Model Question Paper-1/2 with effect from 2022-23 (CBCS 2022 Scheme)

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Third Semester <u>Aeronautical Engineering</u> B.E. Degree Examination

[Elements of Aeronautics]

TIME: 03 Hours   **Max. Marks: 100**

Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.

Question No.		Description	Bloom's Taxonomy Level	CO	Marks
Module 1					
01	(a)	Explain the parts of Helicopters and their functions.	L1	CO 1	8
	(b)	Describe about the primary and secondary control surfaces with suitable diagrams.	L2	CO 1	12
(OR)					
02	(a)	Write a short notes on Fuselage construction with neat diagram.	L1	CO 1	10
	(b)	Write the uses of various materials in aircraft construction.	L1	CO 1	10
Module 2					
03	(a)	Explain about the NACA 2411 airfoil nomenclature with clear diagram.	L3	CO 2	10
	(b)	Discuss about the pressure distribution over an airfoil and wing with neat ketch.	L2	CO 2	10
(OR)					
04	(a)	Define (i) Centre of Pressure (ii) Aerodynamic Center (iii) Mach Number (iv) Aspect Ratio	L1	CO 2	10
	(b)	Consider an aircraft with wing area 206 m^2, an aspect ratio of 10, a span effectiveness factor of 0.95 and NACA 4412 airfoil. The weight of the airplane is 7.5×10^5 N. If the density altitude is 3 km and the velocity is 100 m/s. Calculate the total drag.	L3	CO 2	10
Module 3					
05	(a)	Write the general classification of the aircraft Power plants.	L2	CO 2	4
	(b)	Describe the principle of operation of turboprop, turbojet, turboshaft and turbofan engine with neat diagrams.	L2	CO 2	16
(OR)					
06	(a)	Explain the Brayton Cycle with neat graph.	L2	CO 2	8
	(b)	Define thrust Augmentation and discuss the various types of thrust augmentation with neat sketch.	L2	CO 2	12
Module 4					

07	(a)	Describe the different types of static and dynamic stability with neat diagram.	L2	CO 3	8
	(b)	Write the short notes on stalling, gliding, landing and turning of an aircraft.	L2	CO 3	12
(OR)					
08	(a)	Discuss the power curves of an aircraft engine and the effect of changes of engine power in the aircraft.	L2	CO 3	10
	(b)	Write a short notes on aerobatics and inverted maneuver of an aircraft.	L2	CO 3	10
Module 5					
09	(a)	Write a short notes on hydraulic and pneumatic system. Mention their applications in an aircraft.	L2	CO 3	10
	(b)	Discuss the environment control system, fuel system and oxygen system of an aircraft.	L2	CO 3	10
(OR)					
10	(a)	Describe the flight control system and navigation system in an aircraft with neat sketch.	L2	CO 3	10
	(b)	Write the short notes on various power generation systems of an aircraft.	L2	CO 3	10

Model Question Paper-2/2 with effect from 2022-23 (CBCS 2022 Scheme)

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[Elements of Aeronautics]

TIME: 03 Hours   Max. Marks: 100

01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.

Question No.	Description	Bloom's Taxonomy Level	CO	Marks
Module 1				
01 (a)	Describe about the basic components of an aircraft and its structural members.	L1	CO 1	12
(b)	Classify the types of aircrafts. Draw a neat flow chart and explain them in detail.	L2	CO 1	8
(OR)				
02 (a)	Discuss the various metallic and non-metallic materials used in aircraft.	L1	CO 1	10
(b)	Write a short notes on aircraft wing and fuselage structure.	L2	CO 1	10
Module 2				
03(a)	Derive the Relation between Temperature, Pressure, density and altitude with the help of standard atmosphere temperature variation graph.	L2	CO 2	12
(b)	Explain the Bernoulli's theorem and its application for the generation of lift	L2	CO 2	8
(OR)				
04(a)	Define drag. Discuss about the types of drag	L1	CO 2	10
(b)	Define (i) Centre of Pressure (ii) Aerodynamic Center (iii) Mach Number (iv) Aspect Ratio	L1	CO 2	10
Module 3				
05 (a)	Classify the aircraft Power plants based on location.	L2	CO 2	4
(b)	Describe the principle of operation, merits and limitations of turboprop, turbojet, and turbofan engine with neat diagrams.	L2	CO 2	16
(OR)				
06 (a)	Explain the different processes takes place in Brayton Cycle with neat graph.	L2	CO 2	8
(b)	Define thrust Augmentation and discuss the various types of thrust augmentation with neat sketch.	L2	CO 2	12
Module 4				
07 (a)	Discuss on longitudinal, lateral and directional stability of an aircraft. And give necessary conditions for the longitudinal stability.	L3	CO 3	12

(b)	Explain the effect of flaps and slats on lift with proper graph.	L2	CO 3	8
	(OR)			
08 (a)	Write a short notes on correct and incorrect angles of bank.	L2	CO 3	10
(b)	Explain turning of an aircraft. Find the correct angle of bank for an aircraft travelling on a circle of radius 120m at a velocity of 53 m/s.	L3	CO 3	10
	Module 5			
09 (a)	Write a short notes on hydraulic and pneumatic system. Mention their applications in an aircraft.	L2	CO 3	10
(b)	Discuss the environment control system, fuel system and oxygen system of an aircraft.	L2	CO 3	10
	(OR)			
10(a)	Briefly explain about (i) Communication system (ii) Cockpit instrumentation and displays.	L2	CO 3	10
10(b)	Write a short notes on power conversion, distribution and management.	L2	CO 3	10