

Student Number

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University of Fort Hare
East London Campus
Course Code: 50024

Bachelor of Education (Year 1)
(Foundation or Intermediate or Senior Phase)(GET Band)

Intermediate Phase Studies - Introduction to Learning and Teaching

IPS 123 E

NOVEMBER 2019

Mathematics Paper

Time: 3 hours
Subject: Intermediate Phase Studies - Mathematics
Marks: 100 Marks

This paper consists of 14 pages including this cover page

Internal Examiner

Peter Shaw

Moderator

Noludwe Bambiso

Notes

- Sections 1 and 2 are answered in UFH Multiple Choice Answer Sheets
- Section 3 is answered in this exam script
- Fill in your details in the textbox above and below
- NO CALCULATORS MAY BE USED
- Colouring pencils and pens may be used

Section	Value	Internal	Moderator
1	25		
2	25		
3	50		
Total	100		

STUDENT'S DETAILS

Student Number:

Surname:

First Name:

Date of Examination:

EXAMINERS

Peter Shaw:

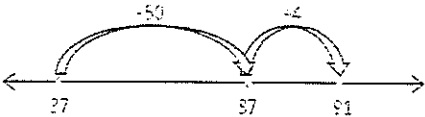
Noludwe Bambiso:

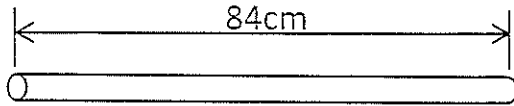
Result:

SECTION 1

(1 mark each)

On the Multiple Choice Answer Sheet, select A for a true answer or B for a false

1. The amounts of 0,75 and $\frac{2}{3}$ are equivalent – they have the same value.
2. High order questions are typically linked to rote-learning and drill work.
3. The question: “In how many ways can you make 16?” is an example of an open-ended question.
4. Rote-learning means that we learn facts, repeat information, rehearse processes.
5. In mathematics, iconic representation means using real objects to support concept-development and deep-learning.
6. In the calculation: $212 \times 387 + 176 \times 323$, the first step is to add 387 and 176 together.
7. The correct answer to: $4 + 5 \times 8 - 2$, is 54.
8. The numbers 19, 23, 29 and 31 are all examples of prime numbers.
9. The numbers 10, 20, and 40 are all examples of perfect squares.
10. The technique, bridging through 10, has been used to add $37 + 54$ in this sketch of an empty number line.
11. The natural number factors of 26 are 3, 4, 6, 8 and 12.
12. All natural numbers are also whole numbers.
13. The number 24 632 105 is three-hundred-thousand more than 24 602 105
14. A $\frac{1}{4}$ of a $\frac{1}{4}$ is $\frac{1}{8}$

15. The next number in this sequence: 21, 24, 28, 33, 39, _____ is 47
16. If $y = x^3$ and $x = 4$, then $y = 12$
17. A square field which covers 144m^2 , will have sides which are 12m long.
18. Without the use of a calculator, we can estimate that the square root of 39 will be greater than 6 but less than 7.
19. The mixed number $1\frac{12}{14}$ is equivalent to the improper fraction $\frac{13}{7}$
20. David Ausubel suggests that the use of “advance organizers” is a good technique for preparing pupils’ minds for new concepts and understanding of new ideas.
21. In learning, the concept of “assimilation and accommodation” is linked to Piaget’s theory of education.
22. “Equilibrium” is a state where new information has been assimilated and accommodated.
23. A stick is 84cm long. It is cut into two parts, $\frac{3}{7}$ and $\frac{4}{7}$ long. The length of the two parts will be 21cm and 63cm long, respectively.
- 
- The diagram shows a horizontal stick with a small circle at the left end. Above the stick, a double-headed arrow spans the entire length of the stick, with the text '84cm' centered above it.
24. The correct answer to: $7(2 + 5) - 4(11 - 8)$, is 41.
25. Vygotsky’s concept of “scaffolding” suggests that, for comprehensive learning to take place, teachers must provide appropriate support to their pupils.

SECTION 2

(1 mark each)

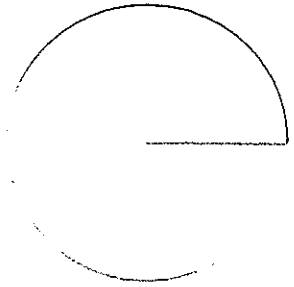
On the Multiple Choice Answer Sheet, select one option: A, B, C, D or E for each question

26. Which one of the following is an example of an open question?
- A. What is: $5 \times 3 - 4$
 - B. What is the sum of eight plus seven?
 - C. Continue this sequence: 1, 2, 4, 8, _____, _____, _____
 - D. What numbers can you make with 3, 7 and 9?
 - E. None of the above
27. Which one of the following sequences of numbers goes from bigger fractions on the left to smaller fractions on the right.
- A. $\frac{1}{4}$ $\frac{1}{5}$ $\frac{1}{6}$ $\frac{1}{7}$
 - B. $\frac{3}{4}$ $\frac{6}{8}$ $\frac{9}{12}$ $\frac{12}{16}$
 - C. $\frac{3}{16}$ $\frac{1}{4}$ $\frac{2}{9}$ $\frac{2}{5}$
 - D. $\frac{1}{3}$ $\frac{3}{7}$ $\frac{5}{8}$ $\frac{2}{3}$
 - E. None of the above
28. The number sequence: 3, 6, 12, 24, 48, etc., is a list of:
- A. Odd numbers
 - B. Perfect Cubes
 - C. Skip jumping
 - D. Doubling
 - E. None of the above
29. The number sequence: 1, 2, 4, 8, 16, 32, etc., is a list of:
- A. Powers of 2
 - B. Triangular numbers
 - C. An Array
 - D. Perfect cubes
 - E. None of the above
30. What are the next 3 parts of this pattern: 17, 19, 23, 29, _____, _____, _____
- A. 37, 39, 45
 - B. 35, 41, 49
 - C. 31, 37, 41
 - D. 33, 39, 43
 - E. None of the above

31. A farmer has 4 chickens. Each chicken has 5 chicks. Each chick eats 3 pips. Altogether, how many pips do all the chicks eat?
- A. 18
 B. 60
 C. 32
 D. 44
 E. None of the above
32. The solution to: $\frac{1}{4} + \frac{3}{5}$ is:
- A. $\frac{4}{9}$
 B. $\frac{17}{20}$
 C. $\frac{8}{20}$
 D. $1\frac{9}{15}$
 E. None of the above
33. The solution to: $2\frac{3}{4} - 1\frac{1}{4}$ is:
- A. 1
 B. $\frac{1}{4}$
 C. $\frac{5}{4}$
 D. $1\frac{1}{2}$
 E. None of the above
34. The solution to: $\frac{1}{4} \times \frac{3}{5} \times \frac{15}{12}$ is:
- A. $\frac{1}{4}$
 B. 3
 C. $\frac{19}{21}$
 D. $1\frac{1}{3}$
 E. None of the above
35. The solution to: $\frac{4}{7} \div \frac{20}{28}$ is:
- A. $\frac{7}{9}$
 B. $\frac{1}{3}$
 C. $\frac{4}{5}$
 D. 2
 E. None of the above

36. The grey shaded portion of the circle represents approximately:

- A. $3/4$
- B. $2/5$
- C. $5/8$
- D. $7/10$
- E. None of the above



37. The number that is two hundred and twenty thousand more than 345 652 503, is:

- A. 545 652 503
- B. 345 872 503
- C. 345 852 503
- D. 347 652 503
- E. None of the above

38. Four matches are used to construct a square. More matches are added to make two squares, and more matches are used to make three squares. How many matches are needed for 28 squares?

- A. 82
- B. 83
- C. 84
- D. 85
- E. None of the above



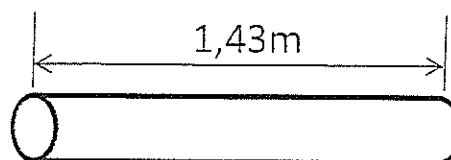
39. Which ONE of the following statements is not correct?

- A. $123,5 \div 0 = 123,5$
- B. $0 \times 389 = 0$
- C. $0 \div 0 = \text{indeterminate}$
- D. $0 - 16,24 = 16,24$
- E. None of the above

40. The sum of two numbers is 138. One number is five times bigger than the other number. The two numbers are:

- A. 44 and 94
- B. 36 and 102
- C. 23 and 115
- D. 28 and 110
- E. None of the above

41. A pipe is 1,43m long. It is cut into two parts $\frac{4}{11}$ and $\frac{7}{11}$ of its length, long. The two parts are:
- A. 0,52m and 0,91m long
 - B. 0,33m and 0,88m long
 - C. 0,39m and 1,04m long
 - D. 0,4m and 1,03m long
 - E. None of the above



42. 18 fence-poles are connected in a straight line with a distance of 3m between each pole. What is the distance between the first and last pole?
- A. 48m
 - B. 51m
 - C. 54m
 - D. 57m
 - E. None of the above
43. Rote learning is a learning strategy in which:
- A. Learners repeat words and methods and practice the same routines repeatedly
 - B. Learners are expected to try out different ideas to solve complex problems
 - C. Learners work in groups to investigate possible solutions to big questions
 - D. Learners use intuition, life-experience, and insights to solve problems
 - E. None of the above
44. Which one of the following is an example of an open question?
- A. $94 - 51 + 23 = ?$
 - B. How might you estimate the square root of 52?
 - C. Is 5×3 bigger or smaller than 6×4 ?
 - D. Is 25 a prime number?
 - E. None of the above
45. When we use a modern approach for teaching fractions, which of the following is NOT correct:
- A. We introduce the concept of **sharing** early in our investigations
 - B. We use **formal vocabulary** from the first lesson to explain the main fraction concepts
 - C. We work with problems which have **remainders** from the beginning of our explorations
 - D. We use **concrete apparatus** to assist in learning fractions
 - E. We use story-telling to **contextualize** the mathematics

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46. Epistemology refers to:
- A. a theory of knowing, a view of what is 'knowledge'
 - B. the methods and practices of teaching in the classroom
 - C. a description of the methods used for teaching
 - D. a description of the activities undertaken in the classroom
 - E. None of the above
47. Compression, in mathematics, is a term we use to explain that:
- A. different types of mathematical operators are placed into separate categories
 - B. new ideas are quickly lost if they are not regularly practiced
 - C. brackets are put around e.g. (12×5) to remind us to first multiply before we add
 - D. previously learned ideas, concepts and skills have become automatic
 - E. None of the above
48. In the CAPS documentation, one type of assessment that is mentioned is summative assessment. This type of assessment:
- A. informs the teacher about the learner's Mathematics problem areas that have the potential to hinder performance. Good teachers will then use appropriate interventions to assist learners in overcoming these challenges early in their school careers.
 - B. is the most commonly used type of assessment because it can be used in different ways at any time during a mathematics lesson. It is mainly informal and is not used for promotion. It provides constant feedback to learners.
 - C. is administered prior to teaching a particular mathematics topic. Mathematics teachers use it to find out if their learners meet the basic skills and knowledge levels required to learn a specific Mathematics topic.
 - D. is carried out after the completion of a Mathematics topic or a cluster of related topics. It is referred to as assessment of learning since it is mainly focusing on the product of learning. The results are recorded and used for promotion purposes.
 - E. None of the above.
49. Which phrase best completes the statement, *"When learners work independently, or work in groups, or try different ideas and use pebbles or other apparatus as visual scaffolds to assist them to solve problems, they are using a ..."*
- A. transmission mode learning technique
 - B. banking mode approach
 - C. rote learning methodology
 - D. constructivist thinking
 - E. All of the above

50. What word/words are missing from the following statement:

Ausubel suggests that _____ is/are used to introduce a lesson topic and illustrate the relationship between what the students are about to learn and the information they have already learned.

- A. Advance Organizers
- B. Compression
- C. Accommodation
- D. the Zone of Proximal Development
- E. None of the above

Now, carefully check your Multiple Choice Answer Sheet:

Make sure that you have correctly filled in your student number and have correctly shaded in the appropriate student number circles.

Once you have done this, set the sheet to one side and continue with the rest of your examination paper.

SECTION 3

Fill in the appropriate answer to each question in the space that is provided for the answer. Remember that the presentation – the setting-out – of your answers is also being evaluated and marks will be deducted for cases where untidy work is presented.

- 1 Use the table (columns) method to find the difference: $34\,646 - 10\,342$ (3 marks)

- 2 Use long division to find the quotient: $2\,198 \div 16$ (4 marks)

- 3 Construct a number-line to provide a visual representation of multiplication as repeated addition to find the product of 3×7 . (3 marks)

41. Write the number 60 in expanded notation. (2 marks)

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

42. In the provided hundred square, demonstrate your understanding of expanded notation to add $28 + 55$. (2 marks)

43. Below, add the appropriate names for the three parts of the mathematical operation. (3 marks)

$$\begin{array}{c} \xrightarrow{\hspace{10em}} \\ \xrightarrow{\hspace{10em}} \end{array} 42 \div 8 = 5 \xleftarrow{\hspace{10em}}$$

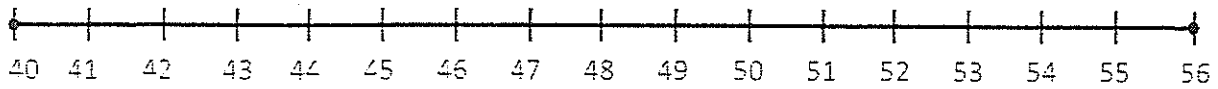
44. Find the prime factors of 56 and list your answer in exponent form. (2 marks)

Answer: $56 =$ _____

45. What does the term "instrumental knowledge" mean? (2 marks)

9. Circle all the prime numbers on the number line below.

2 marks

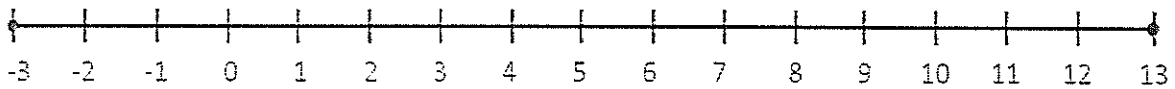


10. Below, use the distributive law to construct an area model to provide a visual solution for the product of 12×15 .

3 marks

11. Numbers have both an ordinal value and a cardinal value. Below, on the number-line, neatly demonstrate the ordinal and cardinal values of 8.

2 marks



12. Below, neatly construct a formal number line to demonstrate directed numbers to find the solution for $3 + 9 - 6 = 4$.

14 marks

14. Briefly explain the concept of embodied cognition.

(2 marks)

15. Briefly explain the concept of VP – visual processing.

(2 marks)

16. Use expanded notation and an empty number line to show the addition of $844 + 227$. (3 marks)

17.1 Explain how, without the use of a calculator, we can approximately determine the length of the side of a square which has an area of 66m^2 . (2 marks)

17.2 Approximately, what is the length of the side of a square with area 66m^2 ? (1 mark)

End of Examination 😊