School of Aeronautics (Neemrana)

Question Paper For Back / Re-back Internal Assessment Examination (Theory) - Old Scheme i.e 2012 Syllabus

Instructions For Students / Faculty

Back / Re-back Internal Examination (Total 60 Marks, 2 Hrs, Syllabus From Beginning of The Session)

Total number of questions to be given are 10, each carrying 10 marks and it is compulsory to attend 2 questions from Part A and 4 questions from Part B. There is a choice of two questions out of four in part A and 4 questions out of 6 in Part B. Part A will be theoretical or derivation type **(Not More Than 70 Words For Question).** Part B will be fully numerically oriented questions **(Not More Than 70 Words For Question)**, except for the list of subjects given below. No objective type or fill in the blanks shall be given, but subpart of question can be given for both Part A & B.

* **LIST OF ELABORATIVE THEORY QUESTION SUBJECTS**: Aircraft Materials, Aircraft System, Aircraft Rules & Regulation-I, Mechanics of Composite Materials, Aircraft Design, Aircraft Rules & Regulation-II, Avionics-I, Helicopter Theory, Maintenance of Airframe and System Design, Avionics-II, Airlines and Airport Management, Maintenance of Power Plant & Systems

FACULTY MEMBERS, PLEASE ENSURE EXCEPT ABOVE LISTED SUBJECTS, NO THEORITICAL ELABORATIVE QUESTION SHOULD BE GIVEN IN PART 'B' OF QUESTION PAPER

STUDENT IS ALLOWED TO ENTER LATE NOT MORE THAN 15 MIN AFTER STARTING OF EXAM, AND MAY LEAVE THE EXAM HALL ON EXPIRY OF ATLEAST OF 1 Hr FROM THE STARTING TIME OF EXAMINATION

Question Paper & Student Details

Name of Faculty*	Sidhartha Sondh	**Date of Submission of QP**	26/11/2020
Subject*	4MH2 - Dynamics of Machinery (Old)	**Date of Examination***	03/12/2020
Email Id of Faculty:*	sidharthasondh@soaneemrana.org	**Course***	B.Tech (Mechatronics Engineering)
Phone Number of Faculty*	963 455 7511	**Semester***	Semester : 4

Student Name		**Student Reg No.**	

Part A

Question : 1* Explain the significance of degree of freedom.

Lesson Plan*	7	**Topic***	Degree of freedom	**Source***	Self

Question : 2*

What are centrifugal governor? How do they differ from inertia governor?

Lesson Plan* 28 **Topic*** Governor **Source*** Self

Question : 3*

Explain in detail about D Alembert principle. What is the use of it?

Lesson Plan* 4 **Topic*** D Alembert Principle **Source*** Self

Question : 4*

What are the conditions for a body to be in equilibrium under the action of (a) two forces, (b) two forces and torque?

Lesson Plan* 16 **Topic*** Force Analysis **Source*** Self

Part B

Question : 1*

The pistons of a 60° twin V-engine has strokes of 120 mm. The connecting rods driving a common crank has a length of 200 mm. The mass of the reciprocating parts per cylinder is 1 kg and the speed of the crank shaft is 2500 r.p.m. Determine the magnitude of the primary and secondary forces.

Lesson Plan* 22 **Topic*** Balancing **Source*** Previous year questions

Question : 2*

Derive the relation for magnification factor in case of forced vibration.

Lesson Plan*	11	**Topic***	Forced Vibration	**Source***	Self

Question : 3*

A mass of 10 kg is suspended from one end of a helical spring, the other end being fixed. The stiffness of the spring is 10 N/mm. The viscous damping causes the amplitude to decrease to one-tenth of the initial value in four complete oscillations. If a periodic force of 150 cos 50 t N is applied at the mass in the vertical direction, find the amplitude of the forced vibrations. What is its value of resonance ?

Lesson Plan*	18	**Topic***	Resonance	**Source***	Previous year questions

Question : 4*

A, B, C and D are four masses carried by a rotating shaft at radii 100, 125, 200 and 150 mm respectively. The planes in which the masses revolve are spaced 600 mm apart and the mass of B, C and D are 10 kg, 5 kg, and 4 kg respectively. Find the required mass A and the relative angular settings of the four masses so that the shaft shall be in complete balance.

Lesson Plan*	14	**Topic***	Balancing	**Source***	Previous year questions

Question : 5

Derive the relation for the displacement of mass from the equilibrium position of the damped vibration system with harmonic forcing.

Lesson Plan	20	**Topic**	Forced Vibration	**Source**	Self

Question : 6

A vertical petrol engine 150 mm diameter and 200 mm stroke has a connecting rod 350 mm long. The mass of the piston is 1.6 kg and the engine speed is 1800 r.p.m. On the expansion stroke with crank angle 30° from top dead center, the gas pressure is 750 kN/m2. Determine the net thrust on the piston.

Lesson Plan	32	**Topic**	Force analysis	**Source**	Previous year questions

Upload Scanned Document In Case of Numerical or Diagram for any of the above question

Mention question number with relevant fig / numerical / equations. Max 150 KB

Choose files or drag here

I have scrutinized the question paper. There is no spelling mistake or any type of irrelevant question.