MECHANICAL ENGINEERING DEPARTMENT

SUBJECT: MECHANICAL VIBRATION

SEMESTER : VI (CBSGS)

QUESTION BANK (for reference only)

1. Frequency of vibrations is usually expressed in
    a. Number of cycles per hour
    b. Number of cycles per minute
    c. Number of cycles per second
    d. Time period
2. What is the effect on undamped natural frequency of single degree of freedom system if the stiffness of the one or more is increased?
    a. The frequency will increase
    b. The frequency remains same
    c. The frequency will become zero
    d. The frequency will decrease
3. In a spring mass system, which of the following force is not considered?
    a. Spring force
    b. Damping force
    c. Accelerating force
    d. Inertia force
4. The maximum acceleration of a particle moving with simple harmonic motion is
    a. ω
    b. π / ω
    c. ωr
    d. 2ω
5. In Rayleigh's method, the _____ at the mean position is equal to the maximum potential energy at the extreme point
    a. Minimum kinetic energy
    b. Minimum potential energy
    c. Maximum kinetic energy
    d. Maximum potential energy
6. From the following, which one is also known as low frequency transducer?
    a. Stroboscope
    b. Accelerometer
    c. Vibrometer
    d. Velometer
7. A seismometer is a device which is used to measure
    a. Displacement
    b. Velocity
    c. Frequency
    d. Accelerometer
8. If the isolation factor is negative, then what is the phase difference between transmitted and disturbing force?

a. 90 degree
b. 180 degree
c. 360 degree
d. 270 degree

9. The damping factor is the measure of the relative amount of the damping in the existing system with that necessary for the _____ system
   a. Underdamped
   b. Overdamped
   c. Critical damped
   d. Any system
10. The speed at which the shaft runs so that the additional deflection of the shaft from the axis of rotation becomes _____, is known as critical or whirling speed.
   a. Zero
   b. Minimum
   c. Maximum
   d. Infinite
11. A system has mass of 60kg has a spring stiffness 294000 N/m. What will be the value of the critical damping coefficient?
   a. 16563
   b. 26563
   c. 36563
   d. 46563
12. In which case, the factor c = 0?
   a. When there is damping
   b. When there is no damping
   c. Resonance
   d. C is never zero
13. Maximum displacement due to forced vibration _____ the displacement due to static force.
   a. Inversely proportional to
   b. Direct proportional to
   c. Independent of
   d. Cannot say
14. In which of the following cases, critical damping occurs?
   a. Roots are real
   b. Roots are complex conjugate
   c. Roots are equal
   d. independent of the equation
15. two springs have spring stiffness 1500 N/m and 2000 N/m respectively. If they are connected in series, what is the spring stiffness if they are replaced by an equivalent system 3500 N/m
   a. 3500 N/m
   b. 1166 N/m
   c. 857.63 N/m
   d. 1500 N/m
16. Calculate logarithmic decrement if damping factor is 0.33

a. 1.36
b. 3.23
c. 5.16
d. 2.19

17. Secondary force in reciprocating mechanism is caused due to _____
    a. S.H.M of reciprocating parts
    b. Oscillation of reciprocating parts
    c. Obliquity of arrangement of reciprocating parts
    d. Rotation of parts
18. In vibration isolation system, if ω / ωn is less than √2, then all value of damping factor, the transmissibility will be
    a. Less than unity
    b. Greater than unity
    c. Equal to zero
    d. Infinite
19. Find the natural frequency in Hz of the free longitudinal vibrations if the displacement is 2 mm.
    a. 9.14
    b. 11.14
    c. 13.14
    d. 1.14
20. Determine the natural frequency of a system, which has equivalent spring stiffness of 30000 N/m and masses of 20 kg?
    a. 12.32 Hz
    b. 4.16 Hz
    c. 6.16 Hz
    d. 5.16 Hz
    e. frequency should be large
    f. Its natural frequency should be small
    g. Its natural frequency should be infinite
    h. Its natural frequency should be zero
21. Magnification factor is the ratio of _____
    a. Zero frequency deflection and amplitude of steady state vibration
    b. Amplitude of steady state vibrations and zero frequency deflection
    c. Amplitude of unsteady state vibrations and zero frequency deflection
    d. Zero frequency deflection and amplitude of unsteady state vibration
22. Which formula is used to calculate mass moment of inertia of a circular rim about the axis through a center of gravity?
    a. $2mr^2$
    b. mr^3
    c. $mr^2/2$
    d. mr^2
23. The ratio of maximum displacement of the forced vibration to the deflection due to the static force, is known as
    a. Damping factor
    b. Damping coefficient

c. Logarithmic decrement
d. Magnification factor