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| Q 1. **Calculate equivalent stiffness of the spring for the system shown below,**  **which has spring stiffness of 3000 N/m**  http://www.careerride.com/testimagehandler.ashx?id=9969 | |
| a)1000 N/m | b) 2250 N/m |
| c) 2000 N/m | d) None of the above |
| Correct answer: b) 2250 N/m | |
| Q 2. **Two springs have spring stiffness of 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) None of the above |
| Correct answer: c) 857.63 N/m | |
| Q 3. **Which type of vibrations are also known as transient vibrations?** | |
| a) Undamped vibrations | b) Damped vibrations |
| c) Torsional vibrations | d) Transverse vibrations |
| Correct answer: b) Damped vibrations | |
| Q 4. **During transverse vibrations, shaft is subjected to which type of stresses?** | |
| a) Tensile stresses | b) Torsional shear stress |
| c) Bending stresses | d) All of the above |
| Correct answer: c) Bending stresses | |
| Q 5. **Which of the following relations is true when springs are connected**  **parallelly? where K = spring stiffnes** | |
| a) Ke = K1 + K2 | b) (1 / Ke) = (1/K1) + (1/ K2) |
| c) Ke = (1/K1) + (1/ K2) | d) None of the above |
| Correct answer: a) Ke = K1 + K2 | |
| Q 6. **What are deterministic vibrations?** | |
| 1. Vibrations caused due to known exciting force | 1. Vibrations caused due to unknown   exciting force |
| c) Vibrations which are aperiodic in nature | d) None of the above |
| Correct answer: a) Vibrations caused due to known exciting force | |
| Q 7.**Which of the following vibrations are classified according to magnitude of**  **actuating force?** | |
| a) Torsional vibrations | b) Deterministic vibrations |
| c) Transverse vibrations | d) All of the above |
| Correct answer: b) Deterministic vibrations | |
| Q 8. **In which type of vibrations, amplitude of vibration goes on decreasing every**  **cycle?** | |
| a) Damped vibrations | b) Undamped vibrations |
| c) Both a. and b | d) None of the above |
| Correct answer: a) Damped vibrations | |
| Q 9. **What are discrete parameter systems?** | |
| 1. Systems which have infinite number of degree of freedom | 1. Systems which have finite number of degree of freedom |
| 1. Systems which have no degree of   freedom | d) None of the above |
| Correct answer: b) Systems which have finite number of degree of freedom | |
| Q 10. **Which among the following is the fundamental equation of S.H.M.?** | |
| a) x + (k / m) x =0 | b) x + ω2x =0 |
| c) x + (k/ m)2 x =0 | d) x2 + ωx2 =0 |
| Correct answer: b) x + ω2x =0 | |
| Q 11. **Determine logarithmic decrement, if the amplitude of a vibrating body**  **reduces to 1/6th in two cycles.** | |
| a) 0.223 | b) 0.8958 |
| c) 0.3890 | d) None of the above |
| Correct answer: b) 0.8958 | |
| Q 12. **Calculate coefficient of viscous damper, if the system is critically damped.   Consider the following data: 1. Mass of spring mass damper system = 350 kg**  **2. Static deflection = 2 x 10–3 m, 3. Natural frequency of the system = 60 rad/sec** | |
| a) 100.5 x 103 N-s/m | b) 80 x 103 N-s/m |
| c) 42 x 103 N-s/m | d) None of the above |
| Correct answer: c) 42 x 103 N-s/m | |
| Q 13. **Calculate logarithmic decrement if damping factor is 0.33.** | |
| a) 1.36 | b) 3.23 |
| c) 5.16 | d) 2.19 |
| Correct answer: d) 2.19 | |
| Q 14. **Calculate natural frequency of damped vibration, if damping factor is 0.52**  **and natural frequency of the system is 30 rad/sec which consists of machine**  **supported on springs and dashpots.** | |
| a) 25.62 rad/sec | b) 20.78 rad/sec |
| c) 14.4 rad/sec | d) 15.33 rad/sec |
| Correct answer: a) 25.62 rad/sec | |
| Q 15. **In damped free vibrations, which parameters indicate vibrations?** | |
| a) Natural frequency | b) Rate of decay of amplitude |
| c) Both a. and b | d) None of the above |
| Correct answer: c) Both a. and b | |
| Q 16. **According to D' Alembert's principle, m (d2x/ dt2) + c (dx/dt) + Kx =0 is the**  **differential equation for damped free vibrations having single degree of**  **freedom. What will be the solution to this differential equation if the system**  **is critically damped?** | |
| a) x = (A + Bt) e– ωt | b) x = X e– ξωt (sin ωdt + Φ) |
| c) x = (A – Bt) e– ωt | d) x = X e– ξωt (cos ωdt + Φ) |
| Correct answer: a) x = (A + Bt) e– ωt | |
| Q 17. **Which of the following statements is/are true for coulomb damping?**   1. **Coulomb damping occurs due to friction between two lubricated surfaces** 2. **Damping force is opposite to the direction of motion of vibrating body** 3. **For smooth surfaces, coefficient of friction depends upon velocity** 4. **Damping force depends upon the rubbing velocity between two rubbing surfaces** | |
| a) Only statement **A** | b) Statement **B, C** and statement **D** |
| c) Only statement **B** | d) All the above statements are true |
| Correct answer: c) Only statement **B** | |
| Q 18. **What is meant by critical damping coefficient?** | |
| 1. Frequency of damped free vibrations is less than zero | b) The motion is aperiodic in nature |
| c) Both a. and b. | d) None of the above |
| Correct answer: b) The motion is aperiodic in nature | |
| Q 19. **Which of the following relations is true for viscous damping?** | |
| a) Force α relative displacement | b) Force α relative velocity |
| c) Force α (1 / relative velocity) | d) None of the above |
| Correct answer: b) Force α relative velocity | |
| Q 20. **Eddy current damping is an example of \_\_\_\_\_** | |
| a) Coulomb damping | b) Hysteresis damping |
| c) Viscous damping | d) Dry friction damping |
| Correct answer: c) Viscous damping | |
| Q 21. **Which of the following statements is/are true for elastomers?** | |
| 1. Elastomers can be used for static   deflections up to 12 mm | 1. Elastomers can provide natural   frequencies below 5 Hz |
| 1. Elastomers have good performance at high frequencies | d) All the above statements are true |
| Correct answer: d) All the above statements are true | |
| Q 22. **Which of the following statements is/are false for pneumatic isolators? 1. Pneumatic isolators are used when driving frequencies below 10 Hz are**  **present 2. Nausea is caused due to noise at low frequencies  3. At high natural frequencies, isolators can obtain efficiency of 90% 4. Pneumatic isolators have limited load carrying capacity** | |
| a) Only statement 1 | b) Only statement 3 |
| c) Only statement 2, 4 | d) All the above statements are false |
| Correct answer: b) Only statement 3 | |
| Q 23. **A vibrating machine of 100 kg is mounted on a rubber pad which has stiffness**  **of 500 N/m. Determine force transmitted to the foundation if the unbalanced**  **force 500 N acts on it. The frequency ratio (ω/ωn) is 1.5 and ξ = 0.5.** | |
| a) 461.62 N | b) 400.23 N |
| c) 450 N | d) Insufficient data |
| Correct answer: a) 461.62 N | |
| Q 24. **Transmissibility is the ratio of \_\_\_\_\_\_** | |
| 1. force transmitted to the supporting   structure and force impressed upon the system | 1. displacement amplitude of mass and   displacement amplitude of supporting structure |
| c) both a. and b | d) none of the above |
| Correct answer: c) both a. and b | |
| Q 25. **What is the function of the controller in active vibration isolation systems?** | |
| a) Detect vibrations to be controlled | b) Reposition the masses |
| 1. Interpret detected vibrations and execute commands | d) All of the above |
| Correct answer: c) Interpret detected vibrations and execute commands | |
| Q 26. **Which among the following is not considered when reference standards are**  **used in the field of mechanical vibration and shock, monitoring and analysis**  **of machines?** | |
| a) Terminology | b) Methods of testing |
| c) Methods of measurement | d) None of the above |
| Correct answer: d) None of the above | |
| Q 27. **Which basic document describes general requirements for measurement and**  **evaluation of machine vibrations using shaft measurements?** | |
| a) ISO – 10816-1 | b) ISO – 7919-1 |
| c) Both a. and b | d) None of the above |
| Correct answer: b) ISO – 7919-1 | |
| Q 28. **In the graph shown below, the region in which frequency ratio (ω/ωn) > √2 is**  **known as\_\_\_\_**  http://www.careerride.com/testimagehandler.ashx?id=9923 | |
| a) Amplification region | b) Isolation region |
| c) Spring controlled region | d) None of the above |
| Correct answer: b) Isolation region | |
| Q 29. **Which of the following is a type of untuned vibration absorber?** | |
| a) Houdaille damper | b) Torsional vibration absorber |
| c) Centrifugal pendulum absorber | d) All of the above |
| Correct answer: a) Houdaille damper | |
| Q 30. **Which of the following methods can be used to reduce excitation level at the**  **source?** | |
| a) Lubrication of joints | b) Balancing inertia forces |
| c) Both a. and b | d) None of the above |
| Correct answer: c) Both a. and b | |
| **Q31 -33 related to above diagram**  **Q31. The wavelength of the wave is:** | |
| a) 0.5 m | b) 1.0 m |
| c) 2.0 m | d) 4.0 m |
| Correct answer: c) 2.0 m | |
| Q 32. **The amplitude of the wave is:** | |
| a) 0.5 m | b) 1.0 m |
| c) 2.0 m | d) 4.0 m |
| Correct answer: b) 1.0 m | |
| Q 33. **The frequency of the wave is:** | |
| a) 2 Hz | b) 3 Hz |
| c) 1.5 Hz | d) 0.5 Hz |
| Correct answer: a) 2 Hz | |
| Q 34. **A girl on the beach watching water waves sees 4 waves pass by in 2**  **seconds, each with a wavelength of 0.5 m. The speed of the waves is:** | |
| a) 0.25 m/s | b) 0.5 m/s |
| c) 1.0 m/s | d) 2.0 m/s |
| Correct answer: c) 1.0 m/s | |
| Q 35. **As a wave passes from a spring to another spring with a greater tension:** | |
| (a) Speed of the wave decreases | (b) Frequency of the wave increases. |
| (c) Frequency of the wave decreases. | (d) Amplitude of the wave increases. |
| Correct answer: c) Frequency of the wave decreases | |
| Q 36. **A wave source of constant frequency sends a wave through a tight string**  **of uniform density with a speed and wavelength The tension is then**  **relaxed to half its initial tension. Speed of the wave is now:** | |
| a) | b) |
| c) | d) |
| Correct answer: c) | |
| Q 37. **The Doppler effect produces apparent changes in:** | |
| a) Loudness | b) Frequency |
| c) Amplitude | d) Velocity |
| Correct answer: b) Frequency | |
| Q 38. **Vibration of an object about an equilibrium point is called simple harmonic**  **motion when the restoring force is proportional to** | |
| a) Time | b) Displacement |
| c) Spring Constant | d) Mass |
| Correct answer: b) Displacement | |
| Q 39. **For a mass hanging from a spring, the maximum displacement the spring**  **is stretched or compressed from its equilibrium position is the system’s:** | |
| a) Amplitude | b) Time Period |
| c) Frequency | d) Acceleration. |
| Correct answer: a) Amplitude | |
| Q 40. **A piano wire has a tension of 650 N and a mass per unit length of 0.060**  **g/cm. What is the speed of waves on this wire?** | |
| a) 1.0 × 102 m/s | b) 3.3 × 102 m/s |
| c) 1.0 × 102 m/s | d) 33 m/s |
| Correct answer: b) 3.3 × 102 m/s | |
| Q 41. **In a sinusoidal traveling wave, the distance between two points that**  **differ in phase by 2π radians is the:** | |
| a) Frequency | b) Period |
| c) Amplitude | d) Phase constant |
| Correct answer: c) Amplitude | |
| Q 42. **Sound is a good example of:** | |
| a) Transverse waves | b) Longitudinal waves |
| c) Both transverse and Longitudinal  waves | d) None of the above |
| Correct answer: b) Longitudinal waves | |
| Q 43. **A pendulum bob is a good example of:** | |
| a) Vibration | b) Oscillation |
| c) Ventilation | d) Periodic Motion |
| Correct answer: d) Periodic Motion | |
| Q 44. **Direction of waves is parallel to distance of vibration in:** | |
| a) Transverse waves | b) Longitudinal waves |
| c) Both transverse and Longitudinal waves | d) None of the above |
| Correct answer: b) Longitudinal waves | |
| Q 45**. A wave source of constant frequency sends a wave through a tight string**  **of uniform density with a speed and wavelength The tension is then**  **relaxed to half its initial tension. The wavelength of the wave is now:** | |
| a) | b) |
| c) | d) |
| Correct answer: c) | |
| Q 46. **Velocity at equilibrium position is** | |
| a) constant | b) minimum |
| c) maximum | d) zero |
| Correct answer: c) maximum | |
| Q 47. **If swing moves from right to left then velocity is** | |
| a) negative | b) positive |
| c) constant | d) zero |
| Correct answer: a) negative | |
| Q 48. **Acceleration is directly related to** | |
| a) displacement | b) negative of displacement |
| c) velocity | d) negative of speed |
| Correct answer: b) negative of displacement | |
| Q 49. **Gradient of velocity-time graph gives** | |
| a) force | b) frequency |
| c) wavelength | d) acceleration |
| Correct answer: d) acceleration | |
| Q 50. **Magnitude of gradient of a-x graph is** | |
| a) ω | b) ω2 |
| c) ω/2 | d) ω3 |
| Correct answer: b) ω2 | |
| Q 51. **Potential energy of system is maximum at** | |
| a) extreme position | b) mean position |
| c) in between extreme and mean position | d) moderate position |
| Correct answer: a) extreme position | |
| Q 52. **In S.H.M acceleration is always directed towards the** | |
| a) equilibrium position | b) mean position |
| c) tangent to motion | d) downwards |
| Correct answer: b) mean position | |
| Q 53. **Number of oscillations per unit time is** | |
| a) amplitude | b) wavelength |
| c) frequency | d) period |
| Correct answer: c) frequency | |
| Q 54. **When displacement x = 0 then kinetic energy of system is** | |
| a) minimum | b) maximum |
| c) constant | d) zero |
| Correct answer: d) zero |  |
| Q 55**. Energy of a system executing S.H.M is** | |
| a) increasing | b) decreasing |
| c) constant | d) variable |
| Correct answer: c) constant | |
| Q 56. **Oscillatory motion has a** | |
| a) straight lined graph | b) randomly lined graph |
| c) sinusoidal graph | d) asymptotic graph |
| Correct answer: c) sinusoidal graph | |
| **Q 57. If an object moves back and forth repeatedly around a mean position it is**  **called** | |
| a) oscillating | b) revolving |
| c) rotating | d) under linear motion |
| Correct answer: a) oscillating | |
| Q 58. **Our eyes detect oscillations up to** | |
| a) 8 Hz | b) 9 Hz |
| c) 6 Hz | d) 5 Hz |
| Correct answer: d) 5 Hz | |
| Q 59. **The force that acts to return mass to its equilibrium position is called** | |
| a) frictional force | b) restoring force |
| c) normal force | d) contact force |
| Correct answer: b) restoring force | |
| Q 60**. In cars springs are damped by** | |
| a) shock absorbers | b) engine |
| c) brake pedals | d) tyres |
| Correct answer: a) shock absorbers | |