FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF MATHEMATICS AND PHYSICS

CERTIFICATE IN INFORMATION COMMUNICATION AND MAINTENANCE

AMA 1152 MATHEMATICS

END OF SEMESTER EXAMINATION

SERIES DECEMBER 2016

TIME 2 HOURS

INSTRUCTIONS TO CANDIDATES

This paper consists of five questions

Answer question one compulsory and any other two questions

Q1.

(a)   i) Convert 2/11 into decimal   **(2marks)**

          ii) Evaluate $5(3 \times 4^2 - 6 \div 7)$ **(2marks)**

          iii) Rationalize

$$\frac{1}{1 + \sqrt{5}}$$ **(2marks)**

b) Add   i) $11011_2 + 1011_2$ **(2marks)**

           ii) $1110_2 + 1011_2$ **(2marks)**

           iii) $1011_2 \times 111_2$ **(2marks)**

    c) Solve

       i) $x = \log_2 16$ **(3marks)**

       ii) $\log x^4 - \log x^3 = \log 3x - \log 2x$ **(3marks)**

d) Given A= $\begin{pmatrix} 3 & 4 \\ 5 & 1 \end{pmatrix}$ and B= $\begin{pmatrix} 7 & 2 \\ 1 & 5 \end{pmatrix}$

     Find i) AB   **(3marks)**

        ii) 3A-5B   **(3marks)**

e) Find the mean and mode of the following data

  75, 70, 65,67,75,74   **(3marks)**

f) Find the sum of the first 12 terms of the series 5+11+17+……

   and the 20th term.   **(3marks)**

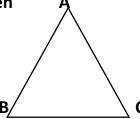**Q2. Convert into decimal**

i) 357.3_8 (3marks)

ii) 2AF3 hexadecimal to decimal (3marks)

b) Solve by quadratic formula $3x^2 + 4x + 1 = 0$ (3marks)

c) Given the series $a+ar+ ar^2+...$ show that $Sn= a(1-r^n)/1-r$ (3marks)

d) Given A A= 53°, B = 61° and B C = 12.6 cm

Find the unknown sides and angle. (3marks)

Q3.

a) Given A $= \begin{pmatrix} 7 & 3 \\ 2 & 5 \end{pmatrix}$

Find i) A^{-1} (3marks)

ii) A^T (2marks)

b) Solve by matrix method

3x+y=5

2x+7y=3 (3marks)

c) Convert into radians

i) 150° (2marks)

ii) 120° (2marks)

d) Show that

i) $1+\tan^2 0=\sec^2 0$ (1mark)

ii) $\cos 2A=2\cos^2 A-1$ (2marks)

Q4.

a) Given the series 1+ ½ + ¼ +…….

Find i) a_5 (1mark)

ii) s_{10} (2marks)

iii) $s\infty$ (2marks)

b) Convert into Octal 492.731_{10} (3marks)

c) Convert into binary given 79_{10} (3marks)

d) A bag contains 5 red and 4 blue balls. Find the probability of picking with replacement, a red and a blue ball by use of a tree diagram. (4marks)

Q5.

a) Given cosA=$\frac{2}{5}$ and that A is acute,

Find the other five trigonometric ratios. (5marks)

b) A is the event of throwing a six when a die is rolled and B is the event of drawing an ace from a pack of playing cards. Find the probability of the event both A and B. (2marks)

c) Solve by substitution

3x+2y=7

2x+5y=4 (2marks)

d) If log3=0.4771 and log2=0.3010, write down

i) log18 (3marks)

ii) log54 (3marks)

In terms of log2 and log3 and hence evaluate.