning of wheels.

   (ii) Creep.

   (iii) Components of permanent way and their function.

   (iv) Material assessment for unit length of track.

   (v) Safe speed on curves.

Or

   (b) Write short notes on :

   (i) Cant deficiency and negative cant.

   (ii) Transition curves.

Turn over

(iii) Grade compensation on curves.

(iv) Widening of gauge on curve.

(v) Safe speed on curves.

(15 marks)

3. (a) (i) Explain different types of signals used in the station yards.

(5 marks)

(ii) Explain :

1 Working principles of centralised traffic control system.

2 Standard method of relaying track.

(2 × 5 = 10 marks)

Or

(b) (i) Explain the procedure of tunnelling in hard rock.

(7½ marks)

(ii) Tunnel lighting, ventilation and drainage.

(7½ marks)

4. (a) Write short notes on :

(i) Classification of harbours and ports.

(ii) Wet and dry docks.

(iii) Lock and lock gates.

(iv) Breakwaters.

(v) Fenders and Dolphins.

(15 marks)

Or

(b) Write short notes on :

(i) Quays and piers.

(ii) Breakwater construction.

(iii) Transit shed and warehouse.

(iv) Navigational aids.

(v) Site selection for harbour.

(15 marks)

5. (a) Explain :

(i) Inter modal coordinates.

(ii) Ts and automated Highways.

(iii) Salient features of 4th road development plan in India.

(15 marks)

Or

(c) Write a note on economics of highway pavement.   (7½ marks)

(d) The details of three alternate proposals for strengthening of highway pavement are given below. Determine which one is more economical, if its rate of interest payable is also the cases is 12% per annum and three are average 3,500 motor vehicles per day, with annual growth rate of 6.5%.

Sl. No.	Overlay Type	Design life (years)	Construction cost Rs. Lakhs per km	Maintenance cost Rs. per km	Vehicle operating cost Rs. Veh.km
1 ...	WBH + PMC	5	15.00	25,000	6.00
2 ...	BM + PMC	8	20.00	20,000	5.75
3 ...	BM + AC	12	25.00	10,000	5.00

(7½ marks)

[4 × 15 = 60 marks]