6. Write short notes on the following :

(a) Free convection heat transfer from sphere-

(b) Plank distributive law and radiation properties. **4,4**

Unit IV

7. Show the various components of a turbojet engine with the help a neat sketch. Explain the function and working of various components. Show the tentative relative variation of pressure, temperature, velocity and thrust for different components. How turbojet is different from turboprop engine ? **2,6,4,3**

8. Distinguish between the following : **5,5,5**

(a) Centrifugal and Axial flow compressors

(b) Simplex and Duplex burners

(c) High and Low bypass turbofan engines.

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E-201

B. Tech. EXAMINATION, Dec. 2017

(Fifth Semester)

(B. Scheme) (Main & Re-appear)

(AER)

AER-301-B

AIRCRAFT PROPULSION-I

Time : 3 *Hours*] [*Maximum Marks :* 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks. Use of scientific calculator is permitted. However, the use of programmable calculator and

mobiles is prohibited. Make suitable assumptions wherever necessary and state them clearly.

Unit I

1. (a) Distinguish between 2-stroke and 4-stroke engines. Explain the working of a 2-stroke eingine with the help of sketches. **4,5**

(b) Discuss the effect of speed altitude on the performance of piston engine aircraft. **2,4**

2. Explain the following : **5×3**

(a) Historical review of internal combustion engines

(b) Working of CI engines

(c) Superchargers and their types.

Unit II

3. (a) Distinguish between ducted propeller and prop-fan. Explain this use with examples. **6**

(b) What do you understand by fixex pitch, variable pitch and constant speed propellers ? List their merits, demerits and applications. **3,6**

4. (a) Explain the criteria for the selection of propeller used for propeller aircraft. **5**

(b) Distinguish between 'Blade element theory' and 'Vortex theory'. Derive the expression for propeller thrust using blade element theory. **5,5**

Unit III

5. (a) Define heat conduction and thermal conductivity. Derive the general two-dimensional equation of heat conduction. **4,5**

(b) Write a note on 'Thermal radiation and Emissive power'. **6**