EAST AFRICAN SCHOOL OF AVIATION EXAMINATION

END TERM EXAMINATION

ENGINEERING SECTION

SUBJECT: FLIGHT MECHANICS

STREAM: Module III (Airframes & Engines)   **Duration: 3HRS**

DATE:–07/04/2017   **TIME: 09.00 - 12.00**

INSTRUCTION TO CANDIDATES

1. *This paper consists of **TWO (2)** pages*

2. *Answer ALL questions*

1 (a)   A venturimetre has an area ratio of 9 to 1, the larger diameter being 300mm. During the flow, the recorded pressure head in large section is 6.5 metres and that at the throat 4.25 metres. If the metre coefficient (C) = 0.99 compute the discharge through the metre   **(10 marks)**

(b)   A fluid is flowing through a pipe of 100 mm diameter with an average velocity of 10m/s. Determine the velocity of the fluid at the other end of the pipe if the diameter of the pipe is gradually changed to 200mm   **(10 marks)**

2 (a) Define the universal law of gravitation (illustrate your answer)   **(5 marks)**

(b) With the aid of sketches describe the following with regard to satellite and projectiles
     (i)   Apogee
     (ii)   perigee   **(8 marks)**
(c) Outline the procedure for launching a spacecraft to the moon   **(7 marks)**

3 With the aid of sketches describe the construction and operation of the following pitot static instruments

     (i)   Rate if climb indictor
     (ii)   Airspeed indicator
     (iii)   Altimeter
     (iv)   Mach meter   **(20 marks)**

4 (a) Explain the meaning of the following altimeter settings

     (i)   QNH
     (ii)   QFE
     (iii)   QNE   **(6 marks)**

  (b)   Explain the range markings on an air speed indictor   **(14 marks)**

5 (a) Explain the following principles of gyroscopic instruments. illustrate your answer

     (i)   Rigidity in space
     (ii)   Precession   **(8 marks)**

(b)   describe the construction and operation of a gyro- horizon (use a labeled sketch
                                                                                                      (12 marks)