UNIVERSITY OF EDUCATION, WINNEBA
INSTITUTE FOR TEACHER EDUCATION AND CONTINUING PROFESSIONAL DEVELOPMENT (ITECPD)
END-OF-FIRST-SEMESTER EXAMINATIONS. JUNE, 2023

LEVEL 200
COURSE CODE: JBM 231
COURSE TITLE: THOERIES IN LEARNING MATHEMATICS (JHS)

TIME ALLOWED: 2 HRS

STUDENT'S INDEX NUMBER:

GENERAL INSTRUCTIONS:

- **This paper is made up of ONE SECTION.**
- ***The Section is made up of six essay type questions.***
- ***Answer any FOUR questions in your answer booklet.***
- ***Each question carries equal marks. You are expected to start each question on a new page.***
- ***You are expected to hand over your answer booklet to the invigilator before you leave the examination hall.***

Instruction: *Answer any four (4) questions in the answer booklet provided.*

1.

a. State any **two (2)** definitions of mathematics and relate the significance of each to real-life situation. **(5 marks)**

b. With an appropriate example for each, briefly explain any **two (2)** rationales for sequencing content in the Junior High School mathematics curriculum. **(10 marks)**

c. A JHS mathematics teacher, believes in a cognitivist approach to teaching and learning mathematics. She has designed a lesson on geometry, where students will be introduced to the concept of angles and will work to understand the relationships between different types of angles. The students will work through a series of examples and exercises, where they will need to apply the rules, they have learned about angles to solve problems and find missing angles. Based on the scenario, answer questions *a*, *b*, *c*, and *d*.

i. Briefly explain the focus of the lesson on geometry in this cognitivist classroom. **(2marks)**

ii. Briefly explain any **two (2)** key roles of the mathematics teacher in a cognitivist classroom. **(2marks)**

iii. Briefly explain any **two (2)** key roles of the mathematics student in a cognitivist classroom. **(2marks)**

iv. State any **three (3)** purpose of using examples and exercises in this cognitivist geometry lesson. **(9 marks)**

2. a. Piaget identified four developmental stages of learning. As a mathematics teacher at the Junior High School,
   i. identify any **four (4)** characteristics of learners at the formal-operational stage. **(4 marks)**
   ii. Explain any **two (2)** instructional implications on these characteristics. **(6 marks)**

b. Explain any **five (5)** learner factors that affect the teaching and learning mathematics in Junior High Schools. **(15 marks)**

3. a. State any **six (6)** teachers' mathematical knowledge for teaching in the Junior High School. **(6 marks)**
   b. Explain any **three (3)** implications of teacher attitude towards learning and teaching mathematics at the Junior High School. **(9 marks)**
   c. Identify any **five (5)** ways you would use your knowledge gain in the concept of inclusion to facilitate in the learning and teaching mathematics in the Junior High School. **(10 marks)**

4. a. As a student teacher, state any **five (5)** ways in which you can apply the multiple intelligence theory in the Junior High School mathematics classroom. **(5 marks)**
   b. Briefly explain how teacher's content knowledge, pedagogical knowledge and teaching skills affect teaching and learning of mathematics in Junior High School. **(2marks)**
   c. Briefly explain any **two (2)** core competencies that are acquired throughout the processes of teaching and learning mathematics. **(8 marks)**

5. a. State any **one (1)** difference between beliefs and attitudes in the learning of Junior High School mathematics. **(5 marks)**
   b. Explain any **two (2)** educational implications of socio-cultural theory to the Junior High School mathematics teacher. **(10 marks)**
   c. State any **five (5)** main components of the Activity theory in mathematics education. **(10 marks)**

6. a. State any **three (3)** possible factors that affect learning and teaching mathematics in Junior High School. **(3 marks)**
   b. Briefly explain each of the following concepts:
      i. Beliefs **(2 marks)**
      ii. Attitudes **(2 marks)**
      iii. Values **(2 marks)**
   c. Identify any **three (3)** reasons why mathematics teachers should use the constructivist approach in teaching mathematics at the Junior High School. **(6marks)**
   d. Explain any **two (2)** social qualities that are to be nurtured in students to promote effective learning of mathematics in Junior High School classrooms. **(10 marks)**