Roll No. | | | | | | | | | | | | |

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ANE) (Sem.–4)

AIRCRAFT PROPULSION – I

Subject Code : ANE-208

M.Code : 60516

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION–A

1) Answer briefly : **2×10=20**

a. What are the parameters which influences heat conduction/ heat convection?

b. What is thermal conductivity?

c. Can thermal conductivity be negative? Justify your answer.

d. Define Prandtl number.

e. Define activity factor.

f. What is the difference between S.I engine and C.I engine?

g. What is break horse power?

h. Which thermodynamic cycle does a gas turbine engine follow?

i. What limits the usage of propeller aircrafts at sonic speeds and above?

j. Although combustion inside a realistic diesel cycle is non-isobaric, it is considered to be isobaric in ideal cycle. Why?

SECTION-B

2) Two infinite black plates at 500°C and 100°C exchange heat by radiation. Calculate the heat- transfer rate per unit area. If another perfectly black plate is placed between the 500 and 100°C plates, what is the percentage reduction in the heat transfer? What is the temperature of the center plate? [2+1+2]

3) Obtain a relation for efficiency of an air-standard Diesel cycle. [5]

4) While performing static tests, a compressor is operating at pressure ratio of 4 and isentropic efficiency of 0.85, find the compressor exit temperature if the temperature of the incoming air is 288K. What is the power required by this compressor if the mass flow is 10kg/S? [5]

5) Through Blade Element Theory, obtain a relation for lift over a helicopter blade. [5]

6) Mention the property variation across an oblique shock on a neat diagram. [5]

SECTION-C

7) Explain in detail the complete operation of lubrication system of an aircraft piston engines. [10]

8) Explain in detail the working of ignition system of a multi-cylinder aircraft piston engines. [10]

9) Obtain a relation for efficiency of a turbine following a polytropic process. [10]

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.