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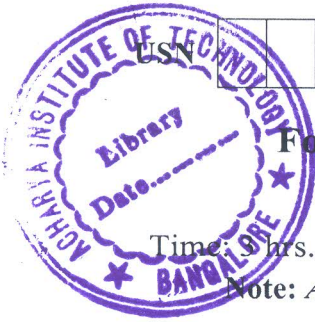
15AE43

Fourth Semester B.E. Degree Examination, Aug./Sept. 2020
Aircraft Propulsion

Time: 3 hrs.

Max. Marks: 80

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1 a. Explain Ist and IInd law of thermodynamics. **(08 Marks)**
   b. Explain the different types of power plants. **(08 Marks)**

OR

2 a. With a neat sketch, explain the working principle of internal combustion engine. (Reciprocating engine). **(08 Marks)**
   b. Explain the following : i) Stagnation pressure ii) Stream tube iii) Compressible and incompressible flow iv) Mach number v) Reyonld's number. **(08 Marks)**

Module-2

3 a. List the differences between turboprop and turbo fan engine. **(08 Marks)**
   b. Explain the methods of thrust augmentation with neat sketch. **(08 Marks)**

OR

4 a. Explain the block element theory with appropriate diagram. **(08 Marks)**
   b. Discuss briefly about the types of propeller blades. **(08 Marks)**

Module-3

5 a. Describe briefly about the starting problem in supersonic inlets and explain the phenomenon of shock swallowing. **(08 Marks)**
   b. Explain the different modes of inlet problem with neat sketch. **(08 Marks)**

OR

6 a. Explain briefly about the types of nozzles used in aircraft engine. **(08 Marks)**
   b. Explain the methods of thrust reversal used in aircraft's engine. **(08 Marks)**

Module-4

7 a. Explain the performance characteristics of centrifugal compressor with neat sketch. **(08 Marks)**
   b. Discuss why diffusers are necessary in a centrifugal compressor and briefly explain the different types of the same with neat sketch. **(08 Marks)**

OR

8 a. List the comparisons of axial and centrifugal flow compressors. **(08 Marks)**
   b. Sketch and explain the velocity triangles for a axial flow compressor stage. **(08 Marks)**

Module-5

9 a. Explain the different zones in the combustion chamber with neat sketch. **(08 Marks)**
   b. List the important factors affecting the combustion chamber design. **(08 Marks)**

OR

10 a. Explain the classification of turbine stage with neat sketch. **(08 Marks)**
    b. Explain the thermodynamics of radial turbines with neat sketch. **(08 Marks)**

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