# ELIZADE UNIVERSITY

*Pragmatic Innovation for Development*

## FACULTY: ENGINEERING
## DEPARTMENT: CIVIL ENGINEERING
## FIRST SEMESTER EXAMINATION (MARCH 2017)
## 2016/2017 ACADEMIC SESSION

**Course Title: Civil Engineering Practice**

**Course Code: CVE 401**

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HOD'S SIGNATURE

**Instructions:**

1) **Attempt any four Questions**

2) **Time Allowed: 3 hours**

3) **SEVERE PENALTIES APPLY FOR MISCONDUCT, CHEATING, POSSESSION OF UNAUTHORIZED MATERIALS DURING EXAM**

## ELIZADE UNIVERSITY, ILARA – MOKIN
## FACULTY OF ENGINEERING
## DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING
### First Semester 2016/2017 Session

**Course Title: Civil Engineering Practice**     **Course Code: CVE 401**     **Units: 3**

**Instruction: Attempt any four Questions**     **Time Allowed: 3 hours**

### Question 1 (15 marks)

Elizade Construction Company is undertaking a project whose activity, activity predecessors and estimated duration is as shown in Table Q1. Based on the data provided undertaken the following.

(i)     Draw the Critical Path Diagram (5 marks).
(ii)    Calculate the ES, EF, LS, LF duration for the project. (5 marks)
(iii)   What is the total time required to complete the project if no delays occur? (3 marks)
(iv)    When do the individual activities need to start and finish (at the latest) to meet this project completion time?(2 marks)

Table Q1: Activity List for Elizade Construction Company Project

| Activity | Activity Description | Immediate Predecessors | Estimated Duration |
|---|---|---|---|
| A | Excavate | - | 2 weeks |
| B | Lay the foundation | A | 4 weeks |
| C | Put up the rough wall | B | 10 weeks |
| D | Put up the roof | C | 6 weeks |
| E | Install the exterior Plumbing | C | 4 weeks |
| F | Install the interior Plumbing | E | 5 weeks |
| G | Put up the exterior sliding | D | 7 weeks |
| H | Do the exterior painting | E, G | 9 weeks |
| I | Do the electrical work | C | 7 weeks |
| J | Put up the wallboard | F, I | 8 weeks |
| K | Install the flooring | J | 4 weeks |
| L | Do the interior painting | J | 5 weeks |
| M | Install the exterior fixtures | H | 2 weeks |
| N | Install the interior fixtures | K, L | 6 weeks |

### Question 2 (15 marks)

List and briefly describe the documents making up a construction contract. (15 marks).

### Question 3 (15 marks)

A plot of land of 0.96 ha in area is being prepared for a developmental project. Linear survey measurements of the area have been conducted and the results of the survey are as follows: A (0,0); B (15,0); C (30,0); D(45,0); E (60,0); F (0,20); G (15,20); H (30,20); I (45,20); J (60,20); K (0,40); L (15,40); M (30,40); N (45,40); O (60,40); P

(0,60); Q (15,60); R (30,60); S (45,60); T (60,60); U (0,80); V (15,80); W (30,80); X (45,80) and Y (60,80). Prepare a bold, neat sketch of the plot showing the dimensions with the scale.

## Question 4 (15 marks)

The figures Question 3 above in the parenthesis are the coordinates in meters, with elevations of these points from A to Y are 5.00; 4.78, 4.50, 5.00, 5.00, 3.50, 3.73, 3.80, 4.00, 4.30, 2.50, 2.60, 2.75, 2.95, 3.00, 3.95, 4.00, 3.60, 3.75, 5.00, 3.65, 3.85, 3.20, 3.30 and 3.35 meters respectively. Prepare a bold, neat sketch of the plot showing the elevations as indicated above and carry out necessary computations and determine the average depth to reach reduced level (TBM) set at 3.2 m (15 marks)

## Question 5 (15 marks)

A plot of land shown in Figure Q 5 is being prepared for a developmental project. The survey of the site has been conducted; linear dimensions of the land have been defined by a specific scale of 1: 250 as indicated on the figure. Use the data in Figure Q 5 to answer these questions appropriately.

i. Enter the items or quantities for windows and doors for the four toilets into a taking off sheet. (5 marks)

ii. Enter the items or quantities for the walling for the four toilets into an abstracting sheet. (5 marks)

iii. Prepare a Bill of Quantities (pre-tender stage) showing these items or quantities in 1(a) and b above; two carefully selected Provisional items and a Prime Cost sum of N300,000.00 for electrical works. (5 marks)

## Question 6 (15 marks)

In a certain civil engineering construction project, the architect was the prime consultant. The estimated total cost based on the tender sum was found to be eight hundred million Naira (N800, 000,000.00). The contractor was given 40% of the estimated total cost as an advance payment to stockpile materials needed for the project. The advance payment was to be deducted in three instalments of 50% 40% and 10 % of the advance payment collected. The total values of measured work before the preparation of the first, second and third certificates were N350 million, N420 million and N670 million respectively. Using an appropriate table (deduct tax, VAT and other relevant deductions):

i. Prepare the second and third payment certificates for the contractor on this project. (8 marks)

ii. Determine the amount for 1$^{st}$ stage payment to the Prime Consultant on this project. (7 marks)

Table Q 6:  Scale of Fees for Prime Consultant

| Cost of project | Fees payable as a percentage of cost of project |
|---|---|
| Up to N 5 million | 4.75% |
| Next N 10 million or part thereof. | 4.50% |
| Next N 15 million or part thereof. | 4.25% |
| Next N 45 million or part thereof. | 4.00% |
| Next N 75 million or part thereof | 3.50% |
| Next N 150 million or part thereof | 3.00% |
| Next N 200 million or part thereof | 2.50% |
| Balance over N 500 million | 1.75% |

BACK VIEW

7150

230  1500  230  1500  230  1500  230  1500  230

230

1960  1500

230

MALE VIP    MALE VIP    FEMALE VIP    FEMALE VIP

FLOOR PLAN

4 Inches PVC Pipe

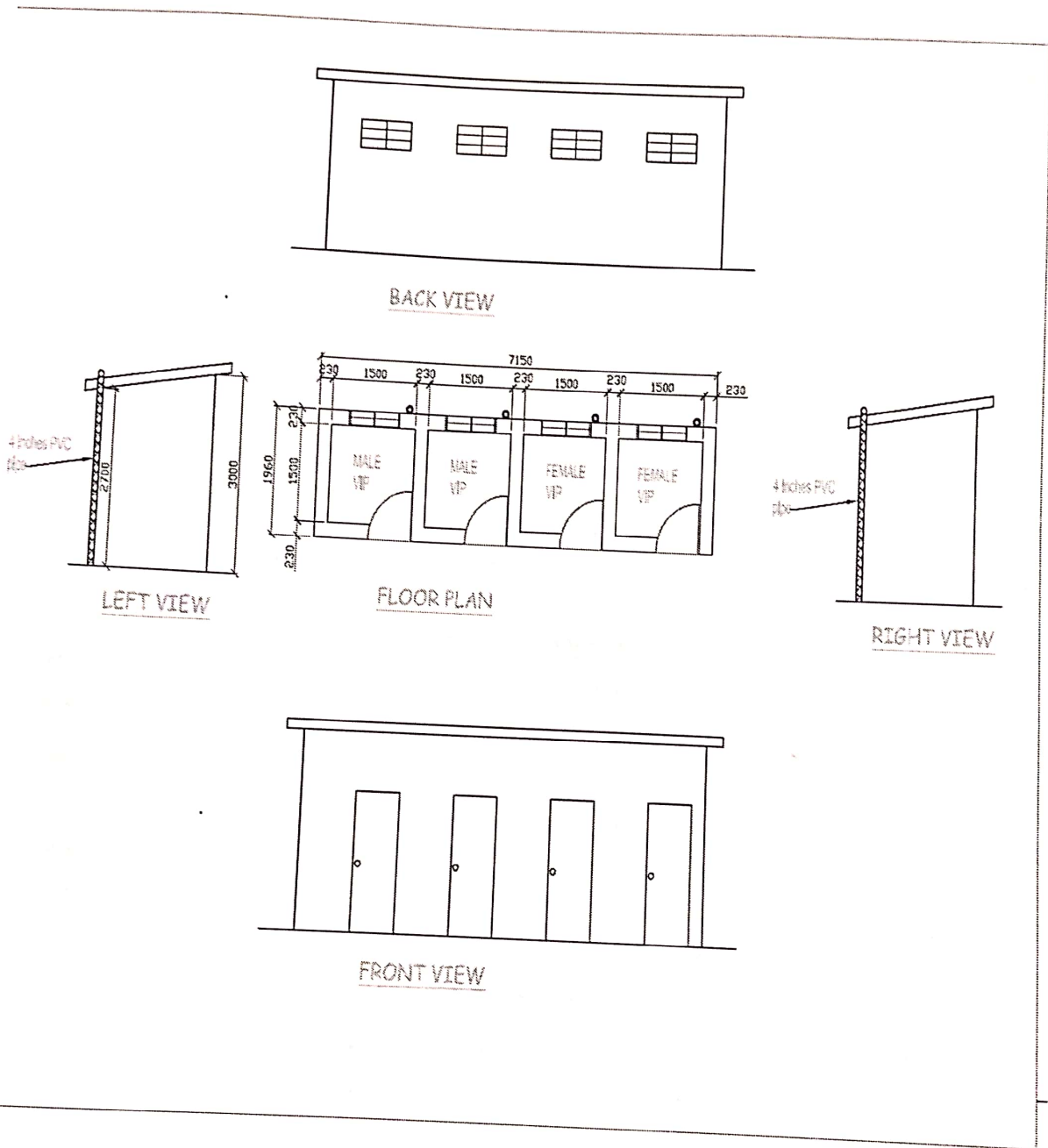2700    3000

LEFT VIEW

4 Inches PVC Pipe

RIGHT VIEW

FRONT VIEW

Figure Q5: Proposed Ventilated Improved Pit Latrine (VIP) for Cold Store