

**B.Tech Odd Semester (CBCS) Exam.,
December—2016**

AGRICULTURAL ENGINEERING

(7th Semester)

Course No. : AE-702

(**Building Materials and Structural Design**)

Full Marks : 75

Pass Marks : 30

Time : 3 hours

- Note :
1. Attempt **one** question from each Unit.
 2. Begin each answer in a new page.
 3. Answer parts of a question at a place.
 4. Assume reasonable data wherever required.
 5. The figures in the margin indicate full marks for the questions.

UNIT—1

1. (a) Write a short note on fineness modulus of aggregates. 5
- (b) With the help of a flowchart, outline the procedure for manufacture of cement. 5
- (c) State the quick test to check the presence of clay and organic matter in sand. 5

2. (a) Briefly describe different types of lime. 5
- (b) Enumerate the properties of a good brick. 5
- (c) Write a note on hydration of cement. 5

UNIT—2

3. (a) Define the structure of wood with neat diagram. 10
- (b) Discuss the factors affecting strength of timber. 5
4. What do you mean by seasoning? What are the factors affecting quality of wood? 15

UNIT—3

5. (a) What is shear force? Explain with neat diagram. 5
- (b) Explain the following : 10
 - (i) Balanced section
 - (ii) Compression member
 - (iii) Uniformly distributed load
 - (iv) Point moment
 - (v) Cantilever beam

(3)

6. (a) Define the types of structure in building construction with neat diagrams. 10
- (b) Define the terms 'under-reinforced section' and 'over-reinforced section'. 5

UNIT—4

7. (a) Work out the economical diameter and depth of a silo to store sufficient quantity of silage for a herd of 400 dairy cows having an average body weight of 450 kg each. The cows are fed silage for 200 days in a year. 10
- (b) Briefly explain the types of dairy barn. 5
8. (a) Briefly describe about the wire floored poultry house and deep litter poultry house along with schematic diagrams. 10
- (b) Write a short note on stanchion barn along with diagram. 5

UNIT—5

9. (a) Calculate the quantity of earthwork for 200 m length for a portion of a road in a uniform ground with the heights of banks at the ends being 1 m and 1.6 m. The formation width is 10 m and side

(4)

- slope is 2 : 1. Assume that there is no transverse slope and use
- (i) mid-sectional area method, 10
- (ii) mean-sectional area method and
- (iii) prismatic area method.
- (b) Describe different types of farm fencing in a nutshell. 5
10. (a) Estimate the cost of fencing of a square farm of 25 hectares fenced by barbed wire using cement concrete posts, assuming 1.8 m high angle iron posts spaced 3 m apart with 6 lines of barbed wires. Also, assume the following : 10
- (i) Cost of post @ ₹ 70 per post
- (ii) Cost of four corners posts @ ₹ 125 per post
- (iii) Cost of barbed wire @ ₹ 250 per 100 m
- (iv) Cost of earthwork @ ₹ 2 per pit
- (v) Cost of cement concrete @ ₹ 10 per pit
- (vi) Labour charge ₹ 2000
- (b) Enumerate the special features of reinforced cement concrete posts. 5
