(4M)

Subject Code: G1504/R13 M. Tech -I Semester Regular Examinations, March, 2014 **MECHANICAL VIBRATIONS** (Common to MD, MED and CAD/CAM) Max Marks: 60

Time: 3 Hours

Answer any FIVE questions All questions carry EQUAL marks ****

- 1. a) Differentiate between free vibrations and forced vibrations?
 - b) Derive an expression for vibration response of a single degree of freedom system if the damping provided is over damped system. (8M)
- 2. Find the normal modes of the system shown in Fig. 1. Assume $k_1=k_2=k$ and $m_1=m_2=m(12M)$



3. Determine the natural frequencies and mode shapes of the system shown in the Fig.2. Assume m1=m2=m3=m and k1=k2=k3=k0(12M)



1 of 2

Subject Code: G1504/R13

4. A three rotor system shown in Fig.3 as following physical constants. $I_1 = 50$ kg-cm- s^2 , $I_2 = 100$ kg-cm- s^2 , $I_3 = 70$ kg-cm- s^2 , $k_{t1} = 2.2 \times 10^6$ kg-cm/rad, $k_{t2} = 0.8 \times 10^6$ kg-cm/rad. Find the natural frequencies of the system. (12M)



- 5. Derive the wave equation of a transverse vibration of a string and obtain its solution.(12M)
- 6. Find the lowest natural frequency of vibration of system shown in Fig.4 by Rayleigh's method. Assume $E= 1.96 \times 10^{11} N/m^2$, $I=4 \times 10^{-7} m^4$. (12M)



- 7. A right cantilever steel shaft of 0.3m effective length has a heavy rotor fixed at its end. The mass of the rotor is 10kg and has a radius of gyration of 12cm about its axis. The thickness of the rotor is 6cm. The moment of inertia of the section of the shaft about its neutral axis is $10cm^4$ this shaft is to run at 10,000rpm. Check if this operating speed is safe. (12M)
- 8. a) What are the principles on which a Vibrometer and an accelerometer are based ? (6M)b) Discuss Seismic instrument with help of a sketch? (6M)

2 of 2

www.FirstRanker.com

Subject Code: G6806/R13 M. Tech –I Semester Regular Examinations, March, 2014 DIGITAL SYSTEM DESIGN (Common to VLSI&ES,ES&VLSI,VLSID&ES,ES&VLSID,VLSI,VLSID,VLSISD,VLSI&ME, ES, DE&CS and E&CE)

Time: 3 Hours

Max Marks: 60

Answer any FIVE questions All questions carry EQUAL marks ****

- 1. a) Briefly explain the CAMP-II algorithm with one example[6+6]b) Explain the difference between cube based algorithm and CAMP-I algorithm
- 2. a) determine the minimal sum-of-product form for the expression and give the tabular method for
 - $f(w,x,y,z) = \sum (0,2,4,9,11,13,15,15) + \sum_{\Theta} (1,5,7,10)$
 - b) Explain the advantages and disadvantages of QM algorithm [6+6]
- 3. a) Realize F1 and F2 using PLA. Give the PLA table and internal connection diagram for the PLA $F_1(a,b,c,d)=\sum_m(1,2,4,5,6,8,10,12,14)$ $F_2(a,b,c,d)=\sum_m(2,4,6,10,11,12,14,15)$
 - b) Explain the difference between PLA and PAL with advantages of both [6+6]
- 4. a) draw the block diagram of PLA and give the Design aspects in a PLA [6+6]b) Give the diagram of three inputs, five product terms and four outputs of PLA structure
- 5. a) Draw the flowchart for Dice game and explain its operation with SM chart [6+6]b) Explain the difference between flowchart and SM chart with symbols
- 6. a)explain the terms (i) fault diagnosis (ii)fault detection (iii)test generation [6+6]b) Define Kohavi algorithm? Explain this algorithm with one example
- 7. a) Explain the concept Fault detection and location in Sequential circuits [6+6]b) Explain the circuit test approach concept in sequential circuits
- 8. write short notes on following [3X4=12] (a) Design for Testability
 - (b) built in self-test
 - (c) PLA folding algorithm
