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EAE052

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 148852

Roll No.

B. Tech.

(SEM. VIII) THEORY EXAMINATION, 2014-15

STRUCTURAL DESIGN & TESTING

Time : **3** Hours] [Total Marks : **100**

Note : Answer all five questions.
(Choice and marks are indicated below)

1 Answer any two parts of the following : **2×10=20**

(a) Briefly describe the classification of airplanes in terms of power plants and configuration.

(b) Describe the following terms :

(i) Maximum speed

(ii) Maximum range

(iii) Reynolds No.

(iv) Mach No.

(v) Rate of climb.

(c) Describe the method for positioning of wings and engines for supersonic airplanes.

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2 Answer any two of the following : **2×10=20**

(a) How many types of landing gears are there? Describe a landing gear system of an aircraft.

(b) Describe the following :

(i) Dehedral

(ii) Monocoque construction

(iii) Braced cantilevers

(iv) Tubular fuselage construction

(v) Taper twist ratio.

(c) What is Total drag ? Describe the following drags :

(i) parasite drag

(ii) induced drag

(iii) wave drag

(iv) skin friction drag

(v) interference drag.

3 Answer any two of the following : **2×10=20**

(a) Briefly describe the weight and balance of an aircraft with the help of graph.

(b) Describe the method of calculation of cg.

(c) Describe the following :

(i) weight breakdown

(ii) total take off weight

(iii) payload

(iv) location of tailwing

(v) material used in aircraft construction.

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4 Answer any two of the following : **2×10=20**

(a) Briefly describe the method of selection of tail and wing surfaces.

(b) What are the various aerodynamic considerations while designing an aircraft?

(c) What is stability of aircraft ? Describe the longitudinal stability and control criterias.

5 Answer any four of the following : **4×5=20**

(i) Flight Testing procedures

(ii) Structural layout of airplane

(iii) Project feasibility studies

(iv) History and development of airplanes

(v) Location of Tail surfaces.