Diploma in Civil Engineering / Diploma in Electrical & Mechanical Engineering

Term-End Examination

June, 2006

BCE-044 : CONCRETE TECHNOLOGY

Time : 2 hours *Maximum Marks : 70*

Note : *Answer any **five** questions including Q. no. 1 which is **compulsory**.*

1. (a) Answer any ***two*** of the following in brief (2 – 3 lines only) $2\times2=4$

(i) Give the weight and volume of one bag of cement.

(ii) Give the function of ribs present on steel bars.

(iii) How does the presence of gypsum in cement affect its setting time ?

(b) Fill in the blanks (any ***four***) $4\times1\frac{1}{2}=6$

(i) Special ingredients added in the concrete during mixing, to improve certain properties of concrete are called _____ .

(ii) The type of cement used for mass-concreting is _____ .

(iii) Le-Chatelier Apparatus is used to determine _____ of cement.

(iv) The property of concrete representing "the resistance to disintegration under the environmental forces" is called _____ .

(v) The final operation of finishing the concrete is called _____ .

(c) Select the correct option (any ***four***) $4\times1=4$

(i) Among the main cement compounds, $C_3S/C_4AF/C_3A$ is comparatively inactive.

(ii) Rodding and Ramming are the operations related with curing/finishing/compaction of concrete.

(iii) Compaction factor test is used to determine workability/compressive strength/tensile strength of concrete.

(iv) Workability of concrete mix is more with angular/rounded/flaky aggregates.

(v) Road Note No. 4 is the method of designing the road/designing the concrete mix/designing the R.C.C. members.

2. (a) Differentiate between any ***two*** of the following : $2\times4=8$

(i) Segregation and Bleeding of concrete

(ii) Flaky and Elongated aggregates

(iii) Function of Construction joint and Expansion joint

(b) Give the effects of the following on the strength of concrete : $3 \times 2 = 6$

(i) Water – Cement ratio

(ii) Degree of compaction

(iii) Age of concrete

3. (a) Define initial setting time and final setting time of cement. Describe the procedure of determining the initial setting time of cement in the laboratory. $4+6=10$

(b) Give the specific application of the following types of cement : $2 \times 2 = 4$

(i) Expanding cement

(ii) White and Coloured cement

4. (a) Define hardness and toughness of aggregates. Describe in brief the procedure for determining the aggregate crushing value. $4+5=9$

(b) With the help of grading curve, discuss the gap-graded aggregates. 5

5. (a) Define the workability of concrete. Describe the slump-test in detail. $2+5=7$

(b) Discuss the importance of quality of water used for preparation of concrete. List the various types of impurities likely to be present in water. $3+4=7$

6. (a) Describe the weigh-batching and volume-batching of aggregates and discuss their relative merits and demerits. $4+3=7$

(b) Give the advantages of mechanical compaction over the hand compaction of concrete. List the different types of vibrators used for compaction of concrete. $5+2=7$

7. Write short notes on any ***four*** of the following : $4\times3\frac{1}{2}=14$

(a) Elongation index

(b) SSD condition of aggregates

(c) Membrane curing of concrete

(d) Voids-method of mix design

(e) Pre-stressed concrete

(f) Ready-mixed concrete (RMC)