MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF AERONAUTICAL ENGINEERING

IV B.TECH II SEMESTER

R18 SUPPLEMENTARY PREVIOUS QUESTION PAPERS

LIST OF SUBJECTS

CODE	NAME OF THE SUBJECT
R18A2139	Helicopter Engineering
R18A2120	Aircraft Maintenance Engineering
R18A2142	Airline and Airport Management

ur kanna k

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

IV B.Tech- II Semester Regular Examinations, May 2022

Helicopter Engineering

(AE)

Roll No					

Time: 3 hours

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

Max. Marks: 70

SECTION-I

1 Draw the various configurations of helicopter and explain each briefly. [14M]

OR

2 How articulation of provided to helicopter rotor blades? Explain with simple schematics of hinges.

[14M]

SECTION-II

- **3** (a) Draw a schematic and show the forces acting on a helicopter during various **[8M]** modes of flight.
 - (b) What are the limits of helicopter operation? Discuss briefly.

[6M]

A helicopter with a gross weight of 1363.6 kg, a main rotor radius of 4.0m and a rotor [14M] tip speed of 207.3 *m/s* has 205 KW delivered to the main rotor shaft, tail rotor radius is 0. 701 m, and the tail rotor is located 4.66 m from the main rotor shaft.For hovering condition at sea level, compute: (i) the rotor disk loading (ii) the ideal power loading (iii) the thrust and torque co-efficient (iv) the figure of merit and actual power loading and (v) thrust and power required by the tail rotor. Assume that the figure of merit of the tail rotor is 0.70.

SECTION-III

5 With the help of induced velocity curve, explain in detail various working states of a [14M] rotor in vertical flight.

OR

6

7

(a)	Define ground effect by stating what causes it. How ground effect affects	[6M]
	power required.	
(b)	Obtain the expression for power required in climb	
		[8M]

SECTION-IV

(a)Define retreating blade stall by stating its cause and the effects on	[7M]
helicopterflight. State the solution to retreating blade stall.	
(b)Define compressibility effect by stating its cause and the effects on helicopter	
flight. State the solution to compressibility effect.	[7M]

OR

8 A helicopter with gross weight of 1600 kg, a main rotor radius of 6m, and a rotor tip [14M] speed of 220 m/s has 225 kW delivered to the main rotor shaft, the tail rotor radius is 0.8 m and the tail rotor is located 5 m from the main shaft, Calculate the thrust and power required by the tail rotor for hovering conditions at 7500 ft. Assume that the FM of the tail rotor is 0.70. Also estimate the power required for level flight at a speed of 20 m/s at sea level using momentum theory. Taking C_D = 0.0065 based on rotor disc area.

SECTION-V

9 Define the term static and dynamic stability of a helicopter. Is a statically stable **[14M]** helicopter, dynamically stable? Explain.

10	(a) With neat sketches discuss the rotor static stability with speed and angle of attack.	[7M]
	(b) Discuss in detail the longitudinal stability of a helicopter in forward flight.	
		[7M]

R18

Code No: R18A2120

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

IV B.Tech- II Semester Regular Examinations, May 2022

Aircraft Maintenance Engineering

(AE)

Roll No					

Time: 3 hours

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

1	Explain the following briefly:	
	(a) Process – Oriented maintenance	
	(b) Task- oriented maintenance	[7M]
		[7M]

OR

2 Explain in detail about establishing a maintenance program in aircraft industry. [14M]

SECTION-II

3	Why aircraft ce	ertification is re	equired? Explai	in in detail.	[14M
	J		1 1		

Max. Marks: 70

	OR	
4	Explain the following briefly:(i) ATA document standards(ii) Airline generated documentation	[7M] [7M]
	SECTION-III	
5	Explain about the airframe manufacturers training course and airline maintenance training.	[14M]
6	Explain about multiple checks in production planning.	[14M]
•	SECTION-IV	[=]
7	Explain the following briefly:	
	(i) Line maintenance operations, and(ii) Ramp and terminal operations,	[7M] [7M]
	OR	
8	What are the problem areas of hangar maintenance? Brief about operation of overhaul shops.	[14M]
	SECTION-V	
9	Write short notes on the following:	
	(i) Statistical reliability	[7M]
	(ii) Dispatch reliability.	[7M]
	OR	
10	Explain about ISO-9000 quality standards in aircraft maintenance management	[14M]

Code No: R18A2142

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

IV B.Tech- II Semester Regular Examinations, May 2022

Airline and Airport Management

(AE)

Roll No					

Time: 3 hours

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

Max. Marks: 70

SECTION-I

1	1 Explain about different hub classifications described in NPIAS. [:				
	OR				
2	What are the principal duties of a typical airport manager at a medium size commercial airport?	[14M]			
	SECTION-II				
3	Explain the airport operations management under FAR Part 139.	[14M]			
	OR				
4	Write short notes on the following:				
	(i) Airport terminals, and	[7M]			
	(ii) Ground access				

) Ground access [7M]

SECTION-III

5	What are the revenue strategies at commercial airports? Explain briefly.	[14M]
6	How the capacity of an airport is defined? What are the various factors effecting it? SECTION-IV	[14M]
7	Explain the structure of domestic and international airline industry.	[14M]
8	 Write short notes on the following: (i) Economic characteristics of the Airlines (ii) Airline Planning Process 	[7M] [7M]
9	<u>SECTION-V</u> Briefly explain the factors to be considered in Fleet Planning. OR	[14M]
10	Explain in detail about the Hub and Spoke System.	[14M]
