

MANIPAL INSTITUTE OF TECHNOLOGY MANIPAL

A Constituent Institution of Manipal University

VI SEMESTER B.TECH. (CIVIL ENGINEERING) END SEMESTER EXAMINATIONS, APR/MAY 2017

SUBJECT: RAILWAY ENGINEERING AND AIRPORT PLANNING

[CIE 3203]

REVISED CREDIT SYSTEM (20/06/2017)

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

- ✤ Answer ANY FIVE FULL questions.
- ✤ Missing data may be suitable assumed.

Q No.	Question	Marks
1A.	Explain with a neat sketch the following theories of creep a) Wave theory b) Percussion theory	3
1B.	b) A 5 ^o curve diverges from a 3 ^o main curve in the layout of a B.G. yard. If the speed of the branch line is restricted to 35kmph, find out the maximum permissible speed on the main line. Maximum cant deficiency is allowed.	3
1C.	Draw a typical cross section of a permanent way single lane in cutting on a curve. Discuss in brief the requirement of a good ballast.	4
2A.	Calculate the maximum permissible train load that can be pulled by a locomotive having four pairs of driving wheels carrying an axle load of 22tonnes each. The train has to run at a speed of 90kmph on a straight level track (B.G.) Also calculate the speed reduction if the train has to climb a 1 in 175 gradient	4
2B.	Explain the Route relay system of Railway working. Mention the advantages of the system.	3
2C.	Derive a relation between Super-elevation, Gauge, Speed & Radius of the Curve	3
3A.	What is grade compensation on curves? If the ruling gradient is 1 in 150 on a B.G. track with a curve of 4^0 is situated on this, what should be the allowable ruling gradient.	3
3B.	Explain how jet blast and fuel spillage will affect Airport system.	2
3C.	The runway length required for landing at MSL in standard atmospheric condition is 2750m. Reference temperature of the Aerodrome is 25 ^o c and standard atmospheric temperature at elevation of 140m is 15 ^o c. Also, runway length required for takeoff at MSL is 2425m. If the effective runway	5

4A.

4B.

4C.

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	gradient is 0.45%, determine the runway length to be provided.			
۹.	With a neat sketch explain how minimum turning radius can be determined.	3		
3.	Calculate the turning radius of the taxiway for a subsonic aircraft with a wheel base of 28m and tread of main gear as 6.2m, for a turning speed of 55kmph. Assume coefficient of friction as 0.15 and width of taxiway pavement for Type 'A' airports.	3		
С.	With a neat diagram explain the 3 controls of an Aircraft.	4		
Δ.	Draw a typical cross section of an ILS Runway showing the safety area and	2		

5A.	Gradients.	Z
5B.	With a neat diagram explain the Wind rose diagram of Type-I.	4
5C.	Explain the different components of ILS.	4
