KITH AND KIN INTERNATIONAL COLLEGE

*7/11 Kaoli Olusanya Street, Owode Ibeshe, Ikorodu, Lagos State.*

THIRD TERM EXAMINATION 2024/2025 ACADEMIC SESSION



|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **NAME** |  | | | | |
| **SUBJECT** | **FURTHER MATHEMATICS** | **CLASS** | **SS 1** | **DURATION** | **2 HOURS** |

**THEORY**

**(100 Marks)**

**INSRUCTIONS**

1. **Write your name in the space provided at the top of this question.**
2. **This paper is divided into two Parts: A and B.**
3. **Answer 10 questions; all in Part A, and 2 questions from Part B.**

**PART A**

**Attempt all questions in this part.**

1. Ifand, find the values of and**. WAEC 2006/2 (5 marks)**
2. A binary operation **A** is defined on the set of real numbers, **R**, by . Without using calculator, find the value of  leaving the answer in surd form.

**WAEC 2015/1 (5 marks)**

1. (a) Express  in the form, where and are rational numbers.
2. (b) If, express in terms of and **. WAEC 2010/1 (5 marks)**
3. Solve  **WAEC 2011/4 (5 marks)**
4. Solve: **tan (215)°**, for values of such that  **WAEC 2015/4 (5 marks)**
5. The position vectors of points **A**, **B** and **C** are and respectively.
6. Show that points **A**, **B** and **C** are collinear;
7. Determine the ratio **WAEC 2011/4 (5 marks)**
8. The management of a National Petroleum Cooperation intends to assign four different tankers at different depots **A**, **B**, **C** and **D** to four distribution outlets **I, II, III** and **IV**. The assignment costs are shown in the matrix below in thousands of naira.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | I | II | III | IV |
| A | 15 | 18 | 16 | 17 |
| B | 13 | 17 | 12 | 10 |
| C | 19 | 16 | 14 | 15 |
| D | 12 | 11 | 13 | 18 |

1. Assign depots to distribution outlets that will minimize the total cost.
2. Find the minimum assignment cost. **(5 marks)**

**PART B**

***Answer only two [2] questions only in this part.***

1. (a) The sum of the first  terms of a sequence is given by . Write down the first four terms of the sequence and an expression for the nth term.

(b)  A binary operation **\*** is defined on the set of real numbers **R**, by **\* + -**, where

**,** . Find the inverse of **-1** under **\*** given that the identity clement is zero.

**WAEC 2008/7 (10 marks)**

1. The table shows the distribution of ages of marks obtained by students in an examination.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Marks | 50 - 54 | 55 – 59 | 60 – 64 | 65 – 69 | 70 - 74 | 75 – 79 | 80 - 84 | 85 – 89 |
| Frequency | 5 | 15 | 20 | 28 | 12 | 9 | 7 | 4 |

Using an assumed mean of 67, calculate, correct to one decimal place, the :

(a) mean ;

(b) standard deviation of the distribution**. WAEC 2019/12 (10 marks)**

1. The coordinates of the vertices of triangle ABC are A(-2, 1), B(4, -2) and C(1, 8) respectively. If D(x, y) is the

foot perpendicular from A to BC, find

(a) an equation connecting and ;

(b) the unit vector in the direction of BC. **WAEC 2009/7 (10 marks)**

12. The position vectors of points **A**, **B** and **C** are and respectively.

(a) Show that points A, B and C are collinear;

(b) Determine the ratio **WAEC 2011/4 (10 marks)**

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| --- | --- | --- | --- | --- | --- |
| **NAME** |  | | | | |
| **SUBJECT** | **FURTHER MATHEMATICS** | **CLASS** | **SS 1** | **DURATION** | **1 HOUR** |

**OBJECTIVE TEST**

**(40 marks)**

Answer **all** questions

*Each* question is followed by *four* options lettered **A** to **D**. Choose the correct option for ***each*** question and *shade in* ***pencil*** on your answer sheet the answer space that bears the same letter as the option you have chosen. Give only **one** answer to each question and erase completely any answer you wish to change. Do **all** rough work on this question paper.

1. Given that P and Q are two non-empty subsets

of the universal set,.Find P (Q Q’)

A. P’

B. P

C. Q

D. Q’

1. If P = and Q = ,

where R, find PQ

A.

B.

C.

D.

3. If = (all perfect squares less than 30) and

= ( all odd numbers from 1 to 10). Find

A.

B.

C.

D.

4. Simplify

A.

B. 2

C.

D.

5. If , find the value of

A.

B.

C.

D.

6. Simplify

* 2. 4

7. If . Express in terms of .

A.

B.

C.

D.

8. Given that .

Find the value of

1. 16
2. 36
3. 25
4. 64

9. Simplify

A.

B.

C.

D.

10. Find the 21st term of the Arithmetic

Progression (A.P.):  -4, -1.5, 1, 3.5,...

1. 48.5
2. 51
3. 50.5
4. 46

11. Simplify

A.

B.

C.

D.

12. Solve the inequality;

A. or

B.

C.

D. or

13. Two functions f and g are defined by

→ 3and → evaluate

A.

B.

C.

D.

14. The function :  is defined on

the set of real numbers R. Find the domain of

A.

B.

C.

15. Given that find



16. If find

A.

B. 0

C. 1

D.

17. If , list the range of the

domain where is an integer.

A.

B.

C.

D.

18. The sum of the first terms of a linear

sequence is . Find the

common difference of the sequence.

A. 5

B. 4

C. 3

D. 2

19. Given that and ,

where is an obtuse angle and is an acute

angle. Find the value of sin

B.

C.

D.

20. If, find the values of

between and .

A. 44.5, 224.5

B. 123.5, 190.5

C. 135.5, 213.5

D. 135.5, 224.5

21. Evaluate:

A.

B. 0

C.

D. 1

22. Given that . Find the value

of

A. 36

B. 64

C. 25

D. 16

23. Simplify and

, find the value of .

A. 3

B. 4

C. 5

D. 6

24. Simplify

A.

B.

C.

D.

25. Evaluate:

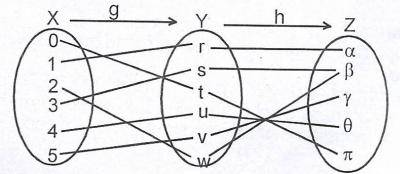
A.

B.

C.

D.

26.



g∘h  is

A.  one- to- one

B.   onto

C.  a relation

D.   a series

27. Solve: sin tan

A.  200°

B.   0°

C.  60°

D.  90°

28. If

determine the two possible values of

A.

B.

C.

D.

29. The mean age of men in a club is 50 years.

Two men aged 55 and 63 years left the club,

and the mean age reduced by 1 year. Find the

value of .

A.  30

B.  20

C.  18

D.  14

30.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Age in years | 10 – 14 | 15- 19 | 20 - 24 | 25 - 29 | 30 - 34 |
| Frequency | 6 | 8 | 14 | 10 | 12 |

Find the mean of the distribution.

A.  23

B.  23.4

C.  24.3

D.  24.6

31. Given that the straight lines

and are parallel, find a

relationship connecting the constants and

A.

B.

C.

D.

32. The line   is a tangent to the

curve  at (1, 0). Find the value

of the constant .

C.

D.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Number of babies | 3 | 5 | 6 | 7 | 8 |
| Number of villages | 1 |  |  | 3 | 2 |

The table shows the number of babies born in some villages on a certain day in a district. The mean of the distribution is 6. Use this information to answer questions 39 and 40.

33. Find the median of the distribution

A. 1

B. 2

C. 3

D. 6

34. Find the mode of the distribution

A. 6

B. 5

C. 4

D. 3

35. Find the equation of the line passing through

and parallel to the y- axis.

A.

B.

C.

D.

36. A line passes through the origin and the

point , what is the gradient of the line?

**A.**  1

**B.**  2

**C.**  3

**D.**  4

**37.** If  and , calculate the angle

between and .

A.  60°

B.  75°

C.  81°

D.  85°

38. Given that , and ,

find the magnitude of .

A.

B.   4

C.

D.

39. Find the distance between the points (2, 5) and

(5, 9).

A.   4 units

B.  5 units

C.  12 units

D.  14 units

40. Solve

A.

B.

C.

D.