

UMMUL-QURA HIGH SCHOOL

AROWONA BUS-STOP, AKANRAN ROAD, IBADAN
2020/2021 FIRST TERM EXAMINATION

SUBJECT:

Mathematics

CLASS: SSI

INSTRUCTION:

Answer all questions. Objective Part TIME: 2 hrs

[Paper 1 & 2]

1. Convert 125_{seven} to a number in base ten .

- A. 86_{ten}
- B. 57_{ten}
- C. 97_{ten}
- D. 68_{ten}

2. Convert 1101_{two} to a number in base 10

- A. 54_{ten}
- B. 27_{ten}
- C. 13_{ten}
- D. 31_{ten}

3. Express 13_{four} in binary number system.

- A. 111_{two}
- B. 101_{two}
- C. 10110_{two}
- D. 1111_{two}

4. If $222_{\text{six}} = X_{\text{seven}}$, find the value of X.

- A. 49_{seven}
- B. 42_{seven}
- C. 52_{seven}
- D. 24_{seven}

5. Convert 101.01_{two} to base ten

- A. $4\frac{1}{2}$
- B. $1\frac{1}{4}$
- C. $5\frac{1}{4}$
- D. $6\frac{2}{3}$

6. Evaluate $453_{10} + 856_{10}$

- A. 1089_{10}
- B. 1012_{10}
- C. 1309_{10}
- D. 1463_{10}

7. Evaluate $255_{10} - 453_{10}$

A. 198_{10}

B. 298_{10}

C. -298_{10}

D. -198_{10}

8. Evaluate $443_5 - 224_5$

A. 567

B. 562

C. 214

D. 235

9. If $p = 213_4$ and $q = 21_4$ what is pq ?

A. 11145_4

B. 25161_4

C. 32772_4

D. 11133_4

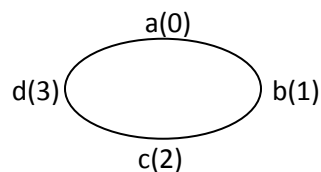
10. Given that $12_y = 12_{10}$, what is the value of y ?

A. 8

B. 6

C. 10

D. 9



Use above diagram to answer questions 11- 12.

Assuming a car start at point 0 and run round a circular path of 5m .

11. What will be the next position of the car having run for 5m
 A. a
 A. b
 B. c
 C. d
12. What will be the next position of the car having run for 9m
 A. a
 A. b
 B. c
 C. d
13. What are the correct elements of modulo 6?
 A. 5,4,3,2,1,0
 B. 4,3,2,1,0
 C. 0,1,2,3,4,5
 D. 0,1,2,3,4,5,6
14. What is value of 11 modulo 5 ?
 A. 1
 B. 2
 C. 3
 D. 4
15. Simplify the following modular arithmetic,
 $7 \oplus 8 \pmod{6}$
 A. 2
 B. 4
 C. 5
 D. 3
16. Simplify the following modular arithmetic,
 $1 \ominus 5 \pmod{6}$
 A. 1
 B. 2
 C. 3
 D. 4
17. Solve for the value of x in the modular arithmetic equation $2x + 3 = 1 \pmod{6}$
 A. 5
 B. 1
 C. 2
 D. 0
18. If $2y + 3y = 4 \pmod{6}$ what is the value of y ?
 A. 3
 B. 2
 C. 1
 D. No possible solution
19. Evaluate the following modular arithmetic,
 $12 \otimes 21 \pmod{5}$
 A. 1
 B. 2
 C. 3
 D. 0
20. If $x^3 = 8 \pmod{6}$ find the value of x
 A. 1
 B. 2
 C. 4
 D. 0
21. If the number 0.03600 is expressed in standard form, it become
 A. 3.6×10^{-3}
 B. 36×10^2
 C. 3.6×10^3
 D. 3.6×10^{-2}
22. If 6254.20 is expressed in standard form, it becomes
 A. 6.25×10^{-3}
 B. 6.2542×10^4
 C. 6.2542×10^3
 D. 6.2542×10^{-4}
23. Simplify $10^2 \times 10^{-3}$
 A. 10^5
 B. 10^{-5}
 C. $1/10^{-5}$
 D. $\frac{1}{10}$
24. Simplify $33n^7 \div 3n^3$
 A. $13n^5$
 B. $11n^4$
 C. $7n^2$
 D. $11n^2$
25. If $(3p)^{-2} \times 9p^6$ is simplified, it will become

- A. $56p$
 B. $36p$
 C. $8p^{-2}$
 D. p^4
26. If $(a^3b)^4$ is evaluated, it becomes
 A. a^3b^4
 B. a^7b^4
 C. $a^{12}b^4$
 D. $a^{12}b$
27. If $(-U^3V^2)^4$ is evaluated, it becomes
 A. U^7V^6
 B. $-U^{12}V^6$
 C. $-U^{12}V^8$
 D. $U^{12}V^8$
28. If $16^{0.25}$ is simplified, it becomes
 A. 4
 B. 3
 C. 2
 D. 8
29. If $27^{1/3}$ is simplified, it becomes
 A. 2
 B. 4
 C. 3
 D. 9
30. If $2^{2(a-1)} = 16$, find the value of a
 A. 4
 B. 5
 C. 3
 D. 2
31. What is the logarithm of 9 into base 3
 A. 3
 B. 2
 C. 4
 D. 1
32. If $\text{Log}_x 27 = 3$, what is the value of x ?
 A. 4
 B. 3
 C. 5
 D. 2
33. If $\text{Log } u = 3$, what is the value of u ?
 A. 100
 B. 1000
 C. 8
 D. 100000
34. Evaluate $\text{Log}_3 \frac{1}{81}$
 A. 3
 B. 4
 C. -3
 D. -4
35. Express $4^3 = 64$ in logarithmic form
 A. $\text{Log}_4 64 = 3$
 B. $\text{Log}_3 64 = 4$
 C. $\text{Log}_3 4 = 64$
 D. $\text{Log}_4 3 = 64$
36. If Log of 64 into base 8 is 2, then the index form is
 A. $2^8 = 64$
 B. $8^2 = 64$
 C. $2^6 = 64$
 D. $64 = 8^3$
37. Evaluate the following modular arithmetic: $3 \div 5 \pmod{6}$
 A. 2
 B. 3
 C. 5
 D. 1
38. Simplify the following $4^{0.5}$
 A. 2
 B. 1
 C. 3
 D. 4
39. Solve the following indicial equation
 $X^{1/2} = 6$
 A. 36
 B. 35
 C. 24
 D. 25
40. Evaluate the following indicial expression
 $5b^2 \times 2b^3$
 A. $5b^2$

B. $10b^3$

C. $10b^2$

D. $10b^5$

41. Evaluate the following : $y^4 \div y^2$

A. y^4

B. y^{-2}

C. $\frac{1}{y}$

D. y^2

42. Simplify the following indicial expression

$r \times r^0 \times r^{-5}$

A. r

B. r^2

C. $\frac{1}{r}$

D. r^{-4}

43. Express 1101_{two} in denary

A. 50

B. 27

C. 11

D. 13

44. Express 0.000724 in standard form

A. 7.24×10^{-2}

B. 7.24×10^{-3}

C. 7.24×10^{-4}

D. 7.24×10^{-5}

45. Evaluate $\sqrt{1.44}$

A. $1\frac{1}{2}$

B. $1\frac{1}{5}$

C. $\frac{1}{2}$

D. $\frac{1}{4}$

46. What is the square root of $\frac{49}{121}$?

A. $\frac{3}{7}$

B. $\frac{4}{7}$

C. $\frac{7}{11}$

D. $\frac{5}{7}$

47. Simplify this $\frac{12 \times 10^8}{4 \times 10^5}$ and leave your

Answer in ordinary form

A. 300

B. 1000

C. 2000

D. 3000

48. What is the missing numbers if the following addition is in base two ?

$$\begin{array}{r} \text{xxxxx} \\ + \quad \text{111} \\ \hline \text{100101} \end{array}$$

A. 11111

B. 11110

C. 10110

D. 10101

49. What is the square of HCF of 60 and 108 ?

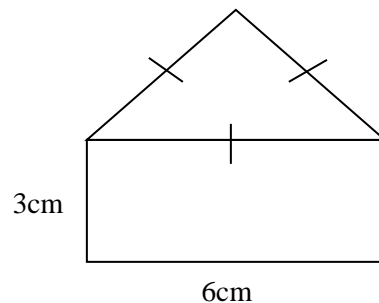
A. 12

B. 36

C. 120

D. 144

50. Find the perimeter of the figure below



A. 18cm

B. 24cm

C. 30 cm

D. 33cm

SECTION B (THEORY)**TIME: 1hr****INSTRUCTION:** 1. Answer any three questions in this section.

2. You are advised to spend at most 15 mins on each question making 1hr all together.

Q1a. Convert $(97)_{\text{ten}}$ into base three .b. In a mythical country , where the number system is base5, the price of soap is increased by 40_5 percent. Later , the new price is reduced by 40_5 percent. What the original price of the soap ? (leave your answer in base5). [WAEC]

[10 marks]

Q2a. Solve the subtraction of the following modular arithmetic using **modulo5**

i. 20 , 35 , 15 .

b. Copy and complete the following multiplication table for **modulo5**.

(Show your workings clearly)

Modulo5

\otimes	1	3	4	5
1	1	3		
		1	3	
3				0
		2		0

[WAEC]

[10 marks]

Q3a. Simplify $-3(de^3)^4$

b. Solve for the value of x in the following indicial equations:

i. $5^{2(x-1)} \times 5^{x+1} = 0.04$

ii. $9^{2x-1} \times 3^{3x-1} = 27^{x+3}$

[10 marks]

Q4a. If $\text{Log } 1000 = \text{Log}_7 x$ find the value of x

b. Find the values of unknown in the following logarithmic equations:

i. $\text{Log}_8 0.0625 = P$

ii. $\text{Log}_4 8 = x - 1.$

[10 marks]

Q5a. Plot a graph of $\log Y = X$ using the table below and a scale of 1cm = 1unit on Y-axis and 1cm = 0.1unit on X-axis.

b. From your graph, solve the following :

- i. Log 2.5 ii. Log 5.7 iii. Log 7.9 iv. Antilog 0.7
- v. Antilog 0.67

[10 marks]

Q6a. With the use of table, find the logarithms of the following numbers :

- i. 63.24
- ii. 294.5
- iii. 693572
- iv. 264.425
- v. 777.7

b. With the use of table, find the antilogarithms of the following logarithms:

- i. 3.4485
- ii. 5.0813
- iii. 4.2105
- iv. 2.0088
- v. 6.7142

