Roll No: | | | | | | | | | | |

# The Assam Royal Global University, Guwahati

**Royal School of Engineering & Technology**

**B Tech (Civil Engineering) 7th Semester**

**Special Supplementary Examination, August 2024**

**Course Title: Engineering Economics, Estimation & Costing**

**Course Code: CEE022C703**

**Time: 3 Hours** **Maximum Marks: 70**

**Note: Attempt all questions as per instructions given.**

*The figures in the right-hand margin indicate marks.*

## Section – A

1. Attempt **all questions**. (Maximum word limit 50) **2 x 8**

   a. Find the volume of three bags of cement.
   b. Calculate the number of standard modular bricks required for 5 $m^3$ of masonry.
   c. Define depreciation.
   d. Explain supplementary estimate.
   e. Write down the importance of specification in building estimate.
   f. Define rate analysis.
   g. What is estimation?
   h. How would you find overhead cost?

## Section – B

2. Attempt **any one** of the following: **12 x 1**

   a. Find quantities of the following items of work. Figure 1 shows a room of internal dimensions 4.m x 2.5 m.
      i) Earthwork in excavation in foundation.
      ii) Cement Concrete in foundation.
      iii) Ist class brickwork in 1:4 cement mortar in foundation and plinth.
      iv) 2.5 cm thick DPC work.
      v) Brickwork in superstructure in 1: 5 cement mortar.

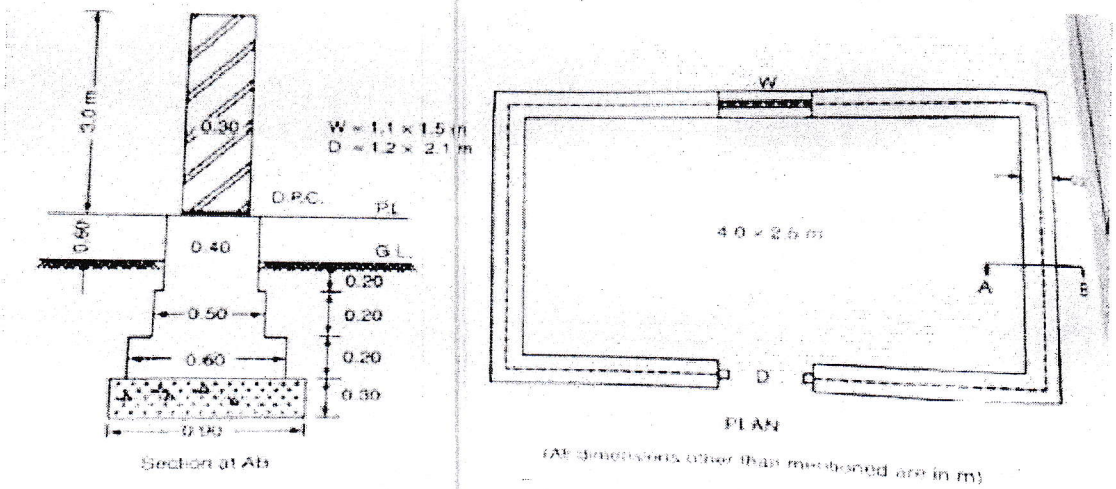


Figure 1

b. Calculate the volume of earthwork for a portion of road 400 m length from the following data. The formation width of the road is 15 m. Side slopes are 3:1 in banking and 2: 1 in cutting. Also draw the Longitudinal section and cross section of the road.

| Station | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Distance in meter | 1000 | 1040 | 1080 | 1120 | 1160 | 1200 | 1240 | 1280 | 1320 | 1360 | 1400 |
| RL of Ground | 51 | 50.9 | 50.5 | 50.8 | 50.6 | 50.7 | 51.2 | 51.4 | 51.3 | 51 | 50.6 |
| RL of Formation | 52 | Downward gradient of 1 in 200 | | | | | | | | | |

3. Attempt **any two** of the following: **7 x 2**

a. Find out the estimate of a building project with a total plinth area of all buildings of 2200 sq.m from the following data:

(i) Plinth area rate- Rs. 6500/- per sq.m
(ii) Extra for special Architectural treatment- 1.5% of the Building Cost.
(iii)Extra for Water supply and Sanitary Installations (6%)- 5% of the building cost.
(iv) Extra for internal installations 12% of the building cost
(v)Extra for other services- 6% of the building cost.
(vi) Contingencies - 4%.
(vi) Supervision charges - 8%.

b. Explain the mid sectional Area method for estimating earthwork in Road estimate.

c. Explain the Constant percentage method and sinking fund method to calculate depreciation.

4. Attempt **any two** of the following: **7 x 2**

a. Analyse the rate for 2nd class brickwork in superstructure with 250 x 125 x 125 mm (Nominal size) bricks with 1: 5 cement sand mortar for one cubic metre. Rates as given below:

i. Cement = ₹ 460 / bag
ii. Sand = ₹ 1300 per cum
iii. Bricks 2nd class = ₹ 12 per piece
iv. Head mason = ₹ 900
v. Mason = ₹ 700
vi. Mazdoor= ₹ 500/day
vii. Bhisti= ₹ 450/day.

b. The owner of a building gets a net annual rent of ₹ 3,500. The future life of the building is estimated to be 12 years. But if the recommended repairs are carried out immediately at an estimated cost of ₹30,000, it is expected to last for at least 30 years.

Assuming the rate of interest as 8%, determine whether it is economical to carry out the recommended repairs to the building or leave it as it is.

c. Explain the Prismoidal formula method for earthwork in road estimating.

5. Attempt **any two** of the following: **7 x 2**

a. Illustrate the importance of Schedule of Rates.

b. List the factors to be considered while preparing rate analysis.

c. Discuss the detailed specifications of earthwork in excavation of foundation.