Diploma in Civil Engineering

Term-End Examination

June, 2007

BCE-036 : SOIL, ROADS AND AIRFIELDS

Time : 2 hours *Maximum Marks : 70*

Note : *Attempt **five** questions in all. Question no. 1 is **compulsory**. Attempt any **four** questions from the remaining questions. Use of calculator is allowed. Graph papers are to be supplied on request.*

1. Fill in the blanks : *2×7=14*

(i) The Standard Proctor Test is used to determine _____ .

(ii) Void Ratio is defined as the ratio of the volume of _____ to the volume of _____ .

(iii) Boundary water contents at which the soil undergoes change from one state to another are called _____ .

(iv) Rudder is utilised for _____ or _____ movement of the aircraft.

(v) Critical Temperature value for Asphaltic Concrete is _____ .

(vi) The camber provided in gravel roads may range between _____ to _____ .

(vii) Runway is usually oriented in the direction of prevailing _____ .

2. The porosity of a sand sample is 0·6. Assuming a specific gravity of 2·68, compute void ratio (e), dry unit weight (γ_d), moist unit weight (γ_m) at 80% saturation. Unit weight of water may be taken as 9·81 kN/m^3. *4+5+5=14*

3. Define Liquid Limit (LL). How do you determine Liquid Limit in laboratory ? Explain the method with the help of flow curve and neat figure of apparatus used. *2+3+5+4=14*

4. (a) What is mastic asphalt ? Explain prime coat. Why is tack coat provided ? *1+2+2=5*

(b) What do you understand by Planning Survey ? Explain in brief its two components namely collection of economic and demographic data and Traffic Survey. *1+3+3=7*

(c) Explain the advantages of photogrammetry in Highway location and design. *2*

5. (a) Write down the equipment used for earthwork in road construction for the following : *2×4=8*

(i) Levelling of original ground

(ii) Excavation and Haulage

(iii) Spreading in layers

(iv) Compaction

(b) Explain mechanical and lime soil stabilisation. *3+3=6*

6. What are the various types of road constructions ? Explain the construction procedure for Earth Roads. *5+9=14*

7. Explain the nature of defects and their remedial measures encountered during the maintenance of Flexible and Rigid Pavements. *7+7=14*

8. (a) Which all corrections are applied while planning and designing a runway ? Explain each of them. *8*

(b) Coarse aggregate, fine aggregate and fillers are combined in the proportion of 65 : 25 : 8 to produce dense bituminous concrete. The specific gravity of the material is 2·52, 2·75 and 2·68 respectively. Determine the average specific gravity of the mixed aggregate. *6*