Student Exam No_____

GANPAT UNIVERSITY
B.TECH- SEMESTER-VII CIVIL ENGINEERING
REGULAR EXAMINATION DEC- 2013
SUBJECT: 2CI: 803- HIGHWAY & TRAFFIC ENGINEERING

Time: 3 Hours **Max Marks: 70**

Instructions:

(1) Answer to the two sections must be written in separate answer books.

(2) Figures to the right indicate full marks.

(3) Assume suitable data if required (only if not provided).

SECTION-I

Q. 1 Answer the following objectives. **(12)**

(A) What is the Full form of ESAL?

(B) The PCU value for Vehicles with Low speed & Large Area is less; is this statement True?

(C) The maximum gradient permitted by IRC for Vertical Alignment for 100 Kmph Speed is _____.

(D) State the formula to calculate Vertical Curve Length, when the length of Curve required is Greater than Stopping Distance_____.

(E) The SSD for Single Lane road with two way traffic is given by _____.

(F) Design should be based on OSD; is this Statement True?

(G) The Maximum Super Elevation for Hilly Road is?

(H) The pavement Design Method as per IRC 37:2001 is Empirical Method, Is the Statement True?

(I) The Highway Alignment should be A. Short B. Curved C. Economical D. All of these

(J) For Hilly Roads the Main Design Element is _____.

(K) Vehicular Underpass and Flyover are one and same term, is this Statement True?

(L) The Bridge which can be raised for passage of Cargo Vessel is termed as

OR

Q. 1 Answer the following questions. (12)

(A) Draw Cross Section for Two Lane Road in Urban Section at Grade Separated Location.

(B) Find out the Safe Stopping Distance, Intermediate Sight Distance, Horizontal Curve Radius required for Design Speed of 100 Kmph.

Q. 2 Answer the following questions.

(A) Explain various types of failures in Rigid Pavement. **(6)**

(B) Explain with sketches the functioning of joints filler and sealer. **(5)**

Q. 3 Answer the following (Any Four) (12)

(A) What are the various factors to be considered in pavement design? Discuss the significance of each?

(B) Explain Equivalent Single Wheel Load and the concept in the determination of the Equivalent Wheel Load.

(C) Calculate the Traffic Index value for 10 year period using the following data. Assume 7.5% increase/year in traffic volume for 10 years.

No of Axles	ADT (both direction)
2	700
3	300
4	100
5	2

(D) Find out the radius of relative stiffness & radius of resisting section for the Given Data.

$h = 25cm$, $a=16$ cm, $\mu=0.15$, $K=3.0$ Kg/cm^3, $E=3X10^5$ kg/cm^2

(E) For a C.C pavement having expansion joint of gap 2.5 cm, temperature differential 44°c calculate the spacing between expansions joint.

Take $\alpha=10X10\text{-}6/°c$.

SECTION-II

Q. 4 Answer the following (Any Two) (12)

(A) Explain the Flexible Pavement Distress with sketch.

(B) Existing black top pavement was tested using Benkelman Beam with a test vehicle of 8170 Kg. rear axle load. Observations recorded at a pavement temperature of 40° C are given below, Length of test stretch = 300 m, Compute the thickness of overlay of bituminous concrete, taking allowable deflection as 1.25mm, if the factor for subgrade moisture correction is 3.0

Deflection readings are : 1.46,1.52,1.56,1.76,1.97,1.74,1.68,1.74,1.96,1.42,1.56 & 1.62.

(C) Define AADT, ADT, CBR, and Radius of Resisting Section.

Q. 5 Answer the following (Any Two)

(A) State the difference between Bitumen & Tar. (6)

(B) State the various tests performed on Soil Subgrade. (5)

Q. 6 Answer the following (Any Three) (12)

(A) Write a note on selection of Alignment

(B) State the various stages and their output for a Highway Project

(C) State the various Traffic Signs, Marking and state their importance.

(D) Define Speed, Flow, Level of service, PCU.

(E) Explain the difference between Flexible & Rigid Pavement.

(F) State the different stabilization techniques.

END OF THE PAPER