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BAS-013

B.Tech. AEROSPACE ENGINEERING (BTAE)

Term-End Examination

00133

June, 2018

BAS-013 : PROPULSION – I

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any **seven** questions. All questions carry equal marks. Use of scientific calculator is permitted.*

1. (a) Explain the working principle of Dual cycle with the help of neat and labelled diagrams. *7*

(b) What do you mean by mean effective pressure ? Explain its importance. *3*

2. Distinguish between turbojet and turbofan engines. Explain the working of a turbofan engine with the help of neat and labelled diagram. *10*

3. Distinguish between spark ignition and compression ignition engines. Explain the working of compression ignition engine with the help of neat diagrams. *10*

4. Define the following : *5×2=10*

(a) Mechanical efficiency and overall efficiency

(b) Volumetric efficiency

(c) SHP and IHP

(d) Indicator diagram

(e) Supercharging

5. (a) What is firing order ? How is firing order decided in case of multi-cylinder engines ? *5*

(b) Explain power required and power available curve on the same plot. How do altitude and speed affect power available curve ? Show the variation with the help of plots. *5*

6. (a) Explain splash lubrication system. Mention its merits and demerits over other systems. *6*

(b) Explain engine performance test, keeping the speed of engine constant. *4*

7. A two-stroke engine delivers 7000 kW while using 1500 kW to overcome frictional losses. It consumes 2500 kg of fuel per hour at an air-fuel ratio of 18 : 1. The heating value of fuel is 43000 kJ/kg. Find : *10*

(a) Indicated power,

(b) Mechanical efficiency,

(c) Air consumption per hour,

(d) Indicated thermal efficiency, and

(e) Brake thermal efficiency.

8. (a) Explain the following : *3×2=6*

(i) Convection process

(ii) Emissive power

(iii) Planck's distributive law

(b) Describe in brief 'Radiation Properties'. *4*

9. Write notes on the following : *5+5=10*

(a) Properties of engine lubricants and additives

(b) Types of cooling systems