GANPAT UNIVERSITY
B.TECH.SEM.VII.CIVIL ENGINEERING
REGULAR EXAMINATION NOV/DEC-2012
C-703 HIGHWAY AND TRAFFIC ENGINEERING

TIME:-3 HOURS   **TOTAL 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.

Section-1

Que-1

(a) Describe '1961-81 road Plan' with its salient features.   4

(b) Explain transition curves on the horizontal alignment highways.   4

(c) Explain summit and valley curve and the various cases when these are formed while two different gradients meet.   4

OR

Que-1

(a) What are the principles and necessity of highway planning?   4

(b) Draw a cross-section of road structure showing its components and functions of each.   4

(c) Give the necessity of the following on road.   4
   (i) camber
   (ii) Sight distance
   (iii) Super elevation
   (iv) Extra widening on horizontal curve.

Que-2

(a) Give advantages and disadvantages of cement concrete roads.   4

(b) Determine the spacing between contraction joints for 3.7 meter slab width having thickness of 22 cm and f = 1.7 for the following two cases ;   3
   (i) for plain cement concrete, allowable S_c = 0.9 kg/cm^2
   (ii) for reinforcement cement concrete, 1.0 cm dia. bars at 0.30 m spacing.
   Assume unit weight of CC = 2400 kg/m^3 and allowable tensile stress in steel = 1400 kg/cm^2

(c) Design the pavement section by triaxial test method using the following data: 4
   Wheel load = 4100 kg
   Radius of contact area = 15 cm
   Traffic coefficient, X = 1.5
   Rainfall coefficient Y = 0.9
   Design deflection Δ = 0.25 cm
   E-value of subgrade soil E_s = 100 kg/cm^2
   E- value of 7.5 cm thick bituminous concrete surface course = 1000 kg/cm^2

OR

Que-2

(a) Describe the function of various pavement components.   4

(b) Discuss the critical combination of stresses due to wheel load and temperature effects.   3

(c) A National highway passing through rolling terrain in heavy rainfall area has a horizontal curve of radius 550 m. design the length of transition curve assuming suitable data.   4

Que-3

(a) Explain extra widening on horizontal curves.   4

(b) Enumerate the steps for practical design of super elevation.   4

(c) Determine the total width of a pavement on a horizontal curve for a new national highway to be aligned along a rolling terrain with ruling minimum radius. Assume suitable data.   4

Section-II

Que-4

(a) Describe the maintenance of bituminous roads.   4

(b) Explain one-way streets? Mention their advantages and disadvantages.   4

(c) Explain the method of construction of cement concrete slab.   4

OR

Que-4

(a) Explain the various types of failures in cement concrete pavements and their causes.   4

(b) Explain following term: 4
   a. Highway Capacity,
   b. Basic Capacity,
   c. Possible Capacity and
   d. Practical Capacity

(c) Explain the different types of joints in cement concrete road.   4

Que-5

(a) Explain classification of bridges.   4

(b) Discuss the treatment of road in water-logged areas.   3

(c) List various low cost roads. Explain the construction of WBM roads.   4

OR

Que-5

(a) Give the important of hill road.   3

(b) Enumerate advantages and disadvantages of WBM roads.   4

(c) What data should be collected while location of any bridge site?   4

Que-6

(a) Discuss various stages of bridge investigation.   4

(b) Enumerate various deficiencies in cement concrete pavements.   4

(c) State and explain types of overlays.   4

"END OF PAPER"