

ZAMANI COLLEGE KADUNA  
SS1 GENERAL MATHEMATICS  
HOMEWORK 2014/2015 SESSION

TERM 1

TOPIC: NUMBER BASE SYSTEM

INSTRUCTION : ANSWER ALL THE QUESTIONS

1. a) Convert the following to base ten: (i)  $6173_{\text{eight}}$  (ii)  $t5e_{\text{twelve}}$   
 b) Convert (i)  $587_{\text{ten}}$  to base five (ii)  $423_{\text{five}}$  to base three
2. Simplify (i)  $341_{\text{five}} \div 22_{\text{five}}$  (ii)  $402_{\text{five}} \times 13_{\text{five}}$  (iii)  $405_{\text{eight}} - 217_{\text{eight}}$
3. Convert the following bicimals to decimals: (i) 10.011 (ii) 110.11 (iii) 0.101
4. Find the missing number (\*\*\*\*) if the following addition is in base five  

$$2004 + 143 + **** + 201 = 4240$$
5. (i) Convert to base ten : (i)  $10100_{\text{two}}$  , (ii)  $110011_{\text{two}}$  (b) Convert to base two :  
 (i)  $23_{\text{ten}}$  (ii)  $60_{\text{ten}}$

TOPIC: MODULAR ARITHMETIC

1. Copy and complete the table below for addition (mod 5)

$\oplus$	0	1	2	3	4
0					
1					
2					
3					
4					

2. Find the simplest form of the following in the given moduli :  
 (a)  $-5 \pmod{6}$  (b)  $-52 \pmod{11}$  (c)  $-75 \pmod{7}$
3. Find the values of the following in the given moduli:  
 (A)  $16 \otimes 7 \pmod{5}$  (b)  $80 \otimes 29 \pmod{7}$  (c)  $27 \otimes 4 \pmod{7}$
4. Find the values of the following in the given moduli:  
 (a)  $8 \oslash 2 \pmod{3}$  (b)  $92 \oslash 10 \pmod{4}$  (c)  $17 \oslash 9 \pmod{2}$
5. Solve the equations in the given moduli: (a)  $8 + x = 0 \pmod{9}$  (b)  $3x = 1 \pmod{7}$   
 (c)  $2x + 3 = 1 \pmod{6}$  (c)  $5x + 2 = 3 \pmod{11}$

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TOPIC: INDICES

1. Simplify the following: (i)  $10^5 \times 10^4$  (ii)  $5y \times 4y^3$  (iii)  $x^3 \div x^{-5}$  (iii)  $5x^2 \times 4x^0 \times 2x^{-6}$
2. Simplify the following: (i)  $\left(\frac{16}{81}\right)^{-\frac{3}{4}}$  (ii)  $\left(\frac{18}{32}\right)^{-\frac{3}{2}}$
3. Solve equations (i)  $4^{c-1} = 64$  (ii)  $5x = 40x^{-2}$

**Use tables to solve question 15 – 18.**

15.  $\frac{(17.2)^2 \times 4.93}{\sqrt[3]{6750000}}$

16.  $\sqrt[3]{\left(\frac{38.32 \times 2.964}{8.637 \times 6.285}\right)^2}$

17.  $\frac{315.6 \times 95.47}{456.2 \times 31.88}$

18. Calculate the length of a solid cylinder of diameter  $7.5\text{cm}$  and volume  $435\text{cm}^3$ . (Use the value  $0.4971$  for  $\log \pi$ )

19. If  $\mu = \{1, 2, 3, 4, 5, \dots, 10\}$

$$A = \{\text{Prime number less than } 10\}$$

$$B = \{1, 3, 6, 7\}$$

i. Write out the elements of set A

Find :

ii.  $A'$

iii.  $B'$

iv.  $(A \cap B)'$

v.  $(A \cup B)'$

20. In a survey of 290 newspaper readers, 181 of them read the Daily Times, 142 read the Guardian, 117 read Punch and each reads at least one of the three papers. If 75 read the Daily Times and the Guardian, 60 read the Daily Times 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 alone?

21. In a certain class, 22 pupils take one or more of Chemistry, Economics and Government. 12 take Economics (E), 8 take Government (G) and 7 take Chemistry (C). Nobody takes Economics and Chemistry, and 4 pupils take Economics and Government.

(a)

(i). Using set notation and the letters indicated above, write down the two statements in the last sentence.

(ii). Draw a Venn diagram to illustrate the information.

(b) How many pupils take

(i). both Chemistry and Government?

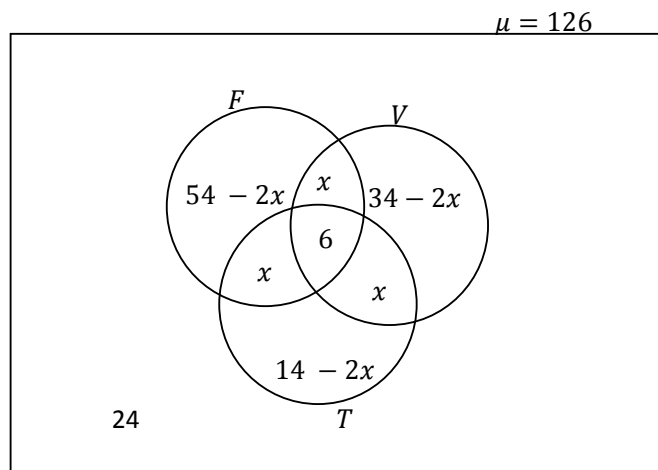
(ii). Government only?

22. Fig 1.0 shows the results of a survey of 126 students, where

$F = \{\text{students who like playing football}\}$

$V = \{\text{students who like playing volleyball}\}$

$T = \{\text{students who like playing tennis}\}$



(a) How many students like playing none of the games ?

(b) How many students like playing football?

(c) What is the value of ?

How many students like playing tennis