NATIONAL OPEN UNIVERSITY OF NIGERIA
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA
FACULTY OF SCIENCES
DEPARTMENT OF PHYSICS
2025_1 EXAMINATION

COURSE CODE: **PHY405**
COURSE TITLE: **ELECTRONICS III**
CREDIT UNIT: **3**
TIME ALLOWED: **(3 HRS)**
INSTRUCTION: ***Answer question 1 and any other three questions***

Question 1

i. Can 5673 be an octal number **3marks**
ii. Divide 111001.00 by 1100 **3marks**
iii. Convert the following decimal to binary 527, 327,73 **6marks**
iv. Using logic gate design Y = (A+B) C and Y = AB + CD **6marks**
v. Design the XOR truth table **2marks**
vi. State the functions of the Cathode ray oscilloscope **5marks**

Question 2

i. What are counters? **4marks**
ii. Design a shift left to register and show the clock trigger output **5marks**
iii. Draw the logic circuit for the original and simplified expression Y = ABC + BC + AD. 6marks

Question 3

i. What is an Analog Digital Converter (ADC)? **4marks**
ii. Draw a perfect labeled block diagram of a Digital Analog Converter (DAC) **5marks**
iii. A 5-bit DAC produces 0.5V for 00001, find Vout for 11010. **6marks**

Question 4

i. List 6 major subsystems of an oscilloscope **3marks**
ii. Sketch and label a cathode ray oscilloscope **6marks**
iii. Draw the circuit diagram of the differential amplifier type of electronic voltmeter and briefly explain its operation **6marks**

Question 5

i. What is ROM? **2marks**
ii. Using a 16 by 8-bit memory describe the memory operations step by step **6marks**
iii. Design a Mod 5 counter **7marks**

Question 6

i. What is the Mod number of a counter? **3marks**
ii. Describe a ring counter **6marks**
i. Draw a decade counter and tabulate is output with a negative transition clock **6marks**