

2 Attempt any **four** parts of the following : **5×4=20**

- a) How do you define the super-elevation? What are the objects of providing super-elevation on curves of a railway track.
- b) What is meant by crossing? What are the essential requirements of a good crossing?
- c) What do you understand by “Negative Super elevation”? Explain.
- d) What should be the equilibrium cant on a MG curve of four degrees for an average speed of 66 kmph? Also find out the maximum permissible speed after allowing the maximum cant deficiency.
- e) What are the basic requirements of good alignment? Discuss in detail.

3 Attempt any **two** parts of the following : **10×2=20**

- a) What are the functions of a railway station? Discuss the various requirements of a railway station.
- b) How signals are classified? Explain with neat sketches the working of the semaphore signals.
- c) What is the necessity of relaying a track? Describe the standard method of relaying the track in India. Also discuss the various considerations.

4 Attempt any **two** parts of the following : **10×2=20**

- a) What do you understand by the term basic runway length? Explain the procedure of determining the actual runway length required at particular site.

- b) Explain the various factors which affect the location of exit taxiway. What do you understand by optimum location of exit taxiway?
- c) Draw a neat sketch to show how lighting is done on a runway. Adopt narrow gauge pattern of lighting. What are the advantages of this pattern ?

5 Attempt any **two** parts of the following : **10×2=20**

- a) What is the role of following processes in harbour layout and suggest remedies (i) wind waves (ii) tidal currents (iii) Littoral drift (iv) Siltation and Erosion.
- b) What is the purpose of navigation aids? What are the various types of aids used on shore at sea.
- c) What are the artificial blocks used as armours?
Explain :
 - i) Tetrapod
 - ii) Tribar
 - iii) DolosAlso write a short note on vertical breakwater.
