Question FBQ1 :

|  |
| --- |
| When the motion of particles of the medium is perpendicular to the direction in which the wave propagates, it is called a \_\_\_\_ wave. |

Answer: Transverse  
  
Question FBQ2 : Two identical inductively coupled circuits, each having a natural frequency of 600 Hz, have coupling coefficient 0.44. Calculate the two normal mode frequencies.  
Answer: 500 Hz and 802 Hz  
  
Question FBQ3 : When a wave travels through a medium, the resistance to wave motion in a medium is called \_\_\_\_.  
Answer: Impedance  
  
Question FBQ4 : In a\_\_\_\_\_ , the magnitude of restoring force is linearly proportional to the displacement  
Answer: spring-mass system  
  
Question FBQ5 : What is the phase angle of this equation xt=Acosw0t+φ?  
Answer: w0t+φ    
  
Question FBQ6 : The restoring force is always directed towards the\_\_\_\_\_\_of an oscillating body.  
Answer: equilibrium position  
  
Question FBQ7 : \_\_\_\_\_ is a type of periodic motion where the restoring force is proportional to the displacement.  
Answer: Harmonic vibration  
  
Question FBQ8 : In the case of simple harmonic motion (SHM), if the particle is at the mean position, then the particle is in\_\_\_\_.  
Answer: Stable equilibrium  
  
Question FBQ9 : The quantity k/m of the differential equation of a spring-mass system (md2xdt2= -kx) has a dimension of \_\_\_\_\_\_\_\_\_\_\_.  
Answer: T-2  
  
Question FBQ10 : The quantity k/m of the differential equation of a spring-mass system  has a dimension of \_\_\_\_\_\_\_\_\_\_\_.  
The *k/m*in the above equation is replaced by ω02 *angular frequency*of the oscillatory motion, because  
Answer: they have same unit  
  
Question FBQ11 : When a system is said to be heavily damped, the motion of the system is said to be \_\_\_\_\_\_  
Answer: Dead beat  
  
Question FBQ12 : When b<wo, we refer to it as a case of \_\_\_\_ damping.  
Answer: Weak  
  
Question FBQ13 : xt=mcos(w0t+φ), the amplitude of this equation is \_\_\_\_\_\_\_\_\_.  
Answer: m  
  
Question FBQ14 : Amplitude is defined as \_\_\_\_\_\_\_.  
Answer: Maximum displacement of an oscillating body  
  
Question FBQ15 : Calculate the characteristic impedance offered by a thin wire of steel stretched by a force of 80 N weighing 2g per metre.  
Answer: 0.4 N/ms  
  
Question FBQ16 : Calculate the characteristic impedance offered by a thin wire of steel stretched by a force of 80 N weighing 2g per metre.  
Answer: 0.4 N/ms  
  
Question FBQ17 : What sound does our vocal cord create inside the throat when we talk?  
Answer: Vibration  
  
Question FBQ18 : When a progressive wave reaches the boundary of a finite medium or an interface between two media, waves undergo\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_or/and \_\_\_\_\_.  
Answer: Reflection refraction  
  
Question FBQ19 : \_\_\_\_\_\_ is the minimum displacement of wave.  
Answer: Trough  
  
Question FBQ20 : The locus of points in the same phase at a particular time is called \_\_\_.  
Answer: wavefront  
  
Question FBQ21 : Waves set up by a single, isolated disturbance are called \_\_\_\_  
Answer: Pulses  
  
Question FBQ22 : The simplest type of a periodic wave is a \_\_\_\_wave.  
Answer: harmonic  
  
Question FBQ23 : \_\_\_\_\_ are waves that occur at the boundary  
Answer: Rayleigh waves  
  
Question FBQ24 : The displacement of a particle executing simple harmonic motion is given by, x= 0.25cos(4πt+0.078) in metre. The amplitude is\_\_\_\_\_\_\_.  
Answer: 0.25  
  
Question FBQ25 :   
Answer: - πsin4πt+0.078  
  
Question FBQ26 : The \_\_\_\_ waves govern the working of a radar for detection of aircrafts.  
Answer: Reflection of electromagnetic waves  
  
Question FBQ27 : When a wave moves from a lighter to a denser medium, its velocity \_\_\_\_  
Answer: Decreases  
  
Question FBQ28 : The \_\_\_\_\_ conditions are the conditions which must be satisfied at the interface where the two media meet  
Answer: Boundary  
  
Question FBQ29 : When Z2>Z1, the second string (medium) is denser, R12 is still \_\_\_, implying a phase change of π on reflection.  
Answer: Negative  
  
Question FBQ30 : When resistance to motion is very strong, the system is said to be \_\_\_ damped.  
Answer: heavily  
  
Question FBQ31 : If the source of a wave is so far from away from an aperture that the wavefront generating the diffraction pattern is regarded as plane wavefront, we have \_\_\_\_\_ diffraction  
Answer: Fraunhofer  
  
Question FBQ32 : The waves produced by a motor boat sailing in water are\_\_\_.  
Answer: Transverse waves  
  
Question FBQ33 : \_\_\_\_\_\_\_\_is the superposition of many waves of same amplitude and frequency, but differing slightly in phase.  
Answer: Diffraction  
  
Question FBQ34 : The statement that every point on an advancing wave front is a source of secondary wavelet is \_\_\_\_\_ principle.  
Answer: Huygen's  
  
Question FBQ35 : The intensity of a wave is the measure of its \_\_\_across a unit area perpendicular to the direction of motion.  
Answer: power  
  
Question MCQ1 : Which of the following is/are an example of a mechanical wave (I) Sound wave (II) Water waves (III) Light waves  
Answer: I and II only  
  
Question MCQ2 : Which of the following is not a property of a longitudinal wave?  
Answer: Polarisation  
  
Question MCQ3 : The frequency of wave is 0.002 Hz. Its time period is \_\_\_\_\_\_\_\_.  
Answer: 500s  
  
Question MCQ4 : A pendulum suspended from the roof of a train has a period T (When the train is at rest). When the train is accelerating with a uniform acceleration ‘a’, the time period of the pendulum will \_\_\_\_\_\_\_\_.  
Answer: Decrease  
  
Question MCQ5 : In simple harmonic motion, velocity at equilibrium position is \_\_\_\_\_\_\_\_.  
Answer: Maximum  
  
Question MCQ6 : Over-damping results to \_\_\_\_\_\_\_\_.  
Answer: slower return to equilibrium  
  
Question MCQ7 : In simple harmonic motion (SHM), the particle is:  
Answer: Alternately accelerated and retarded  
  
Question MCQ8 : A damped system is characterised by all of the following except \_\_\_\_\_\_\_\_.  
Answer: critical damping  
  
Question MCQ9 : The total energy of a particle executing SHM is proportional to \_\_\_\_\_\_\_\_.  
Answer: square of amplitude of motion  
  
Question MCQ10 : Which of the following options is incorrect of damping motion?  
Answer: Enthalpy change  
  
Question MCQ11 : Which of the following represent stokes law?  
Answer: 6πηrv  
  
Question MCQ12 : In the equation Fd= -ɣv, the negative sign indicates that \_\_\_\_\_\_.  
Answer: the damping force opposes motion  
  
Question MCQ13 : A vibration of a pendulum in a viscous medium such as thick oil is an example of \_\_\_\_\_\_\_\_.  
Answer: Heavily damped system  
  
Question MCQ14 : For a simple harmonic oscillator, the number of vibrations executed per second is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
Answer: Frequency  
  
Question MCQ15 : The intensity of a wave is the measure of its \_\_\_\_\_\_\_\_.  
Answer: power across a unit area perpendicular to the direction of motion  
  
Question MCQ16 : A student tunes a guitar by comparing the sound of the string with that of a standard tuning fork. He notices a beat frequency of 5 Hz when both sounds are superposed. He tightens the guitar string and finds the beat frequency rises to 8 Hz. What should he do to match the frequency of the string to that of the tuning fork?  
Answer: He must loosen the guitar string  
  
Question MCQ17 : A note of frequency 1200 vibrations/s has an intensity of 2.0µW/m2. What is the amplitude of the air vibrations caused by this sound?  
Answer: 1.28×10-4 m  
  
Question MCQ18 : When the motion of particles of the medium is along the direction in which wave propagates, it is called a \_\_\_\_.  
Answer: Longitudinal wave  
  
Question MCQ19 : Oscillations become damped due to \_\_\_\_\_\_\_\_.  
Answer: Frictional force  
  
Question MCQ20 : The time period of a pendulum on Earth is 1.0 s. What would be the period of a pendulum of the same length on a planet with half the density but twice the radius of Earth?  
Answer: 1.0s  
  
Question MCQ21 : Two sound waves have intensities 0.4 and 10W/m2, respectively. How many decibels is one louder than the other?  
Answer: 14 Db  
  
Question MCQ22 : A simple pendulum has a period of 2 s and an amplitude of 50. After 20 complete oscillations, its amplitude is reduced to 40. Find the damping constant and the time constant.  
Answer: 179.5s-1  
  
Question MCQ23 : The quality factor of a sonometer wire is 4,000. The wire vibrates at a frequency of 300 Hz. Find the time in which the amplitude decreases to half of its original value.  
Answer: 2.94s  
  
Question MCQ24 : What is the ratio of the wavelength to the period of a wave?  
Answer: velocity  
  
Question MCQ25 : A box of mass 0.2 kg is attached to one end of a spring whose other end is fixed to a rigid support. When a mass of 0.8 kg is placed inside the box, the system performs 4 oscillations per second and the amplitude falls from 2 cm to 1 cm in 30 sec. Calculate the relaxation time.  
Answer: 43.5s  
  
Question MCQ26 : A box of mass 0.2 kg is attached to one end of a spring whose other end is fixed to a rigid support. When a mass of 0.8 kg is placed inside the box, the system performs 4 oscillations per second and the amplitude falls from 2 cm to 1 cm in 30 sec. Calculate the quality factor.  
Answer: 250  
  
Question MCQ27 : The quality factor of a tuning fork of frequency 512Hz is 610^4. Calculate the time in which its energy is reduced to e-1 of its energy in the absence of damping.  
Answer: 18.7s  
  
Question MCQ28 : The quality factor of a tuning fork of frequency 512Hz is 610^4. How many oscillations will the tuning fork make in this time?  
Answer: 95.7102  
  
Question MCQ29 : As amplitude of resonant vibrations decreases, degree of damping \_\_\_\_\_\_.  
Answer: Decreases  
  
Question MCQ30 : An electric bell has a frequency 100Hz. If its time constant is 2s, determine the Q factor for the bell.  
Answer: 1256  
  
Question MCQ31 : The dot or scalar product of a force and a displacement vectors defines\_\_\_\_\_\_.  
Answer: Work  
  
Question MCQ32 : In cars, springs are damped by \_\_\_\_\_\_.  
Answer: Shock absorbers  
  
Question MCQ33 : The distance between successive particles vibrating in phase is known as \_\_\_\_.  
Answer: Wavelength  
  
Question MCQ34 : At a distance of 1m from a bursting cracker, the intensity of sound is 8.5 x 10^-5 Wm^-2 and the threshold of human hearing is about 10^-12 Wm. If sound waves spread out evenly in all directions, how far from the source could such a sound be heard?  
Answer: 9 km  
  
Question MCQ35 : A 1 m long string having mass 1 g is sketched with a force of 10 N. Calculate the speed of transverse waves.  
Answer: 5000 m/s