TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECHANICAL & AUTOMOTIVE ENGINEERING

UNIVERSITY EXAMINATION FOR:

DIPLOMA IN NAUTICAL SCIENCE

ANS 2201 : ELECTRONIC NAVIGATION SYS & MARINE INSTRUMENTS

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 2016

TIME: 2 HOURS

DATE: Pick Date Dec 2016

Instructions to Candidates
You should have the following for this examination
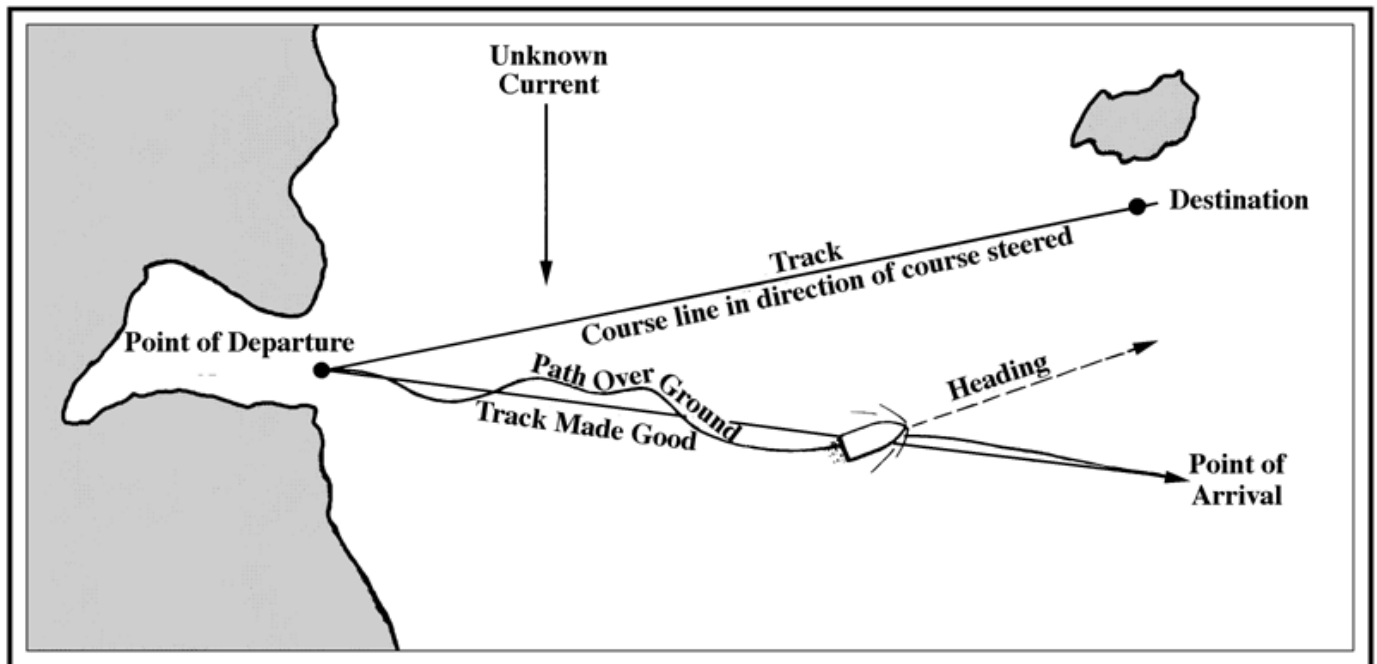   -*Answer Booklet, examination pass and student ID*
This paper consists of **FIVE** questions. Attempt any THREE questions.
Do not write on the question paper.

Question ONE

   a) Using the diagram below derive and discuss the ships direction   **(12 Marks)**

b) Define the following acronyms (8 Marks)
   i. Loran
   ii. GPS
   iii. kHz
   iv. MHz

Question TWO

a) Using an appropriate diagram define and illustrate the following
   i. Longitude (long) (4 Marks)
   ii. Difference of Longitude (DLong.) (4 Marks)
b) Describe and discuss the GPS Signal architecture (12 Marks)

Question THREE

a) Define the term Loran lines of position (LOPs) (2 Marks)
b) Using proper illustrations discuss the assumption that two transmitters A and B simultaneously transmit the same pulse stream. If the distance between the transmitters is 1000 nmiles, calculate the time taken to cover the distance between the transmitters where $(t = d/v.)$ (18 Marks)

Question FOUR

Using the diagram below discuss the space segment of the GPS System (20 Marks)

55° inclination   60°orbital planes
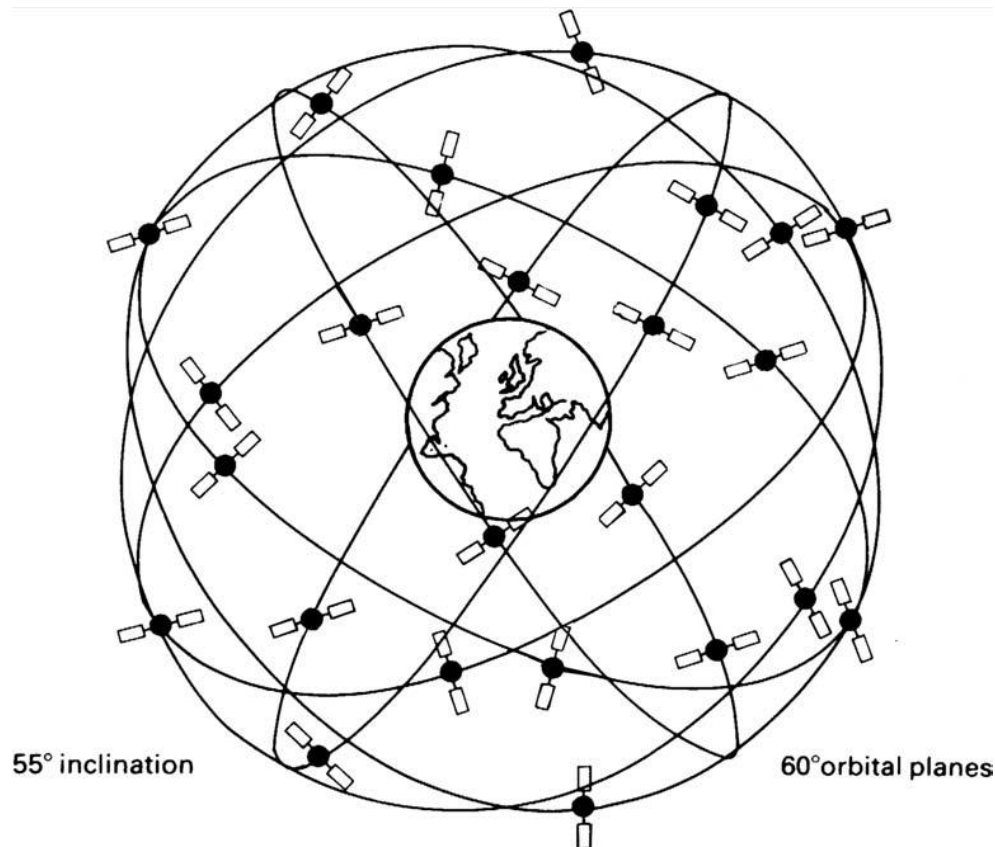
Question FIVE

a) Define the term a hyperbolic navigation system **(2 Marks)**

b) Explain the basis theory of LORAN C navigation system **(10 Marks)**

c) Describe and define the component of LORAN C system **(8 Marks)**