



- Notes :
1. All questions carry equal marks.
 2. Answer **three** questions from Section A and **three** questions from Section B.
 3. Due credit will be given to neatness and adequate dimensions.
 4. Assume suitable data wherever necessary.

SECTION – A

1. a) Enumerate and explain the various resistances offered to movement of a train. **6**
b) Calculate the maximum permissible train load a locomotive can pull on a horizontal level track with a speed of 80kmph. The locomotive has 3 pair of driving wheels carrying 20 tonnes each. **7**
If the train has a climb a gradient of 1 in 400. Calculate the speed reduction.
2. a) What is meant by can't Deficiency. **3**
b) A 8° curve diverges from a 5° main curve in the reverse direction in the layout of a B.G.- Yard. If the restricted speed on branch line is 35kmph, find the speed on main line. **10**
3. a) Discuss the requirement and effect of "Coning of wheel" in a railway track. **6**
b) What do you understand by permanent way? What are the requirements of an ideal permanent way. **7**
4. a) Draw a neat sketch of a left hand turnout and show various component part on it. **6**
b) Determine all the necessary elements required to set out a 1 in 16 turnout taking off from straight B.G. Track with its curve starting from the toe of switch and passes from T.N.C., the heel divergence $d = 11.4\text{cm}$. **7**
5. Write short notes on **any four**. **14**
 - a) Throw of switch.
 - b) Semaphore signal
 - c) Ballast
 - d) Gauges
 - e) Creep of rail
 - f) Sleepers

SECTION – B

6. a) Discuss the various factory that are important in the selection of a suitable site for an airport. **7**
b) Discuss the important characteristics of Aircraft from the point of view of a civil engineer. **6**
7. a) The runway length required for landing at sea level in standard atmospheric condition is 3000 m Runway length required for take off at a level site at sea level in standard atmospheric condition is 2500m. Aerodrome reference temperature is 25°C and that of standard atmosphere at aerodrome elevation of 150m is 14.025°C If the effective runway gradient is 0.5% determine runway length. **8**

- b) What do you understand by terminal area, what facilities are provided in this area. 5
8. a) Explain the necessity of airport lighting? 5
- b) What are the different systems of aircraft parking? Explain the suitability of each system. 8
9. a) State various methods of tunneling in soft ground and explain in detail any one of them. 7
- b) Explain tunnel ventilation objects and discuss its requirements in ventilating system. 6
10. Write short notes on **any four**. 14
- a) Tunnel lining. b) Economics of tunneling.
- c) Tunnel drainage. d) Hanger.
- d) Exit Taxiway.
