**Chapter 11**

**Work and Energy**

1. In which of the two incident given below work is being done and why?
2. A boy is sitting and reading a book.
3. A bullock is pulling a cart.
4. What is the work done by the earth in moving around the sun?
5. There are 2 brothers who do the same work. One brother takes 2 hours to complete the work while other takes 5 hours to do the same work. Who has more power and why?
6. State the law of conservation of energy.
7. What is work done by weight lifter when he holds the weight of 200kg on his shoulder for 2 minutes and why?
8. When is the work said to be done against the force of gravity?
9. Define the following terms
10. Power
11. Potential Energy
12. One kilowatt hour
13. Kinetic Energy
14. A mass of 20kg is at a point A on a table, it is moved to point B. If the line joining A and B is horizontal. What is the work done on object by gravitational force? Explain the answer.
15. Ravi says that acceleration in an object could be zero even when several forces are acting on it. Do you agree with him? Give reason for your answer
16. Give reason for the following
17. Energy of an object is increases when raised through a height.
18. A man does zero work when he walks on horizontal smooth road carrying a bucket of water.
19. Kinetic energy is always positive
20. When a truck moves on a road, work done by force of friction is negative.
21. An archer stretches his bow before releasing the arrow.
22. Water stored in a dam has potential energy.
23. What do you understand by positive work? Give an example to support your answer.
24. What are 3 essential conditions for work done by force acting on an object?
25. What is work done by a man for carrying a suitcase weighing 10 kg over his head, when he travels a distance of 30m in a) vertically upward b) vertically downward direction?
26. With help of an example each, write an expression for work done in following cases
27. When displacement is in direction of force
28. When displacement is in the opposite direction of the force.
29. A cricket ball of mass .15 Kg is moving with speed of 40m/s. What is its kinetic energy?
30. Define potential energy of an object. Give an expression for gravitational potential energy.
31. The potential energy of free falling object decreases progressively. Does this violate the law of conservation of energy, why?
32. An object of mass of 50 kg is raised to a height of 6m above the ground. What is its potential energy. If the object is allowed to fall, find its kinetic energy when it is half way down.
33. Find the work which must be done to increase the velocity of an object of mass 10 kg from 4m/s to 6m/s.
34. A car is moving on a levelled road and gets velocity doubled. In this process
35. How would the potential energy of the car change?
36. How would the kinetic energy of the car change?
37. How will its momentum change?

Give reasons for your answer.

1. An electric bulb is rated 10 W. What does this mean? What is the energy consumed in joules if it is used for 5 minutes?
2. Water is falling on the blades of a turbine at the rate of 6X 103 Kg per minute. The height of the fall is 10m. Calculate the power given to the turbine. (g=10m/s)
3. Why a driver speeds up his vehicle when he moves up hill?
4. Define the commercial unit of energy. Derive relationship between this unit of energy and SI unit of energy. An electrical device of 500 W is used daily in household for 9 hours. Calculate the energy consumed in the month of April.
5. Show that for a freely falling object the sum of its potential energy and Kinetic energy remains unchanged at all points during fall.
6. Define the work done by constant force. Write its SI unit and define the unit.
7. A 3000 kg truck moving at speed of 72km/hr stops after covering some distance. The force applied by brakes is 24000N. Compute the distance covered and work done by this force.
8. Multiple choice questions
9. If the body starts from rest, then change in the in its kinetic energy is
10. Positive b) Negative c) Zero d) may be positive or negative depending on mass of the body
11. The SI unit of work is
12. Joule b) watt c) Kilowatt d) Newton
13. The kinetic energy of an object is
14. ½ mv2 b) mgh c) W/ t d) none
15. Which of them does not possess kinetic energy?
16. A speeding vehicle b) a rolling stone c) water stored in a dam d) flowing water
17. For free falling object there is continual transformation of
18. Gravitational potential energy to kinetic energy b) kinetic energy to potential energy c) Kinetic to gravitational energy d) none of the above

**Chapter 12**

**Sound**

**( Deleted topics for the year 2020-2021 is Nature of sound and its propagation in various media, speed of sound, range of hearing in humans, ultrasound, reflection of sound, echo and sonar, Structure of human ear( auditory aspect only)**

1. On what factors the loudness of sound depends?
2. What is reverberation of sound?
3. In which direction medium particles oscillate in a longitudinal wave?
4. Give a relation correlating sound velocity with its frequency and wavelength.
5. What is an echo? What is minimum time interval for hearing a distinct echo?
6. Why are the walls and roof an auditorium covered with sound absorbent material?
7. What is SONAR and what is it used for?
8. What are different techniques used to produce sound?
9. When the wire of sitar is plucked, what types of waves are produced in a) air b) wire? Give reasons in support of your answer.
10. Draw a diagram depicting low pitched sound depicting low-pitched and high –pitched sound. What is the main difference between the two?
11. Ram was watching live telecast of a cricket match on his TV screen. He saw a player hitting a boundary. He observed that he could see the ball racing towards the boundary first and then heard the sound produced by ball striking the bat a bit later, why?
12. A person clapped his hands near the cliff and heard the echo after3 sec. If the speed of sound be 350m/s then find the distance of the cliff from the person.
13. State 4 arrangements that should be made in an auditorium to control excessive reverberation.
14. Explain with help of diagrams why are the ceilings of concert halls and conference halls made curved?
15. A nail was gently touched by hammer and then was hit harder
16. When will be the sound created louder?
17. Which characteristic of sound here is responsible for change in sound?
18. Explain how bat is able to fly freely in dark.
19. Differentiate between longitudinal and transverse waves
20. A stone dropped from a sky scrapper that was78.4m high splashes into the water of a pool near the base of the building. When is the sound of splash heard at the top? (Speed of sound in air is 344m/s and g=9.8m/s.
21. Give reasons for the following
22. The ceilings of the concert hall are curved.
23. Some animals make strange movements or get disturbed before the earthquake.
24. The sound of thunder is heard a little later than the flash of light is seen.
25. Echo cannot be heard everywhere.
26. A hospital uses an ultrasonic scanner to locate tumours in tissue. What is the wavelength of ultrasound in tissue in which speed of ultrasound is 1.5km/s. The operating frequency of scanner is 4.0MHz.
27. 24 vibrations are produced in a slinky in 8seconds when jerk is given to it. Find its time –period and frequency. How can a longitudinal wave be produced in the slinky?
28. a) What type of waves is produced before actual earthquake?
29. Name two species of animals which can detect and produce these kinds of waves.
30. Draw a labelled diagram of structure of ear.
31. The sound of an explosion on the surface of lake is heard by a man 100m away and a diver 100m below the point of explosion.
32. Explain who will hear the sound of explosion first.
33. If sound takes t sec to reach the man how much time will it take to reach the diver? (speed of sound in air-344m/s and in water 1533m/s)
34. Multiple choice questions
35. A sound of single frequency is known as
36. Echo b) tune c) reflection d) pitch
37. A distinct echo can be heard distinctly only when distance of reflector surface is
38. At least 17.2m b) 15m c) 7m d) 12m
39. Sound waves below the audible range are known as
40. Ultrasonic b) Infrasonic c) Supersonic d) none
41. Megaphones, horns, stethoscope make use of \_\_\_\_\_\_\_\_\_\_\_\_ of sound
42. Multiple reflection b) reflection c) echo d)reverbration