

CBCS SCHEME

15AE743

Seventh Semester B.E. Degree Examination, Jan./Feb. 2021 **Helicopter Dynamics**

Time: 3 hrs.

Max. Marks: 80

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

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ctic			Waltela 1	
lpra			Module-1 Deliver of the Threat and Power Coefficient	(08 Marks)
; ma	1	a.	Derive an expression for Thrust and Power Coefficient. Explain Rotor Solidity ratio, blade loading and Figure of Merit.	(08 Marks)
d as		b.	Explain Rolor Solidity land, blade loading and Figure of West.	(00 1.11111)
g blank pages. = 50, will be treated as malpractice.			OR	
es. oe tr	2	a.	Define Disc Loading, Power Loading.	(08 Marks)
pag vill l	4	b.	Derive an expression for equilibrium about flapping Hinge.	(08 Marks)
On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Any revealing of identification, appeal to evaluator and /or equations written eg, $42+8=50$, will be		0.		
g bl			Module-2	
inin 2+8	3	a.	What is Ground Effect?	(08 Marks)
ema g, 4		b.	Explain Helicopter turning with and without coning of the rotor blades.	(08 Marks)
On completing your answers, compulsorily draw diagonal cross lines on the remaining Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8				
on th			OR	(00 M/LI)
ns v	4	a.	What is the effect of Gross Weight during forward flight?	(08 Marks)
s lin atio		b.	What is Auto Rotation?	(08 Marks)
cros			M. d. l. 2	
nal /or	_		Module-3 Effect of Reynold's number and Mach number on rotor air foil dynamics.	(08 Marks)
iago and	5	a.	Discuss Potentials in forward flight	(08 Marks)
w d ator		b.	Discuss Rotor wake in forward flight.	
dra ⁄alu			OR	
orily to ev	6	a.	What are the flow visualization technique used to find rotor wakes?	(08 Marks)
ulsc eal t	U	b.	What is vortex perturbation and instability?	(08 Marks)
app		0.	What is voted persons	
s, co			Module-4	
swer	7	a.	Discuss forward speed disturbance.	(08 Marks)
ans		b.	Discuss tail rotor control.	(08 Marks)
your f ide				
ng o			OR	(00 Marks)
plet	8	a.	Discuss static stability of Helicopter.	(08 Marks) (08 Marks)
com		b.	Discuss main rotor control.	(00 Marks)
On c			Modulo 5	
2.	0		Module-5	(08 Marks)
	9	a.	Discuss the empenage of helicopter. What is NOTAR?	(08 Marks)
Ž.		b.	what is NOTAK?	
rtan			OR	
Important Note	10	a.	Explain the factors affecting the rotor diameter and tip speed of Main Rotor.	(08 Marks)
-T	10	b.	- 1:1 - 1 - 1 - 1 - 1 - 1	(08 Marks)
		0		