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BAS-013

B.TECH. IN AEROSPACE ENGINEERING (BTAE)

00535

Term-End Examination

June, 2012

BAS-013 : PROPULSION - I

Time : 3 hours *Maximum Marks : 70*

Note : *All questions **carry equal** marks . Answer **any** 7 **(seven)** questions. Use of scientific calculator is **permitted**. Assume data suitably.*

1. Derive an expression for mean effective pressure of an Otto cycle. **10**

2. Explain working principle of a simple turbojet engine used in aircrafts. **10**

3. Using valve - timing diagram, illustrate functioning of spark ignition (SI) engine. **10**

4. A single cylinder 4 - stroke engine has bore and stroke of 75 mm and 100 mm respectively. If rating of engine is 4 kW at 1500 rpm, find mean effective pressure and torque. **10**

5. What is convective heat transfer ? How it is different from other modes of heat transfer ? Differentiate between natural and forced convection. **10**

6. An Aluminium (k = 202 W/m.k) rod 2.5 cm in diameter and 15 cm long protrudes from a wall which is maintained at 260°C. The rod is exposed to an environment at 16°C. The convective heat transfer coefficient is 15 $W/m^2.k$ calculate heat lost by the rod. Enlist assumptions. **10**

7. Explain functioning of steam cooling system in an automobile engine. **10**

8. What are fuel - air requirements in an SI (Spark ignition) engine ? How do these change with load ? **10**

9. Write short notes on *any two* of the following : **10**
   (a) Specific fuel consumption
   (b) Thermal conductivity
   (c) Engine lubricants.