Sub Code: RCE076

Paper Id: 100746 Roll No: | | | | | | | | | | | | | |

BTECH
(SEM VII) THEORY EXAMINATION 2019-20
RAILWAYS, AIRPORT & WATERWAYS

Time: 3 Hours *Total Marks: 70*

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2 x 7 = 14**

a.	Determine the optimum thickness of the stone ballast required below sleepers of density M + 7 and width 250mm on a BG track.
b.	Find the steepest gradient on a 2° curve for a BG line with a ruling gradient of 1 in 200.
c.	Find out the number of sleepers required for constructing a B.G track 963metres long, adopting sleeper density as n+6.
d.	Define the equilibrium speed and cant deficiency.
e.	What do you mean by a Junction Station?
f.	What are the application of wind rose diagram?
g.	What do you understand by the term Dry Dock?

SECTION B

2. Attempt any *three* of the following: **7 x 3 = 21**

a.	What are the functions of rails? Compare the various types of rails.
b.	What do you mean by coning of wheels? Discuss
c.	Explain the concept of negative superelevation.
d.	Draw a neat sketch to show how lighting is done on runway. Adopt narrow gauge pattern of lighting. What are the advantages of this pattern?
e.	What factors are taken into consideration for design of a port?

SECTION C

3. Attempt any *one* part of the following: **7 x 1 = 7**

(a)	What are the functions of the ballast in a railway track?
(b)	Discuss the various types of sleepers used on Indian Railways. Which one would you consider to be the best for modern tracks and why?

4. Attempt any *one* part of the following: **7 x 1 = 7**

(a)	What is creep? Discuss the theories propounded for the probable causes of creep.
(b)	A 5° curve diverges from a 3° main curve in the reverse direction in the layout of a broad gauge yard. If the speed on the branch line is restricted to 35 km/h, Determine the restricted speed on the main line.

5. Attempt any *one* part of the following: **7 x 1 = 7**

(a)	How are signals classified? Mention the functions of each signals
(b)	Calculate the maximum permissible load that a BG 2-6-2 locomotive bearing an axle load of 22 t each can pull on a straight level track at a speed of 80 km/h. Also calculate the reduction in speed if the train has to run on a rising gradient of 1 in 200. What would be the further reduction in speed if the train has to negotiate a 4° curve on the rising gradient? Assume the coefficient of friction to be 0.2.

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6. **Attempt any *one* part of the following:** 7 x 1 = 7

(a)	Assess the various aircraft characteristics affecting the planning and design of airport.
(b)	The runway length required for landing at sea level in standard atmospheric condition is 3300m.Runway length required for takeoff at a level site at sea level in standard atmospheric condition is 2300m.Aerodrome reference temperature is 23°C and that of the standard atmosphere at aerodrome elevation at 180m is 15.025°C.If the effective runway gradient is 0.55%, determine the runway length to be provided.

7. **Attempt any *one* part of the following:** 7 x 1 = 7

(a)	Discuss the inland water transportation development in India .Also discuss the advantages and disadvantages of inland transportation.
(b)	Briefly describe the different navigational aids in harbor engineering