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

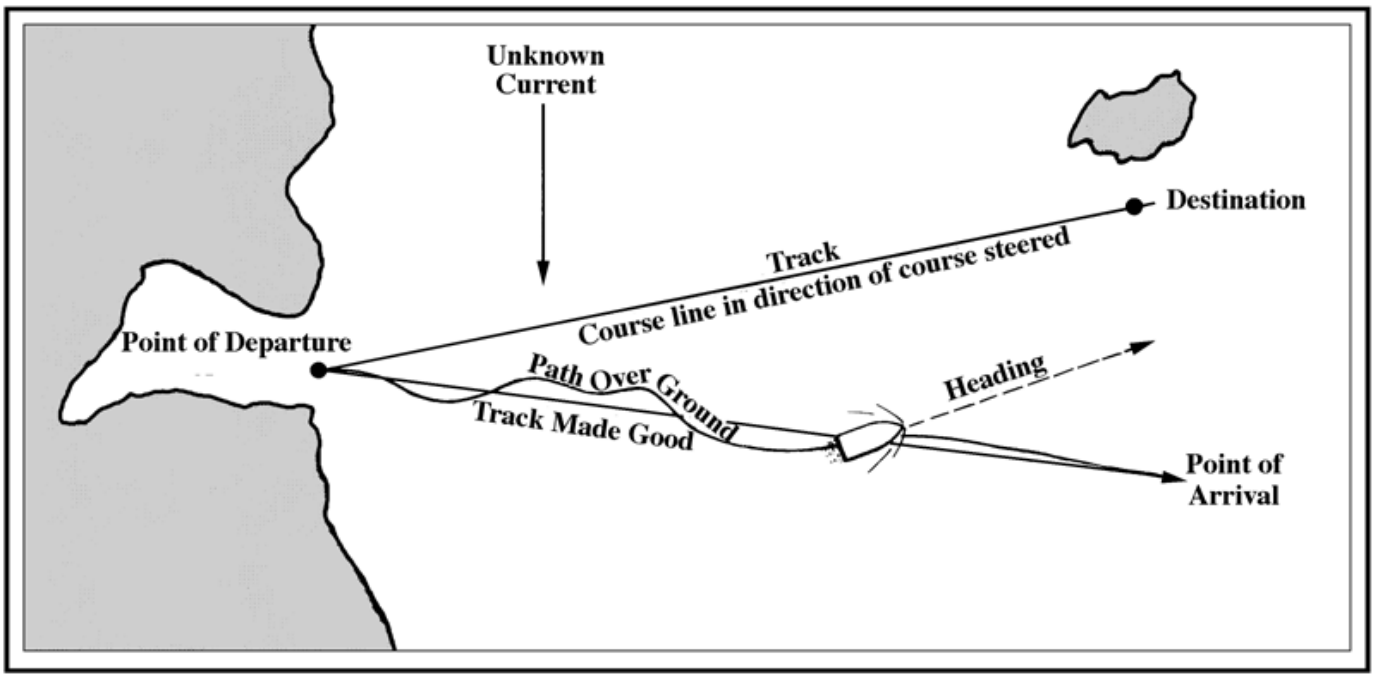
-Answer Booklet, examination pass and student ID

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)**

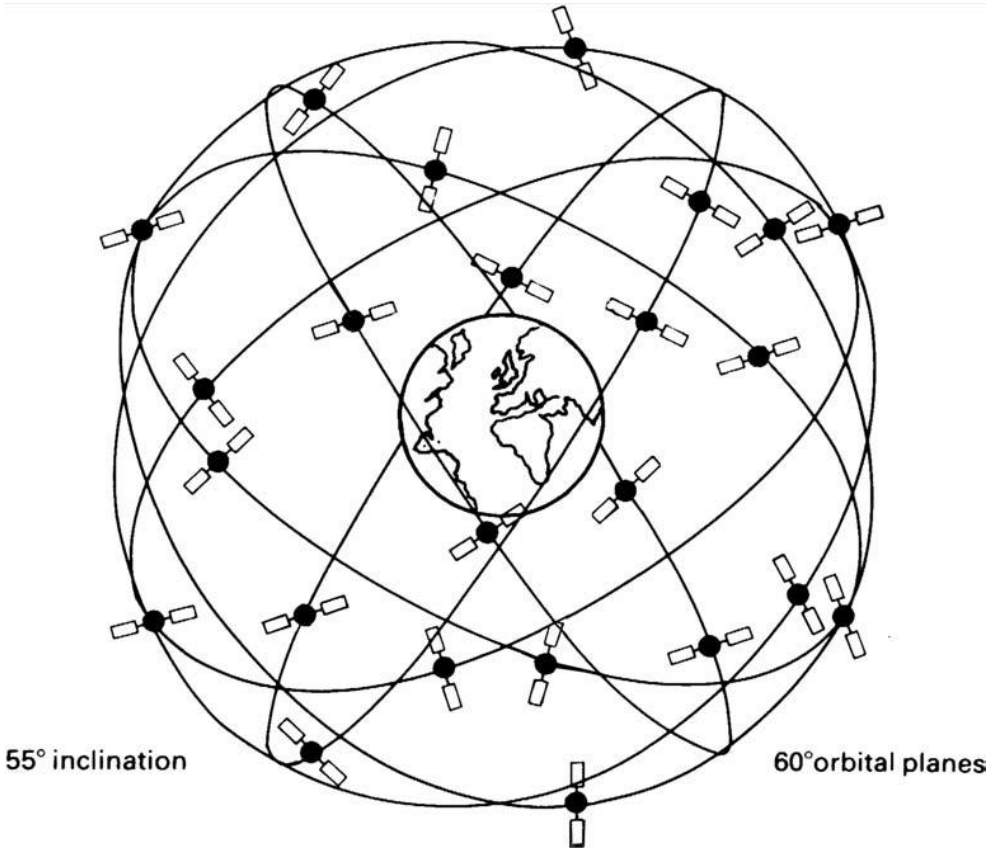
Question THREE

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)**



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)**