Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E. SEMESTER I (old course)–EXAMINATION (Remedial) – WINTER 2015

Subject code: 710902 **Date: 09/12/2015**

Subject Name: DYNAMICS OF MACHINERY

Time: 10:30 AM to 1:00 PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	What are the advantages of and disadvantages of vibration? Explain briefly the different methods used for vibration analysis.	**07**
	(b)	What do you mean by vibration isolation and force transmissibility?	**07**
Q.2	**(a)**	What do you mean by control system? State the various types of standard input functions are used in control systems explaining any one of them in detail.	**07**
	(b)	Write a short note on Signal Flow Graph. Also discuss about Masonôs gain rule with suitable example.	**07**
		OR	
	(b)	What do you meant by stability of a control system? State the different criteria used to investigate the stability of the control system. Explain any one of them.	**07**
Q.3	**(a)**	(i) What is the difference between sound and noise?	**02**
		(ii)Explain about the major sources and effects of noise?	**05**
	(b)	Discuss various methods used in controlling industrial noise.	**07**
		OR	
Q.3	**(a)**	Discuss about the auto correlation functions and their properties.	**07**
	(b)	Explaining the terms Sound power level, Sound pressure level and sound intensity level, establish the relationships between them.	**07**
Q.4	**(a)**	Discuss about the mathematical modelling of cam-follower system considering elasticity of cam and follower.	**07**
	(b)	With neat sketch, explain the phase plane method for analysis of the jump phenomenon in case of cam-follower system.	**07**
		OR	
Q.4	**(a)**	Define the following terms: (i) Position error, (ii) Follower command, (iii) Follower response, (iv) Jump speed, (v) Cross over shock, (vi) Spring surge, (vii) Spring wind up.	**07**
	(b)	Explain Johnsonôs numerical analysis method used for cam dynamics.	**07**
Q.5	**(a)**	Derive the suitable expression of transverse vibration for the beam of length l with uniform cross section carrying a uniformly distributed load and simply supported at both the ends with usual notations. Also derive the natural frequency relationship for the same.	**07**
	(b)	Investigate the stability of the system whose characteristic equation is $s^6 + 2s^5 + 4s^4 + 7s^3 + s^2 - 5s + 4 = 0$, by using Routh method.	**07**
		OR	

Q.5	**(a)**	State and justify the assumptions made for the governing equation of acoustic sound wave. What are the major considerations made for deriving the equation?	**07**
	(b)	What is the difference between expressions of jump speed in case of rigid cam and elastic cam? ï explain briefly.	**07**

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