

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination (Regular), April-May 2018

B. Tech in Civil Engineering, Semester VI

Roll No.....

CE611 : Transportation Engineering-II

Time: 3 hours

Max. Marks: 100

Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.
3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.

Q.1A Objective type multiple choice questions (10 questions @ 1 mark)

10

- i. The railway station at which a track line meets a main line is called:
(a) terminal station (b) flag station
(c) way side station (d) junction station
- ii. In locomotive 'hunting' is:
(a) Movement of locomotive in vertical plane perpendicular to its movement along the track
(b) Sinuous path taken by engine as against the alignment of the track
(c) Motion after brakes have been applied
(d) Combination of A and B above
- iii. Generally the shape of fish plate is:
(a) elliptical (b) bone shaped
(c) circular (d) rectangular
- iv. The art of providing an outward slope of.... to the treads of wheels of rolling stock is known as coning of wheels.
(a) 1 in 30 (b) 1 in 10
(c) 1 in 4 (d) 1 in 20
- v. The tractive resistance of the route in railways as compared to roadways will be:
(a) same (b) more
(c) low (d) not comparable
- vi. Cant deficiency occurs when a vehicle travels around a curve at
(a) Equilibrium speed
(b) Speeds higher than equilibrium speed
(c) Speeds lower than equilibrium speed
(d) Booked speed
- vii. The most common system of signaling in India is the system.
(a) automatic block (b) section clear system
(c) absolute block (d) pilot guard system

viii Wing loading of an aircraft is

(a) load of the wings

(c) $\frac{\text{Gross total weight of the aircraft}}{\text{wing area}}$

(b) $\frac{\text{Gross total weight of the aircraft}}{\text{load of wings}}$

(d) $\frac{\text{Gross total weight of the aircraft}}{\text{total available H.P. of engine}}$

ix Pick up the correct statement from the following

(a) Landing speed is directly proportional to the wing loading

(b) wing loading remaining constant, the takeoff distance is directly proportional to the powder loading

(c) Neither (a) nor (b)

(d) Both (a) nor (b)

x Pick up the correct statement from the following:

(a) F.I.R. stands for flight information regions

(b) F.I.C. stands for flight information centre

(c) Radius of control area is 160 km

(d) Radius of control zone is 40 km

(e) all the above

Q.2 Short answer type questions (4 questions @ 2.5 marks)

10

i. Where are repeater signals provided?

ii. What do you mean by basic runway length?

iii. What is creep? How it can be prevented?

iv. Explain the function and working of a floating dry dock.

Q.3A Draw & explain typical cross-section of a permanent way on embankment.

05

Describe the requirements of an ideal permanent way.

Q.3B What do you understand by adzing of sleepers? What is the desirable qualities or requirements of good sleepers? A B.G. track has a sleeper density of $n+6$. If the track is laid with welded rails of 26 m length. Find out the number of sleepers required for a railway track of 1690 m.

05

Q.4A Derive the slope equation for summit curve with neat sketch.

05

Q.4B Draw a neat sketch of a right hand turn out on a BG track showing on the salient feature.

05

Q.5A Calculate the element to set out a turnout taking from a straight BG track. The curve is starting from toe of switch and ends at TNC.

05

Number of crossing = 1 in 20

Heel divergence = 18.0 cm

Show the value in figure.

Q.5B Write a short note:(any three)

05

(a) Holding apron

(b) Designation of locomotive

(c) Hauling capacity

- (d) Coning of Wheels
- (e) Negative Superelevation with sketch

Q.6A Define cant and cant deficiency. Calculate the length of transition curve for a B.G. track having 5° deflection and a cant of 14 cm. The max-permissible speed on the curve track is 50 Kmph. 05

Q.6B Design a diamond crossing for two BG tracks crossing at each other at an angle 1 in 20. 05

OR

Q.6B Enumerates the various types of track junction in use. Discuss the suitability of each under different conditions. 05

Q.7A Why it is preferred for landing and taking-off of aircrafts to take place against the direction of wind? 05

Q.7B Determine the min. theoretical length of LWR beyond which the central portion of a 52 Kg rail could not be subjected to longitudinal movement due to 30° C temperature variation use following data: 05

(i) about rail

c/s Area = 66.15 cm^2

$E_s = 2.1 \times 10^6 \text{ kg/cm}^2$

$\alpha = 11.5 \times 10^{-6} / ^\circ\text{C}$

(ii) sleeper

c/c spacing = 60 cm

Avg. resistance by one sleeper / rail = 300kg

OR

Q.7B A summit curve is formed by two gradient (+ 4 % meeting a down gradient of (-) 0.8%) of a point of chainage 2800 m and R.L. of 280 m. Calculate the length of summit curve and find out Reduce level of each point on the curve if rate of change of gradient per chain length (30 m) is 0.6%. 05

Q.8A State the engineering principal of signaling and give a broad classification of signals of signals used in Indian railway. What are the systems used for controlling train movement? 10

Q.9A What is the role of following processes in harbour layout and suggest remedies 10

(i) wind waves

(ii) tidal currents

(iii) Littoral drift

(iv) Siltation and Erosion.

Q.9B Calculate max speed allowed on a track with following feature of location of curve 10

a) Degree of curve = 1°

b) max cant provided = 13 cm

c) max cant deficiency = 10 cm

d) length of transition = 115cm

e) maximum sanction speed by railway = 150 Kmph
OR

10

- Q.9B Sketch a typical layout of an airport and define
- (a) basic runway length
 - (b) width of landing strip
 - (c) length of landing strip
 - (d) transverse gradient in a runway