B.Tech Even Semester Examination, May, 2025

Agricultural Engineering

(8th Semester)

Course No: AE-E02

(Building Materials and Structural Design)

Full Marks: 50

Pass Marks: 25

Time: 2 hours

Note:

1. Attempt any five questions.
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 figure in the right margin indicates full marks for the question
6. All the mathematical symbols and abbreviations have their usual meanings.

1. a) With the help of a flowchart, outline the procedure for cement manufacture. 6

   b) Write a note on Sand and its type. 4

2. a) State the quick test to check the presence of clay and organic matter in sand. 6

   b) Enumerate the properties of a good brick. 4

3. a) Write down the types of dairy barns and explain briefly. 5

   b) Define the types of Poultry structures. 5

4. a) Briefly describe the types of concrete. 5

   b) Discuss the factors affecting the strength of timber. 5

5. (a) Draw a neat, labelled diagram of wood and define it in detail. 6

   (b) Solve the following with a diagram:

   (i)A cantilever beam of 2 m length carries a UDL of 3 kN/m. Calculate the reaction forces and moment at the fixed end.

   (ii) A fixed beam of span 6 m carries a uniformly distributed load of 4 kN/m.

   Find the degree of indeterminacy. Uniformly distributed load. 4

6. (a) Write down the difference between determinate and indeterminate structures. 6

   (b) Explain the different types of bins with neat diagrams. 4

7. A vertical silo stores wheat to a height of 12 meters.The internal diameter of the silo is 4 meters.The unit weight (bulk density) of wheat is 750 kg/m^3.The coefficient of friction between the wall and wheat is ì = 0.4.The angle of internal friction of wheat is ö = 28°.Using Airy's theory, calculate:

   (a) The horizontal pressure at the base of the silo.

   (b) The vertical pressure at the base of the silo. (6+4)

8. a) Explain the different types of dairy barns in brief. 4

   b) Write down the fundamental requirements for a poultry house. 6

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