**DEPARTMENT OF COMPUTER ENGINEERING, ABU ZARIA**
**2nd SEMESTER (2023/24) SESSION**
**COEN512: ENGINEERING DESIGN & SUSTAINABILITY STUDIES**

**NOTE:**

- Each Group Should Consist of Not More Than Five (5) Students
- Any "Deliberate" Act of Plagiarism Will Lead to Outright Cancellation of Any Submission(s)
- Hard (Soft) Copy Submission for both Sections should be in one document.
    - Section B Will be in PowerPoint Format
- Each Group Can Use Either PowerPoint for Their Oral Presentation or a Video Presentation for Section B.

## SECTION A: PREAMBLE

### QUESTION ONE (10 Marks)

How can you, as an Engineer, justify the choice of CPM, Pert, etc. in undertaking project sequencing and critical path analysis?

An engineering project is represented by the following activities and projected durations. Draw the network diagram and determine the critical path and the slack for each activity

| DESCRIPTION | ACTIVITY | DURATION (WEEKS) |
|---|---|---|
| WP0 | A-B | 8 |
| WP1 | A-C | 6 |
| WP2 | A-D | 6 |
| WP3 | B-E | 5 |
| WP4 | C-F | 4 |
| WP5 | C-G | 10 |
| WP6 | D-G | 8 |
| WP7 | E-H | 5 |
| WP8 | F-H | 4 |
| WP9 | G-I | 7 |
| WP10 | H-I | 3 |

### QUESTION TWO (15 Marks)

The report of the World Commission on Environment and Development entitled **"Our Common Future"** (WCED, 1987) is widely considered to have been a key in putting sustainable development firmly into the political arena of international development thinking.

With relevant examples, describe **five (5)** key factors governing sustainable development in the modern society which need to be considered by any organization engaged in developmental initiatives

**NOTE:** It is important to contextualize this with a specific organization and initiative

### QUESTION THREE (15 Marks)

The FG has put in place EIA Policy and Procedure to guide in any development intervention and initiatives undertaken by both the private and public institutions. The FMCIDE selected you to

lead a team to conduct EIA in Zaria, Kaduna State where 500L-Tech Ltd is building the fibre infrastructure as part of the **Project 774 LG Connectivity**.
Describe the EIA process you and your team should follow to collect and collate quality data and information and generate genuine EIA information to guide the FMCIDE to make informed decisions

**SECTION B: CASE STUDY (60 Marks)**
**INTRODUCTION**
How can Design Thinking based solution be developed and implemented in a University? And what reasons do you think can make its implementation fail?
**NOTE:** Create a context (accommodation, crowded lecture halls, registration, sickbay, etc.)

**DESIGN BRIEF**
There are challenges with students' movement on (and within) campus and the need to maintain security and orderliness. It is important to note also that some students are also compelled (due to certain circumstances and peculiarities) to walk long distances (in the absence of or in indifference to other means of movement) for lectures, especially on main campus (between main campus and Phase II and between main campus and Agric complex respectively). Demonstrate using **DESIGN THINKING** principles, how you will convince a potential solution provider, what form of low-key solution (bike, motorbike, tricycle (Keke), mini-bus, etc.) to consider.
**NOTE:**

- Develop a Gantt Chart showing important timelines and milestones
- It is very **IMPORTANT** to show that your solution is a **SUSTAINABLE** one
    - ✓ It is necessary to create a LCA context for the solution
    - ✓ It is vital that some impact (environmental, social or economic) assessment context is provided