KUMARAGURU college of technology
character is life

Register Number: ……..

B.E DEGREE EXAMINATIONS: JUNE 2015

(Regulation 2013)

Second Semester

AERONAUTICAL ENGINEERING

U13AET201: Elements of Aeronautics

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Which of the following is the greatest factor causing lift?
   a) Increased airflow velocity below the wing
   b) Increased pressure below wing
   c) Suction above the wing
   d) Decreased airflow velocity above the wing
2. The angle between the airflow (relative wind) and the chord line of an aerofoil is_____
3. What primary force is at work on the fuselage when an aircraft is at rest?
   a) Torsion
   b) Tension
   c) Bending
   d) Compression
4. The main purpose of stringers in the semi monocoque design is _____
5. What percent of the air in the combustion chamber actually takes part in the combustion process?
   a) 25%
   b) 25%
   c) 45%
   d) 55%
6. Turbofan engine can be considered as a bridge between_____
7. The first space shuttle was launched in
   a) 1981
   b) 1991
   c) 1961
   d) 1971
8. In _____ ,the propellant to be burned is contained within the combustor
9. Satellites and space stations are used for _____
   a) Communication
   b) Navigation
   c) Research
   d) All of these
10. The purpose of a tail rotor on a single main rotor helicopter is _____

PART B (10 x 2 = 20 Marks)

(Not more than 40 words)

11. Differentiate between Monoplane and Biplane.
12. Name the secondary control surfaces used in an aircraft
13. What are the functions of ribs and spars?
14. Differentiate between monocoque and semi-monocoque construction
15. What is jet thrust?
16. List out the methods of thrust augmentation
17. Define specific impulse of a rocket
18. What is Ramjet engine?
19. What are high lift devices?
20. Differentiate between a gyroplane and a helicopter

PART C (5 x 14 = 70 Marks)

(Not more than 400 words)

Q.No. 21 is Compulsory

21. With neat sketches, explain the principle of operation of turbo-prop and turbofan engines.

22. a) Explain in detail the major components of an airplane and their functions with neat sketches

(OR)

b) (i) Explain the different types of flight vehicles (7)

(ii) Discuss the temperature variation with altitude of standard atmosphere and classify the atmospheric layers (7)

23. a) (i) Write short notes on : Flight loads (4)

(ii) Explain the use of titanium and composite materials in aerospace industry (10)

(OR)

b) (i) Explain the types of fuselage constructions with neat sketches (10)

(ii) Discuss the need of aluminum alloys for aircraft structures. (4)

24. a) Describe a Ramjet engine and compare its working principle with Scramjet engine with neat sketches

(OR)

b) Briefly discuss on the following:

1. Types of rockets (6)
2. Kepler's laws of planetary motion (4)
3. Fuel cells (4)

25. a) (i) Explain the four basic controls of the helicopter (7)

(ii) Write short notes on : UAVs, MAVs and Micro lights (7)

(OR)

b) Explain the basic principles of Aircraft's Hydraulic system, and flight control system with the help of layouts.

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