INDEX NO_____ SIGNATURE_____

UNIVERSITY OF GHANA
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DEPARTMENT OF TEACHER EDUCATION
SCHOOL OF EDUCATION AND LEADERSHIP
COLLEGES OF EDUCATION
END OF YEAR THREE SEMESTER ONE EXAMINATIONS, 2022/2023
B.ED. PROGRAMME

COURSE CODE: TEJS 321
COURSE TITLE: TEACHING AND LEARNING MATHEMATICS FOR JHS (INTERM.)
TIME ALLOWED: 2 HOUR 30 MINUTES

General Instruction: This paper is made up of two sections, **A** and **B**. Answer both sections on the answer booklet provided. **Take** $\pi = \frac{22}{7}$ for all your calculations.

SECTION A [25 Marks]

There are four options after each question, lettered A to D. Read each question carefully and write in the answer booklet provided the letter that corresponds with the correct or best option. Each question carries one mark (**1 mark).**

1. A solid figure whose base is a plane polygon and sides are triangles that meet at a common vertex is known as_____.

   A. cone
   B. cube
   C. pyramid
   D. triangle

2. The side of cube A is 3 times the side of cube B. The volume of cube A is 3,780 cubic unit. Find the volume of cube B.

   A. 140 cubic unit
   B. 420 cubic unit
   C. 630 cubic unit
   D. 1260 cubic unit

Examiner: Dr. Awoniyi

3. The length of the median through the vertex of any lateral surface of a regular pyramid is_____.

   A. axis
   B. diagonal
   C. height
   D. slant height

4. Which of the following is a potential benefit of micro-teaching in mathematics?

   A. Creating a competitive environment among teachers.
   B. Delivering a lesson to a large group of students.
   C. Receiving immediate feedback on teaching skills and style.
   D. Reducing the need for professional development.

5. Formative assessment in mathematics is primarily used for_____.

   A. comparing students' performance with each other
   B. evaluating students' overall mathematical abilities
   C. monitoring students' progress and providing feedback
   D. obtaining a high grade in a controlled environment

6. The standard unit of length is the metre, and the arbitrary unit could be_____.

   A. Broomstick
   B. Palm
   C. Slate
   D. Yard

7. A cone has a circular base with a diameter of 7cm and a height of 20cm. Calculate the volume of the cone.

   A. $513.33cm^2$
   B. $503.33cm^2$
   C. $256.67\ cm^2$
   D. $138.76\ cm^2$

8. The length of rectangle A is 36 cm, and the length of rectangle B is 144 cm. The rectangles are similar. Find the ratio of the area of A to the area of B.

   A. Ratio of area of A to area of B = 1: 16.
   B. Ratio of area of A to area of B = 1: 8.
   C. Ratio of area of A to area of B = 1: 4.
   D. Ratio of area of A to area of B = 1: 2

9. In a micro-teaching session, teachers often receive feedback on everything EXCEPT their _____.

   A. lesson planning skills
   B. mathematical abilities
   C. personal teaching style
   D. understanding of educational policies

10. Micro-teaching in mathematics is primarily focused on all the following EXCEPT_____.

    A. assessing students' understanding of mathematical concepts
    B. conducting research in mathematics education
    C. eliminating conceptual errors and building confidence
    D. observing and improving teaching skills in mathematics

11. During a micro-teaching session, the role of the observer is to_____.

    A. assess the effectiveness of the teacher's instructional strategies
    B. evaluate the students' performance in mathematics
    C. solve mathematical problems alongside the students
    D. teach the mathematical concept to the students

12. Summative assessment in mathematics is typically conducted_____.

    A. after completing a unit or course of study
    B. at the beginning of a semester or a term
    C. during regular classroom instruction
    D. throughout the academic year

13. The main purpose of formative assessment in mathematics is to_____.

A. assess students' overall mathematical knowledge
B. assist the school in placing students in the right programme
C. determine students' readiness for summative assessments
D. identify students' strengths and areas for improvement

14. Formative assessment in mathematics is primarily focused on all the following EXCEPT_____.

A. evaluating students' achievement at the end of a course
B. facilitating student self-assessment and reflection
C. monitoring students' learning progress
D. providing ongoing feedback to students

15. A teacher uses a pop quiz to assess students' understanding of a recently taught mathematical concept. This is an example of_____.

A. diagnostic assessment
B. formative assessment
C. norm-referenced assessment
D. summative assessment

16. The circumference of a circle is 176cm. What is its diameter?

A. 22cm
B. 28cm
C. 56cm
D. 112cm

17. The total surface area of a cylinder is 6,512cm^2 and the circumference of its base is 176cm. Find its height.

A. 12cm
B. 10cm
C. 9cm
D. 8cm

18. Suppose a sequence consists of 10, 21, 15, 19, 25, 33, 23, 5, 7, 18. Calculate the median.

A. 17.5
B. 18.5
C. 19.5
D. 20.5

19. Awards in competitions, grading of students, placement of players in athletic positions, promotion of personnel, etc. are examples of_____.

A. Nominal Data
B. Ordinal Data
C. Discrete Data
D. Continuous Data

20. Calculate the volume of a cylinder whose base area is $94cm^2$ and the height is 76 cm.

A. $170cm^3$
B. $340cm^3$
C. $6512cm^3$
D. $7144cm^3$

21. An exterior angle of a regular polygon is 45^0. Find the sum of the interior angles of the polygon.
A. 1080
B. 900
C. 550
D. 540

22. Remediation in mathematics involves_____.

A. conducting regular classroom assessments for all students
B. focusing on advanced mathematical concepts for high-achieving students
C. promoting competition among students to improve their performance
D. providing additional support and resources to struggling students

23. All the following are examples of ordinal data in mathematics, EXCEPT the_____.

A. grades of students in a test (A, B, C, D, and F).
B. hall of residence for students at the colleges.
C. scores of students on a mathematics examination.
D. shoe size of a group of students in a quiz competition.

24. All the following are examples of nominal data in Mathematics, EXCEPT the _____.

A. preferred colour of jerseys for the Accra College football team
B. preferred shoe colour for the chief bridesmaid at a wedding
C. rankings of students in a mathematics competition
D. religion affiliation of level 200 students at your college

25. What is the key difference between nominal and ordinal data in mathematics?
A. Nominal data represents categories, while ordinal data represents rankings or orderings.
B. Nominal data represents measurements, while ordinal data represents categories.
C. Nominal data has a specific order, while ordinal data does not have any order.
D. Nominal data represents rankings, while ordinal data represents categories.

SECTION B [75 Marks]

Answer any **THREE** questions in this Section in the answer booklet provided.

In each question, show work in the answer booklet provided, including the answer.

Note: ***If you answer more than three questions, only the first three questions will be marked.***

1 a)

Solid Name	Vertices	Faces	Edges	Curved Surface
Sphere		1		
Cylinder			2	1
Octagonal Prism	16	10		
Hexagonal Pyramid	7			

Copy and complete the table above: **(10 marks)**

b) i. State the Van Hiele model of Geometric thinking. **(1 mark)**

ii. Explain **FOUR** of the levels of the model stated in 1(bi). **(12 marks)**

iii. What is the implication of the theory for a mathematics teacher? **(2 marks)**

2 a) Given that the curved surface area of a cone is 550cm, and its height is 24cm, find the:

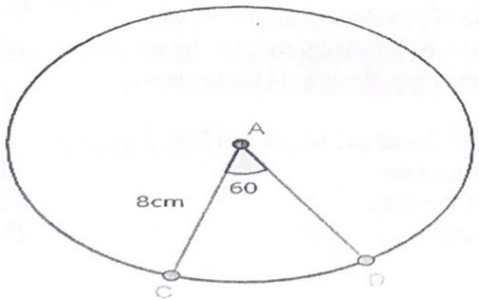
i. radius of the cone **(5 marks)**

ii. slant height of the cone **(3 marks)**

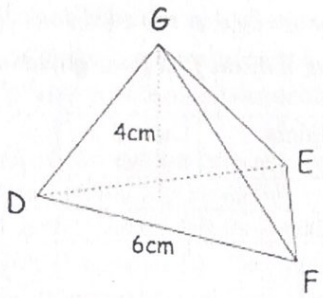
iii. volume of the cone **(3 marks)**

b) Explain **FIVE** reasons for conducting assessments for students in the teaching and learning of Mathematics. **(10 marks)**

c) Find the area of the shaded region of the circle if the value of the radius is 8cm and θ is 60^0. **(4 marks)**



3 a) DEFG is a triangle based pyramid. The base DEF is an equilateral triangle with side 6cm. The perpendicular height of the pyramid is 4cm.



i. Calculate the height of the equilateral triangle. **(5 marks)**

ii. Calculate the volume of the pyramid. **(10 marks)**

b) A petroleum attendant at a filling station recorded the number of litres of petroleum sold at their station for the week as follows:

Day of the week	Number of cars
Monday	780
Tuesday	850
Wednesday	820
Thursday	840
Friday	840
Saturday	790
Sunday	800

i. What was the mean litre of petroleum sold for the week? **(4 marks)**

ii. What was the median litre of petroleum sold for the week? **(3 marks)**

iii. What was the mode litre of petroleum sold for the week? **(3 marks)**

4 a) A cone has a base diameter of 10cm and height of 12cm. Find:

i. The slant height of the cone **(4 marks)**

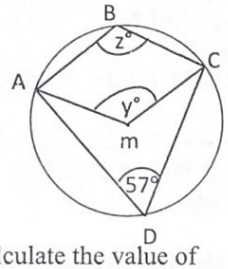
ii. Total surface area of the cone **(4 marks)**

iii. The volume of the cone **(3 marks)**

b) i. Distinguish between formative and summative assessments in the teaching and learning of Mathematics. **(5 marks)**

ii. State **THREE** examples of formative assessment techniques in the teaching and learning of mathematics. **(3 marks)**

c) Given the diagram:

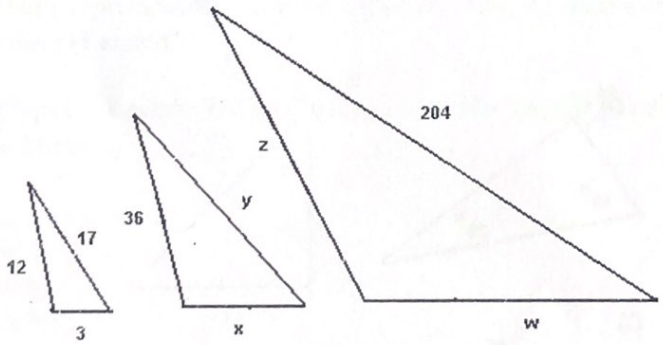


Calculate the value of

i. y **(3 marks)**

ii. z **(3 marks)**

5 a) Find all the unknown sides x, y, z, and w if all three triangles are similar. 9, 51, 144, 36 **(4 marks)**



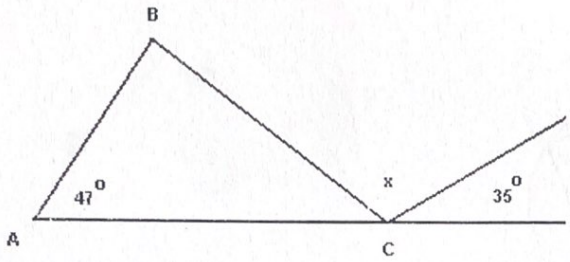
b) Using traditional assessment techniques to evaluate student achievement in Mathematics, state **THREE** of its:

i. Strengths **(3 marks)**

ii. Weaknesses **(3 marks)**

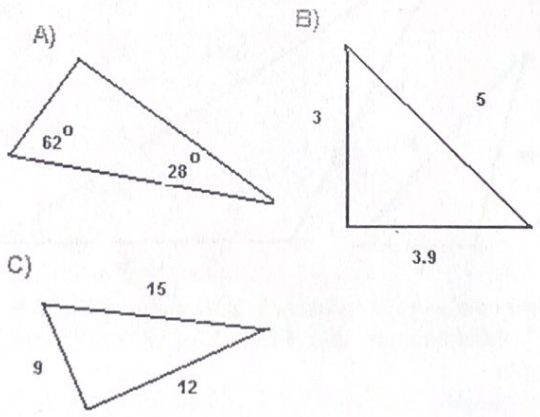
c) i. Curved surface area of a hemisphere is equal to 1,386 cm^2, what is its volume? **(6 Marks)**

ii. Given the figure below:



find x if triangle ABC is a right-angle triangle with angle $B = 90^0$. **(3 marks)**

d) Demonstrate through calculations which of the following is/are right-angled triangle(s)? **(6 marks)**



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