Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(Marine Engg.) (2013 Batch) (Sem.–7)

MECHANICAL VIBRATIONS

Subject Code : BTME-803

Paper ID : [74247]

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

Q1 Answer briefly :

a) What is the basic concept of vibration?

b) Define natural frequency.

c) What is over damped system?

d) What do you understand by transmissibility?

e) Define transient vibration.

f) What do you understand by stiffness coefficient?

g) What is the dynamic vibration absorber?

h) Why is it important to find the natural frequency of a vibrating system?

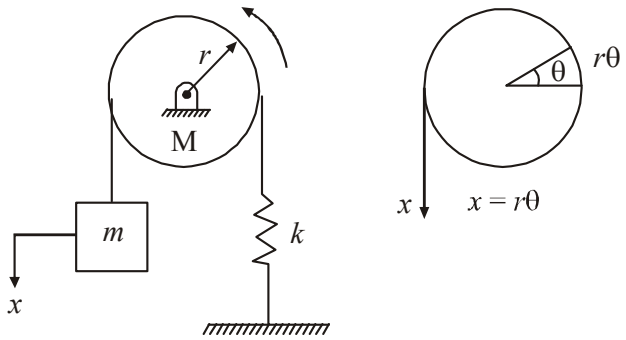
i) Define whirling speed of shafts.

j) What is Rayleigh's method? Write its applications.

SECTION-B

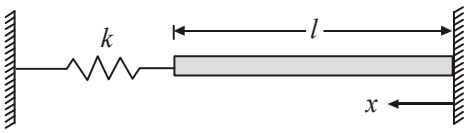
Q2 "*Continuous system has infinite degree of freedom*" do you agree with this statement. Explain your answer with help of example.

Q3 Determine the natural frequency of the spring mass pulley system shown in fig.



Free body diagram

Q4 A bar of length 1 fixed at one end and connected at the other end by a spring of stiffness k as shown in fig. Drive suitable expression of motion for longitudinal vibrations.



Q5 What is importance of vibration measurement? Explain accelerometer.

Q6 Draw a neat sketch of centrifugal pendulum absorber and explain its working.

SECTION-C

Q7 A shaft of negligible weight 6 cm diameter and 5 meter long is simply supported at the ends and carries four weight 50 kg each at equal distance over the length of the shaft. Find the frequency of vibration by Dunkerley's method. Take $E = 2 \times 10^6$ kg/cm^2

Q8 In a spring mass dashpot system k = 30 K N/m, m = 100 kg and the damping provided is only 25% of the critical value. Determine

a) The damping ratio,

b) The critical damping coefficient,

c) The natural frequency of damped vibration

d) The logarithmic decrement and

e) The ratio of two successive amplitudes.

Q9 Explain following :

a) Stodola method

b) Working of dry friction damper