UMMUL QURA HIGH SCHOOL
AROWONA BUS-STOP, AMULOKO-AKANRAN ROAD, IBADAN.
2020/2021 SECOND TERM EXAMINATION

SUBJECT: MATHEMATICS DURATION : 3:00hrs
CLASS: SS 1 INSTRUCTION: Attempt section A and B

SECTION A: OBJECTIVES

1. Convert 10121_3 to base 10
   A. 87
   B. 82
   C. 97
   D. 88
2. Convert binary number 110011 to base 10
   A. 41
   B. 57
   C. 71
   D. 31
3. Convert 3125 in base 4 to base 10
   A. 515
   B. 419
   C. 525
   D. 415
4. Fill in the blank space of $(12)_{16} = (\quad)_{10}$
   A. 18
   B. 14
   C. 16
   D. 12
5. Convert 1.011_2 to base 10
   A. 1.225_{10}
   B. 1.755_{10}
   C. 1.555_{10}
   D. 1.375_{10}
6. Simplify $234_5 + 434_5$
   A. 1223_5
   B. 1333_5
   C. 1232_5
   D. 1222_5
7. Simplify $1111_2 - 1011_2$
   A. 101_2
   B. 100_2
   C. 111_2
   D. 110_2
8. Simplify $1011_2 \times 11_2$
   A. 100001_2
   B. 110001_2
   C. 111001_2
   D. 111101_2
9. Simplify $3310_5 - 1442_5$
   A. 1212_5
   B. 1313_5
   C. 1314_5
   D. 1131_5
10. Given that $13_X = 12_{10}$, find the value of x
    A. 9
    B. 8
    C. 7
    D. 6
11. The integers of modulus 5 are
    A. {0, 1, 2, 3, 4}
    B. {0,1,2,3,4,5,6}
    C. {0, 1,2,3}
    D. {0,1,2,3,4,5,7}
12. Simplify 12(mod 5)
    A. 2(mod 5)
    B. 2(mod 6)
    C. 2(mod 12)
    D. 3(mod 5)
13.

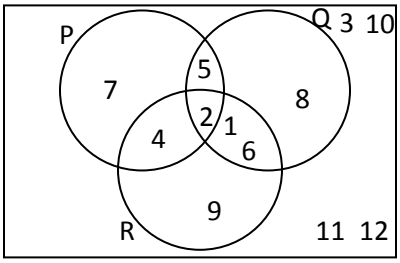
+	0	1	2
0	0	1	2
1	1	2	0
2	▢	▢	▢

In line addition table for modulo 3 above; the correct missing are

A. 2, 0, 1
B. 2, 0, 2
C. 1, 0, 2
D. 1, 0, 1

14. Express 560 in standard form
    A. 5.6×10^3
    B. 5.6×10^2
    C. 5.6×10^4
    D. 5.6×10^1
15. Simplify $a^5 \times a^2$
    A. a^{10}
    B. a^7
    C. a^5
    D. a^2
16. simplify n^0
    A. n
    B. 1
    C. 0
    D. 2
17. Simplify $16^{½}$
    A. 16
    B. ½
    C. 4
    D. 8
18. Find the value of x in $7^x = 49$
    A. 49
    B. 7
    C. 2
    D. 9
19. Calculate the value of y of $3 \times 9^{1+y} = 27^{-y}$
    A. $\frac{-2}{5}$
    B. $\frac{2}{5}$
    C. $\frac{3}{5}$
    D. $\frac{-3}{5}$
20. Simplify $\log_3 81$
    A. 4
    B. 3
    C. 2
    D. 5
21. Members of a set are called _____
    A. Elements
    B. Set notation
    C. Member
    D. Set
22. The set of prime number include
    A. 1, 2, 3
    B. 2, 3, 5
    C. 3, 5, 9
    D. 1, 7, 9
23. Empty set otherwise known as
    A. Void set
    B. Cardinality of set
    C. Element
    D. Equal set
24. The following are examples of finite set except
    A. Instruments in a mathematical set
    B. A set of even number between 1 and 10
    C. All counting of number
    D. The set of prime number between 1 and 2
25. Write all possible subset of set {9, 10, 11}
    A. {9},{10},{11},{9,10},{10,11},{9,11},{Ø} and {9,10,11}
    B. {9},{10},{11},{9,10},{10,11},{9,11},{Ø}
    C. {9},{0},{9,10},{9,11},{Ø}
    D. {9,10,11},{9},{10},{Ø}
26. If A = {3,4,5,6} and B = {3,5,7,9,11}, Find A ∪ B
    A. {3,4,5,6,7,9,11}
    B. {3,4,5,5,7,9,11}
    C. {3,4,5,6,7,8,9}
    D. {3,4,5,6,7,9,10}

27. Let A = {a,b,c,d,e,f} and B = {a,e,i,o,u}. A ∩ B is{a,b}
    A. {a,e}
    B. {i,o}
    C. {a,i}
28. Given a universal set N = {X: 2 ≤ x < 5}, the member of N is
    A. {2,3}
    B. {2,3,4}
    C. {-1,0,1,2}
    D. {2,4}



Use the diagram above to answer question 29 and 30

29. P ∩ Q ∩ R is
    A. 5
    B. 1, 6
    C. 2
    D. 4
30. $P \cap Q \cap R^1$
    A. 2
    B. 4
    C. 1, 6
    D. 5
31. Let μ = {a,b,c,d,e,f,g,h}, A= {a,b,c,d}, B = {b,d,f,h}
    $(A \cup B)^1$ is
    A. {a,b,c,d,f,h}
    B. {e,g}
    C. {a,c,e,f,g,h}
    D. {a,b,c,d}
32. In a class of 40 students, a student can study French or History or Both. If 20 study French, 23 study History and 6 study neither, how many students study both subjects?
    A. 9
    B. 20
    C. 6
    D. 23
33. Make **t** the subject of the formular: $r = \frac{s+t}{st}$
    A. $t = \frac{s}{rs-1}$
    B. $t = \frac{t}{rs-1}$
    C. $t = \frac{r}{rs-1}$
    D. $t = \frac{1}{rs-1}$
34. Make g the subject of the formula in the equation: $T = 2\pi \sqrt{\frac{h+k}{gh}}$
    A. $g = \frac{4\pi^2(h^2+k)}{hT^2}$
    B. $g = \frac{4(h^2+k^2)}{hT^2}$
    C. $g = \frac{4\pi^2(h^2+k^2)}{hk^2}$
    D. $g = \frac{4h^2(\pi^2+k^2)}{hT^2}$
35. If P varies directly as R, and R = 12 when P is 10, find the relationship P and R
    A. $P = \frac{5R}{6}$
    B. $\frac{6R}{5}$
    C. $\frac{1R}{6}$
    D. $\frac{12R}{6}$
36. Use the question 35 above to answer question 36. If P = 6, find the value of R
    A. $7\frac{1}{5}$
    B. $5\frac{1}{4}$
    C. $6\frac{1}{2}$
    D. $7\frac{1}{2}$

37. If V varies inversely as W and V = 120 when W = 6, Find V when W = 9. V is
    A. $\frac{730}{9}$
    B. $\frac{620}{2}$
    C. 70
    D. 80
38. If m varies directly as n and inversely as the square of P. If m = 3 when n = 2 and P = 1, find m in terms of n and p. m is ___
    A. $\frac{3n}{2p^2}$
    B. $\frac{3p}{3n^2}$
    C. $\frac{3}{2p^2}$
    D. $\frac{4}{2p^2}$
39. Which of the following expression is quadratic
    A. ½ x + 2
    B. r + 15
    C. $\frac{1}{10}s - \frac{2}{5}$
    D. $r^2 - r - 4$
40. Factorise $x^2 + 9x + 14$
    A. (X + 1)(X + 2)
    B. (X + 2)(X + 7)
    C. (X + 3)(X + 4)
    D. (X + 7)(X + 7)
41. Factorise $V^2 - 6V - 27$
    A. (V + 3)(V - 9)
    B. (V + 6)(V - 7)
    C. (V - 3)(V - 6)
    D. (X + 3)(V - 3)
42. Factorise $16y^3 + 16y^2 + 4y$
    A. 4y(2y + 1)(2y + 1)
    B. 2y(2y + 1)(2y + 1)
    C. Y(4y + 1)(2y + 1)
    D. 5y(2y + 2)(2y + 1)
43. Factorise $12x^2y^2 - 11xy - 1$
    A. (xy - 1)(12xy + 1)
    B. (x2 - 1)(11y + 1)
    C. (xy - 2)(12xy + 1)
    D. (3xy - 1)(11xy + 1)
44. Factorise $3Y^2 - 75$
    A. 3(y - 5)(y + 5)
    B. 2(y - 5)(y + 5)
    C. 2(y - 2)(y + 5)
    D. (y - 5)(y + 5)
45. Solve this quadratic equation $3t^2 - 12t = 0$
    A. t = 0 or 4
    B. t = 1 or 3
    C. t = 0 or 12
    D. t = 0 or 3
46. Construct a quadratic equation whose roots are 5 and -8 respectively.
    A. $Y^2 + 3Y - 40 = 0$
    B. $Y^2 + 2Y - 20 = 0$
    C. $Y^2 + Y - 10 = 0$
    D. $Y^2 - 2Y - 40 = 0$
47. Find the roots of $2r^2 - 18 = 0$
    A. (r - 2)(r + 3)
    B. (r - 3)(r + 3)
    C. (r + 5)(r + 4)
    D. (r + 2)(r - 2)
48. Simplify $\log_{0.5}32$
    A. 5
    B. – 5
    C. 0.5
    D. 32
49. Evaluate $\frac{1\frac{1}{4} + 1\frac{1}{2}}{5\frac{1}{8} - 3\frac{3}{4}}$
    A. 1
    B. 2
    C. 3
    D. 4
50. Find the value of $121^{½}$
    A. 11

B. 121 D. 13

C. 12

SECTION B: THEORY PART
INSTRUCTION: ANSWER FOUR QUESTIONS

1. In a survey of 290 newspaper readers,181 of them read The **Daily Time**, 142 read The **Guardian**, 117 read **Punch** and each read at least one of the three papers. If 75 read The **Daily Time** and The **Guardian**, 60 read The **Daily Time** and **Punch** and 54 read The **Guardian** and **Punch**.

(a). Draw a venn diagram to illustrate this information

(b). How many readers read:

i. All three papers

ii. Exactly two of the papers

iii. Exactly one of the papers

iv. The Guardian only?

2. The cost of maintaining a school is partly constant and partly varies as the number of pupils. With 50 pupils, the cost is #15,705 and with 44 pupils, it is #13,305.

(a). Find the cost when there are 40 pupils

(b). If the fee per pupil is #360.00, what is the least number of pupils for which the school can run without loss

3(a). The area of a rectangular swimming pool is $35m^2$ while the perimeter is 24cm. find the length of the swimming pool.

3(b). Anu's age exceeds Sumbo's age by 15. The sum of the square of their ages is 725. What are their ages.

4(a). Copy and complete the table below for $Y = 3X^2 - 5X - 7$

X	-3	-2	-1	0	1	2	3	4
Y	35			-7	-9		5	

(b). Using a scale of 1cm = 1unit on X – axis and 1cm = 5units on Y – axis, draw the graph of $Y = 3X^2 - 5X - 7$

(c). From the graph, find the roots of the equation $3x^2 - 5x - 7 = 0$