Enrollment No: _____ Exam Seat No: _____

C.U. SHAH UNIVERSITY
WinterExamination-2018

Subject Name: Railway, Bridge and Tunnel Engineering

Subject Code: 4TE06RBT1 **Branch: B.Tech (Civil)**

Semester: 6 **Date: 01/11/2018** **Time: 02:30 To 05:30** **Marks: 70**

Instructions:
(1) Use of Programmable calculator & any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat diagrams and figures (if necessary) at right places.
(4) Assume suitable data if needed.

Q-1 **Attempt the following questions** **(14)**

a) What is nominal size of ballast used for point and crossing? (1)
b) Draw a neat sketch of Jack arch flooring. (1)
c) Enlist the methods of tunneling in Rock. (1)
d) What is the purpose of providing point and crossing? (1)
e) What is Uniformity of gauge? (1)
f) For broad gauge route with M+7 sleeper density, number of sleepers per rail length is…… (1)
g) What is tunnel lining? (1)
h) Define Shaft and Portal. (1)
i) Enlist the methods which are applied to work out the safe bearing capacity of an existing bridge. (1)
j) What is meant by wear of rail? (1)
k) What is the main function of fish plate? (1)
l) What are the different types of light which are in common use in tunneling work? (1)
m) Define depth of ballast. (1)
n) Define abutments. (1)

Attempt any four questions from Q-2 to Q-8

Q-2 **Attempt all questions** **(14)**

A) Give a detailed description of the forepoling method of tunneling. Sketch and explain the sequence of operations. **(7)**

B) State different types of surveys conducted before fixing railway alignment. Explain any two. **(7)**

Q-3 **Attempt all questions** **(14)**

A) What are the facility requirements of a railway station? Classify the railway stations. **(7)**

Draw a neat sketch of layout of any one type of station.

B) Discuss with sketches: (i) Erection of steel arch bridge, (ii) Maintenance of bridges. **(7)**

Q-4 **Attempt all questions** **(14)**

A) Briefly explain different types of gradients used in railway. What is grade compensation? Compute the same for horizontal curve of 3° on B.G. track having ruling gradient of 1:200. **(7)**

B) Describe the ways of providing effective drainage during and after the construction of tunnel. **(7)**

Q-5 **Attempt all questions** **(14)**

A) Compare the characteristics of wooden sleepers and reinforced concrete sleepers used on Indian Railways. **(7)**

B) Explain with formulae for the bridges: Design discharge, Linear water way, Afflux, Scour depth, Economical span. **(7)**

Q-6 **Attempt all questions** **(14)**

A) What are the functions of rails? Explain the various types of rails in use. **(7)**

B) Write short notes on the following: **(7)**

1) Bridge Investigation.
2) Shape and size of tunnel.

Q-7 **Attempt all questions** **(14)**

A) Classify the bridges according to their super structure's load taking behaviour. Draw a detailed sketch of plan and cross section of bridge showing its all components. **(7)**

B) What are the objectives of signaling and interlocking in railway? Discuss with sketches different types of signals used in railway. **(7)**

Q-8 **Attempt all questions** **(14)**

A) Explain the conning of wheels with neat sketch **(4)**

B) What are the effects of creep of rails? **(3)**

C) Explain the following in connection with tunnel construction: **(7)**

1) Safety measures
2) Health protection