

Semester-end Examination
Paro College of Education
Royal University of Bhutan
Paro

Module: EAS202, (Supporting Mathematical Thinking) **Programme:** Diploma (ECCD) **Level:** II

Writing Time: Three Hours

Full mark: 100

DIRECTION: *This question paper consists of two sections, A and B. Section A consists of selected-response type questions and section B consists of constructed-response type questions. The weighting for Section A is 20 marks and section B is 80 marks. Every question in section A is worth 2 marks and section B 16 marks. The intended marks for the questions in section B are given alongside every question. Instructions for each section are mentioned accordingly. You are **NOT** allowed to carry/use any electronic devices to answer the questions.*

SECTION A (ONE QUESTION - 20 marks)

DIRECTION: *Answer all the sub-questions numbered a to j. Choose only one answer that best fits each sub-question and write in the answer script against the question number.*

Question 1

- a. A pre-school teacher is planning activities to introduce students to nonstandard units of measurement. Which of the following activities will best meet the teacher's goal?
- A. Asking students to use pencils to measure the length of a desk
 - B. Asking students to stand in a line, from the shortest person to the tallest
 - C. Asking students to use a measuring tape to measure the length of the classroom door
 - D. Asking students to determine how many one-litre bottles of water can fill a small bucket
- b. A kindergarten teacher wants her students to determine the following.
- To find if a student has a brother or a sister
 - Finding what they like doing the most at the play centre.
 - To check what curry they have brought for their pack lunch.

Which of the following concepts is most closely associated with the determinations the teacher is having the students make?

- A. Ordering
- B. Counting
- C. Patterning
- D. Classifying

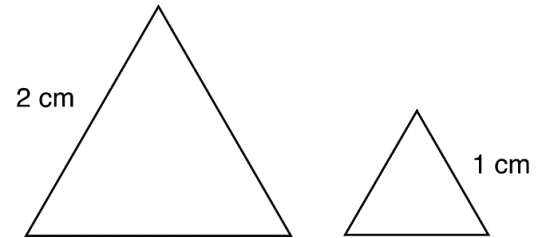
- c. Here is a schedule of costs for Gym and Swim membership at a sports facility.

Payment mode	Fees structure		
	Gym only (Nu.)	Swim only (Nu.)	Gym & Swim (Nu.)
12 months (lump sum)	38,740	29,965	50,245
12 months (monthly)	3,315	2,145	4,290
6 months (lump sum)	21,450	19,175	32,630
Casual (per visit)	780	325	975

All of the following statements are TRUE about the above Gym and Swim facility EXCEPT;

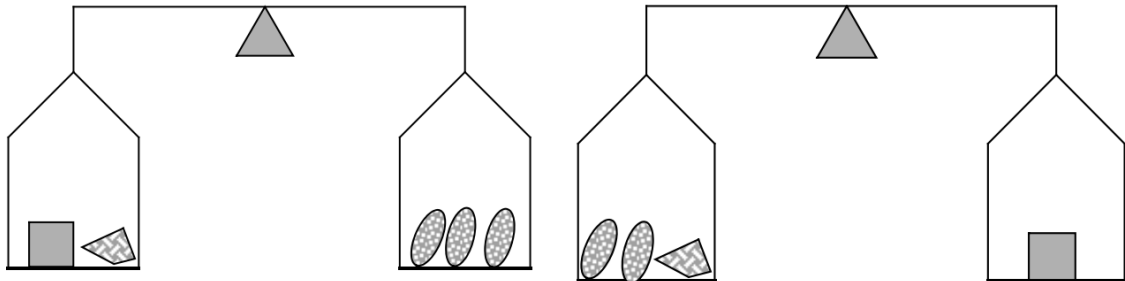
- A. Comparatively 12 months – lump sum payment mode membership is better than any other membership options
 - B. Overall, casual - per visit payment mode membership is the most expensive for availing the facilities
 - C. 12 months - monthly payment mode membership is the best deal for availing the facility
 - D. 6 months – lump sum payment mode membership is a better option for availing the facilities.
- d. A prekindergarten teacher is planning a lesson with a teaching objective of *sorting geometric objects by type of shapes*. Which of the following actions must children be able to perform successfully before the teacher teaches the lesson?
- A. Identifying attributes of objects
 - A. Sorting the geometrical shapes by use
 - B. Recognizing the position of the shapes
 - C. Creating sets of different sizes of objects
- e. Which of the following activities best promotes mathematical understanding among preschool children?
- A. Learning about the calendar.
 - B. Counting by rote to ten on a daily basis.
 - C. Sorting objects in a variety of ways and talking about how they are sorted.
 - D. Naming geometric shapes that can be found around the room and drawing pictures of them.

- f. The diagram given to the right shows two equilateral triangles.
How many times will the smaller triangle fit into the larger triangle?



- A. 2
B. 3
C. 4
D. 5
- g. A pre-school teacher is planning activities to introduce students to all forms of non-standard measurement. All of the following activities will meet the teacher's goal EXCEPT.
- A. Asking students to use pencils to measure the length of a desk.
B. Asking students to stand in a line, from the shortest person to the tallest.
C. Asking students to use a measuring tape to measure the length of the classroom door.
D. Asking students to determine how many one-litre bottles of water can fill a small bucket.
- h. Study the diagram below and answer the question that follows.

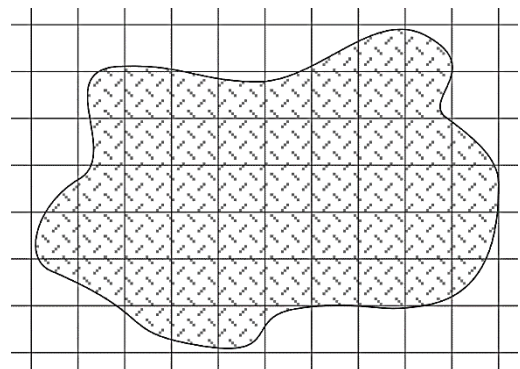
How many pyramids will balance one cube?



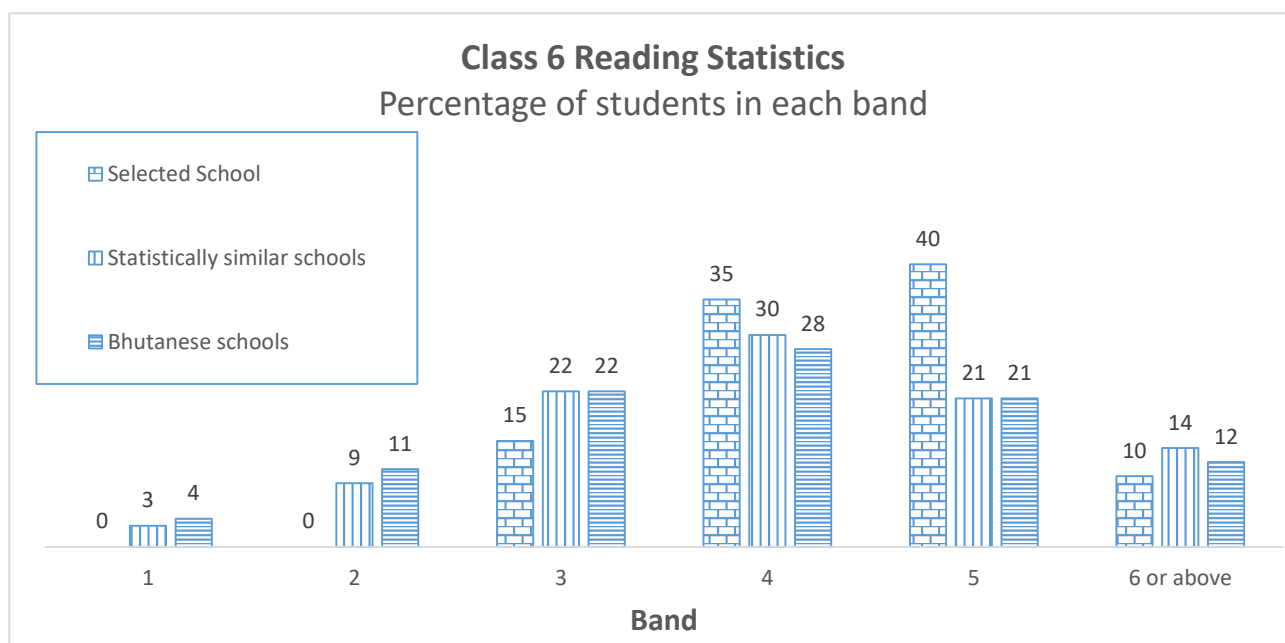
- A. 3
B. 2
C. 5
D. 4
- i. The diagram to the right shows a pond on a 2-metre square grid.

The closest estimated area of the pond is about,

- A. 50 square metre.
B. 45 square metre.
C. 90 square metre.
D. 35 square metre.



- j. The graph below shows the percentage of Class 6 students in six achievement bands for reading, of a selected school. It also shows comparable percentages of statistically similar schools and for all Bhutanese schools.



Given below are some statements about the graph.

- i. A higher percentage of Class 6 students at the selected school achieved at Band 4 compared to students at statistically similar schools.
- ii. At the selected school, more Class 6 students achieved at Band 4 than at any other band.
- iii. A greater percentage of the Class 6 student at the selected school achieved above Band 3 compared to Class 6 students at statistically similar schools.

Which of the following is correct about the above statements in the sequence given with regard to the graph shown above?

- A. True, True, False
- B. True, False, True
- C. False, False, True
- D. False, True, False

SECTION B

(Five Questions - 80 marks)

DIRECTION: *There are SIX questions in this section. Answer any **FIVE** questions. Sub-questions must be answered altogether in order for every question attempted.*

Question 2

- (a) Describe a simple activity or a set-up of an area/corner in which your focus of children's engagement and learning outcomes is on the development of data and chance. Use necessary illustrations and explanations as required. [8]
- (b) Design an appropriate activity of reasonable length to help young children develop skills and experience meaningful mathematical learning in particular measurement. [8]

Question 3

- (a) Explain how you as an educator at the centre can provide young children, as many pattern experiences as possible. [8]
- (b) Design a simple activity or a set-up of an area/corner in which your focus of children's engagement and learning outcomes is on the development of data and chance. Use necessary illustrations and explanations as required. [8]

Question 4

- (a) Explain your understanding of 'what does it mean to measure?', and how this understanding informs you to help your children at the centre enabling them to understand the measurement concept. List six measurement aspects that we can integrate in young children's play context. [5+3 = 8]
- (b) Elaborate on the opportunities and experiences young children are provided with for learning mathematical skills and concepts meaningfully from other learning spaces apart from the blocks play. [8]

Question 5

- (a) Elaborate on the following two points with reference to early mathematics in ECCD centre practices giving relevant examples. [4 + 4 = 8]
 - i. The importance of language.
 - ii. Family connections.
- (b) i). List all the key principles of counting.
 - ii). Explain any one of the principles clearly giving suitable examples and illustrations in support of the idea. [2 $\frac{1}{2}$ + 5 $\frac{1}{2}$ = 8]

Question 6

- (a) Choose any two from the following pre-number ideas and describe a short activity each in context of early years' mathematics learning experiences. [2 × 4 = 8]
- i. Matching.
 - ii. Sorting.
 - iii. Comparing.
 - iv. Ordering.
- (b) Give an account of how you provide geometric experiences to young learners at your play centre giving appropriate and meaningful examples. [8]

Question 7

- (a) Explain the role of technology/ICT in the context of ECCD, the strengths, drawbacks and the challenges in general and in relation to your workplace setting. [8]
- (b) Give an account of how you designed and executed an activity or a set-up at any one-play corner/area that reinforced and facilitated children's skills and understanding of any or several of the measurement aspects. [8]