Con. 6897 - 13. **LJ-11326**

(3 Hours) **[Total Marks : 100**

N.B. : (1) Question **1** is **compulsory.**
(2) Attempt any **four** out of **remaining six** questions.
(3) Assume suitable data wherever necessary.

1. Solve any **four** :-
   (a) What is gauge ? What are the different types of gauges provided in India. **5**
   (b) Explain with sketch coning of wheel and tilting of rail. **5**
   (c) Draw and explain the wind rose diagram (any one type). **5**
   (d) Explain the various survey to be conducted for airport site selection. **5**
   (e) Draw a labelled neat sketch of an artificial harbour. **5**

2. (a) Calculate all the necessary elements required to set out 1 in 8.5 turnout, taking of from a straight B.G. track with its curve starting from the toe of the switch i.e. tangential to the gauge face of the outer main rail and passes through thearetical nose of crossings. Heel divergence (d) = 11.4 cms. **10**
   (b) What is meant by 'creep of rails.' Explain the wave action theory and percussion theory of creep. **6**
   (c) Explain working of semaphore signals. **4**

3. (a) A 5^0 branch curve diverge out from a 2^0 main curve in apposite direction of the meter gauge track. If the speed is restricted to 30 km/hr on main line and cant deficiency permissible is 5.1 cm what, would be the speed limit on branch line. **10**
   (b) What is meant by marshalling yard ? Draw the neat sketch of the typical marshalling yard. Name the various parts. Also explain different types of marshalling yards. **10**

4. (a) The length of a runway under standard condition is 2200 metres. The airport is to be provided at elevation of 410 m above MSL. The airport reference temperature is 32^0C. The construction plan provides the following data : **10**

End to end of runway in metres	**Grade (Percent)**
0 to 300	+ 1.00
300 to 900	– 0.50
900 to 1500	+ 0.50
1500 to 1800	+ 1.00
1800 to 2100	– 0.50
2100 to 2700	– 0.40
2700 to 3000	– 0.10

TURN OVER

Determine the length of runway by applying the requisite corrections for elevation, termperature and gradient.

(b) Draw a neat sketch of 'Left hand turnout' and name the various elements of it. **5**

(c) What do you meant by Negative cant. Explain with sketch. **5**

5. (a) A taxiway is to be designed for a aparting breing 707-320 having following characteristics, determine the turning radius of taxiway. **7**

Wheel base = 17.60 m

Tread of main londer gear = 6.60 m

Turning speed = 38 km/hr

coefficient Friction between

tire and pavement surface = 0.13

(b) List the factors to be considered while selecting the site for harbour. **5**

(c) Explain the term holding apron and hanger with sketch. **8**

6. (a) Explain the working of 'Interlocking of Signals' in railways. **5**

(b) Explain the types of cargo handling equipment at port. **5**

(c) Differentiate between following :- **10**

(i) Jetty and Fender

(ii) Flexible and Rigid dolphines.

7. Write short notes on (any **four**) :- **20**

(a) Diamond Crossing.

(b) Sleeper density

(c) CST-9 sleeper

(d) Instrumental landing system

(e) Airport drainage system
