

Subject Code: G1504/R13

M. Tech – I Semester Regular/Supplementary Examinations, April, 2015
MECHANICAL VIBRATIONS

(Common to MD, MED and CAD/CAM)

Time: 3 Hours

Max Marks: 60

Answer any FIVE questions
All questions carry EQUAL marks

1. a) Discuss in detail what are main causes of vibration.
b) Derive an expression for vibration response of a single degree of freedom system if the damping provided is over damped system.
2. Find the natural frequencies and first two normal mode shapes of the system shown in Fig. 1. Assume $k_1=k_2=k$ and $m_1=m_2=m$

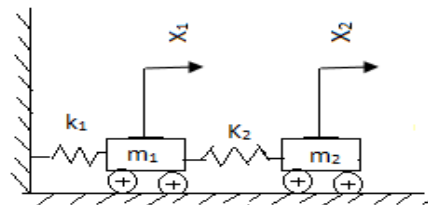


Fig.1

3. Determine the natural frequencies of the system shown in the Fig.2. Assume $m_1=m_2=m_3=m$ and $k_1=k_2=k_3=k_4=k$

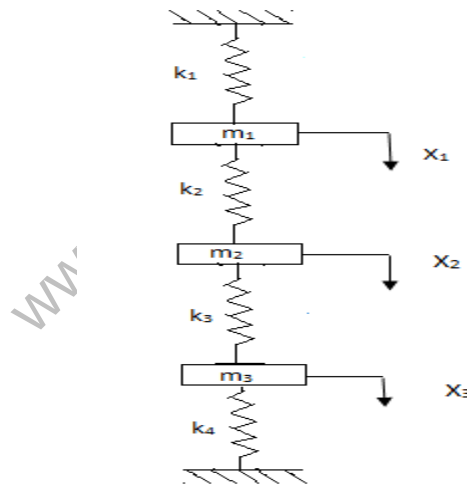


Fig.2

4. A three rotor system shown in Fig.3 has the following physical constants. $J_1 = 50 \text{ kg-cm-s}^2$, $J_2 = 100 \text{ kg-cm-s}^2$, $J_3 = 70 \text{ kg-cm-s}^2$, $k_{t1} = 2.2 \times 10^6 \text{ kg-cm/rad}$, $k_{t2} = 0.8 \times 10^6 \text{ kg-cm/rad}$. Find the natural frequencies of the system.

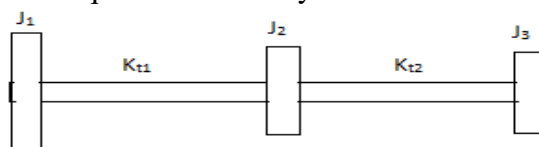


Fig.3

Subject Code: G1504/R13

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

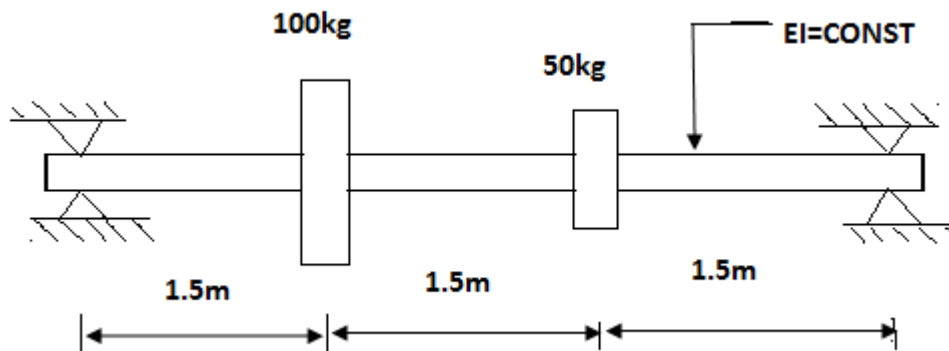


Fig.4

7. A light cantilever steel shaft 5cm dia and 40cm long has a heavy C.I. disc 30cm dia and 5cm thick at its end as shown in Fig.5. Assuming the density of cast iron as 7.2 g/cm^3 , determine the two critical speeds of the shaft.

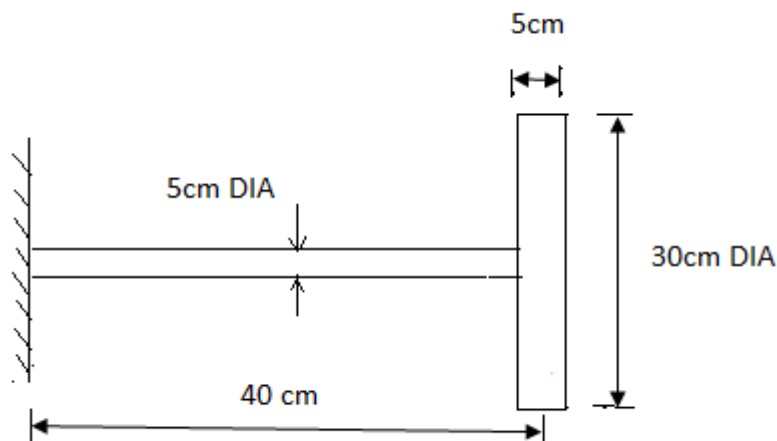


Fig.5.

8. a) What are the principles on which a Vibrometer and an accelerometer are based?
b) Discuss Seismic instrument with help of a sketch?

Subject Code: G5602/R13

M. Tech – I Semester Regular/Supplementary Examinations, April, 2015

HVDC TRANSMISSION

(Common to HVE, HVPS, PS, PSC&A, EPE, EPS, PE, P&ID, PE&ED, PE&D, EM&D, PE&PS and APS)

Time: 3 Hours

Max Marks: 60

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

1. (a) Briefly explain the power handling capabilities of HVDC lines.
(b) Mention the advantages of HVDC technical economical reliability aspects.
2. (a) Write the special features of converter transformers.
(b) Draw the equivalent circuit of converter and explain it.
3. Mention the reasons for generation of harmonics in HVDC transmission.
4. Write short notes on the following terms
(a) Individual phase control
(b) Constant extinction angle
5. (a) Explain the significance of DC power modulation.
(b) What are the advantages of Multi-terminal DC links?
6. (a) Give the comparison between series and parallel MTDC systems.
(b) Draw and explain the rectifier characteristics by voltage limiting control method.
7. (a) Discuss about the over voltages due to disturbances on DC side.
(b) What are the uses of circuit breakers in HVDC systems?
8. (a) Explain briefly about surge arrester and their application?
(b) Discuss about over current protection.

Subject Code: G6806/R13

M. Tech – I Semester Regular/Supplementary Examinations, April, 2015

DIGITAL SYSTEM DESIGN

(Common to VLSI&ES, ES&VLSI, VLSID&ES, ES&VLSID, VLSI, VLSID, VLSISD, VLSI&ME, ES, DE&CS, E&CE and DECE)

Time: 3 Hours

Max Marks: 60

Answer any FIVE questions

All questions carry EQUAL marks

1. a) Explain the procedure how to minimization of switching function using tabular method with example
b) Explain the Passport checking problem with example and draw its procedure steps
2. a) Give the procedure steps for Cube based algorithm and explain its operation with examples
b) Briefly explain the CAMP-1 algorithm procedure with examples
3. a) Explain the difference between PROM, PAL and PLA in detail
b) Draw the PLA block diagram and explain its operation with example
4. Explain the procedure steps of PLA folding algorithm and illustration of algorithm with suitable example.
5. a) Explain the procedure how to realization of State machine chart and draw its equivalent diagram
b) Explain the different Faults presented in combinational circuits with examples
6. a) Draw the architecture of Built in self test and explain its operation
b) Explain the test generation and test process in a combinational circuits
7. a) Explain the procedure how to find fault detection and location in sequential circuits
b) Give the detailed procedure of circuit test approach of sequential circuits
8. Write short notes on following terms in detail
 - a) Kohavi algorithm with example
 - b) Boolean difference method in combinational circuits
