14. a. Explain briefly about vibration problems in
    (i) Single plane balancing
    (ii) Two plane balancing

(OR)

b. Discuss field measurements on various compressors, fans and machine foundation.

15. a. Explain briefly about:
    (i) Sound absorption
    (ii) Sound isolation
    (iii) Sound muffling

(OR)

b. Discuss sound measurement analysis.

* * * *

Reg. No.										

B.Tech. DEGREE EXAMINATION, MAY 2014
Sixth Semester

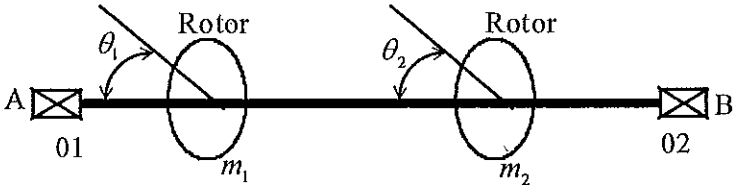
ME0301A – FUNDAMENTALS OF VIRBATION AND NOISE
(For the candidates admitted from the academic year 2007-2008 to 2012-2013)

Time: Three hours Max. Marks: 100

Answer **ALL** Questions

PART – A (10 × 2 = 20 Marks)

1. What are the causes of vibration?
2. Write down the generalized equation of motion for the spring mass damping systems.
3. What is semi definite system?
4. Write down the equations of motion for the rotor system shown in figure.



5. Define: Influence coefficient.
6. Write down the Dunkerley's equation and why it is used?
7. What are the classifications of vibration instruments?
8. What is vibrometer?
9. What are the different machine condition monitoring techniques used in vibration analysis?
10. Define Wave length of sound.

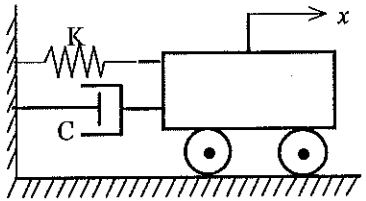
PART – B (5 × 16 = 80 Marks)

11.a.i Explain various methods used to find the natural frequency. (10 Marks)

ii. Find out the equivalent stiffness of springs in series and parallel. (6 Marks)

(OR)

b. i. Write down the displacement equation for the system shown in figure.

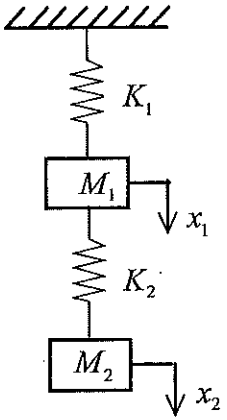


(10 Marks)

ii. Define: Degree of dampness. (2 Marks)

iii. Explain about the whirling speed of a shaft. (4 Marks)

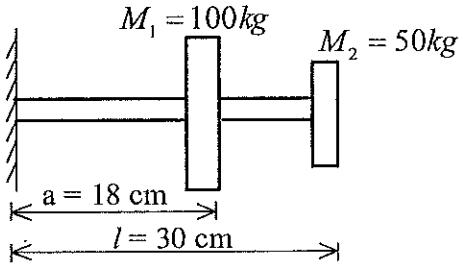
12. a. Figure shows a vibrating system having two D.O.F. Determine the two natural frequencies of vibrations and the ratio of amplitude of the motion M_1 and M_2 the two modes of vibration. Given M_1 = 1.5 kg and M_2 = 0.80 kg. $K_1 = K_2 = 40$ N/m.



(OR)

b. A machine runs at 5000 rpm. Its forcing frequency is very near to its natural frequency. If the nearest frequency at the machine is atleast 20 % from the forced frequency. Design a suitable vibration absorber for the system. Assume the mass of the machine as 30 kg.

13. a. Find the natural frequency of vibration for the system shown in figure by Rayleigh method.
$E = 1.96 \times 10^{11}$ N/m^2, $I = 4 \times 10^{-7}$ m^4.



(OR)

b. A shaft of negligible weight 6 cm diameter and 5 m long is simply supported at the ends and carries four weights 50 kg each at equal distance over the length of the shaft. Find the frequency of vibration by Dunkerley's method. Take $E = 2 \times 10^5$ N/mm^2.