

1. Force, Work, Energy and Simple Machines

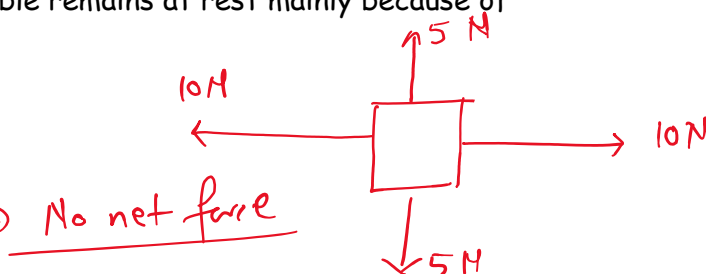
Instructions: Choose the correct option for each question.

1. Which force acts even when two objects are not touching?

- A) Friction
- B) Muscular force
- C) Gravitational force
- D) Applied force

2. A book placed on a table remains at rest mainly because of

- A) Friction
- B) Gravity
- C) Balanced forces
- D) Magnetism



3. Which statement best defines force?

- A) A form of energy
- B) A push or pull that can change motion
- C) A type of machine
- D) A measure of heat

4. Which of the following is an example of friction reducing motion?

- A) Writing with pencil
- B) Sliding a box on a floor
- C) Walking on a road
- D) Braking a bicycle ✓

5. Work is said to be done only when

- A) Force is applied
- B) Object moves in the direction of force
- C) Energy is stored
- D) Object is heavy

6. A child tries to move a wall but it does not move. In science, this means

- A) Work is done
- B) No work is done ✓
- C) Energy becomes light
- D) Gravity disappears

7. Which of these has kinetic energy?

- A) A sleeping cat
- B) A ball on a shelf
- C) A moving bus ✓
- D) A stretched bow

8. Which of these has maximum potential energy among similar objects?
- A) Object on the ground
 - B) Object on a low table
 - C) Object on a high shelf
 - D) Object moving down a slope
9. Chemical energy is stored in
- A) A running car
 - B) Food
 - C) A moving fan
 - D) Sunlight
10. Which form of energy changes into heat when two hands are rubbed together?
- A) Light energy
 - B) Magnetic energy
 - C) Mechanical energy
 - D) Nuclear energy
11. A ramp is an example of a
- A) Lever
 - B) Inclined plane
 - C) Pulley
 - D) Wedge
12. Which simple machine is used to lift a bucket from a well?
- A) Wedge
 - B) Pulley

C) Screw

D) Lever

13. An axe works as a

A) Lever

B) Wedge

C) Wheel and axle

D) Pulley

14. A screw is most closely related to a

A) Cylinder

B) Inclined plane

C) Lever arm

D) Pulley wheel

15. Which simple machine helps to open a bottle cap more easily?

A) Lever

B) Pulley

C) Wedge

D) Spring

16. The point on which a lever turns is called

A) Load

B) Effort

C) Fulcrum

D) Force arm

17. In a seesaw, the fulcrum is usually placed

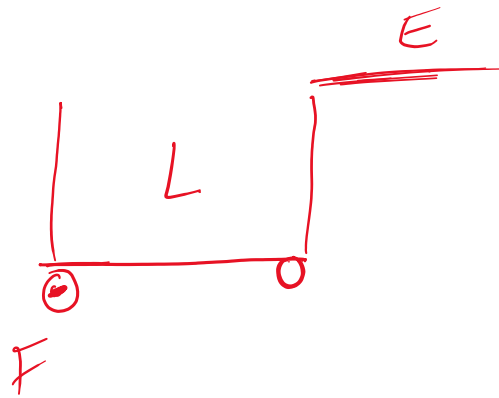
- A) At one end
- B) In the middle
- C) At the load only
- D) At the effort only

18. Which is a first-class lever?

- A) Wheelbarrow
- B) Scissors
- C) Nutcracker
- D) Fishing rod

19. Which is a second-class lever?

- A) Scissors
- B) Pliers
- C) Wheelbarrow
- D) Tongs



20. Which is a third-class lever?

- A) Bottle opener
- B) Fishing rod
- C) Crowbar
- D) See-saw

21. A wheelbarrow is useful because it

- A) Increases load and effort together
- B) Makes the load lighter by magic
- C) Allows effort to be applied between load and fulcrum
- D) Has no friction

22. Which force helps us walk without slipping?

- A) Magnetic force
- B) Frictional force
- C) Nuclear force
- D) Electric force

23. If friction suddenly disappeared, people would

- A) Walk more easily
- B) Slip while walking
- C) Have no weight

D) Lose energy completely

24. A moving bicycle stops after some time mainly because of

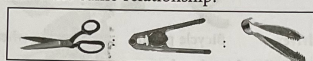
A) Magnetism

B) Friction and air resistance

C) Light

D) Sound

1. Refer to the given relationship and select the option that satisfies the same relationship.



- (A) Pliers : Claw hammer : Tweezers
(B) Claw hammer : Bottle opener : Tweezers
(C) Fishing rod : Sea saw : Claw hammer
(D) Wheelbarrow : Pliers : Tweezers

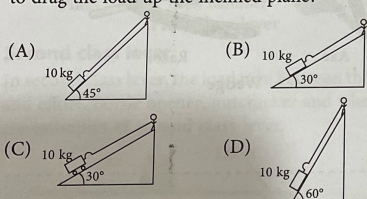
2. Which of the following options shows that force can change the shape of an object?

- (A) Children making toys from clay
(B) Potter making earthen pots
(C) A batsman hitting a ball
(D) Both (A) and (B)

3. Which activity requires a different force than the one involved in rest three activities?

- (A) A plastic ball keeps floating on surface of water kept in a bucket.
(B) A rolling ball on the floor stops after some time on its own.
(C) Wearing and tearing of tyres of an old car.
(D) Heating up of a mechanical device on its continuous usage.

4. In which of the following cases it would be easier to drag the load up the inclined plane?



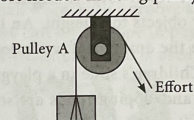
5. Refer to the given picture.

The given structure is a (i), it gains (ii) from (iii). (ii) of (i) is then used to generate (iv) that is supplied to residential areas for running electronic devices.



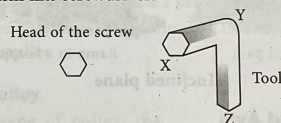
- (A) (i) - Solar panel (B) (i) - Wind turbine
(ii) - Potential energy (ii) - Light energy
(iii) - Wind (iii) - Sun
(iv) - Mechanical energy (iv) - Sound energy
(C) (i) - Wind turbine (D) (i) - Solar panel
(ii) - Kinetic energy (ii) - Mechanical energy
(iii) - Wind (iii) - Wind
(iv) - Electrical energy (iv) - Geothermal energy

6. Which one of the following actions will cause a decrease in effort needed in using pulley A?



- (A) Increasing the length of the string.
(B) Tying the load tightly to the string.
(C) Putting oil in the grooves of the pulley.
(D) Attaching another fixed pulley to the system.

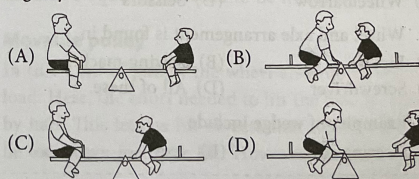
7. The shown tool is a modified wheel and axle mechanism like screwdriver.



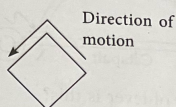
Select the correct option regarding it.

- (A) The given tool belongs to class II lever.
(B) The given tool is a type of simple machine called wedge.
(C) When force is applied at Z then least effort is used to loosen or tighten the screw.
(D) Both (B) and (C)

8. The given picture shows two boys sitting on a see-saw. The big boy weighs 40 kg while the other one weighs 20 kg. Which of the pictures shows the best way for the big boy to balance the small one?



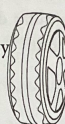
9. When two forces are acting on a box, it turns in the direction as shown in the given figure. Which of the following diagrams correctly shows how the two forces are acting on the box?



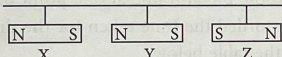
- (A) (B) (C) (D)

10. The given diagram shows a rubber tyre. There are deep treads on the tyre because they

- (A) Increase the stopping distance of the car
(B) Reduce the amount of material used
(C) Enable the tyre to move smoothly
(D) Increase friction.

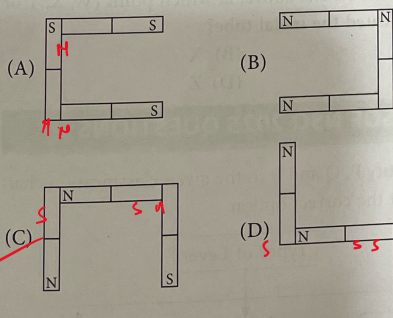


11. What will happen when three bar magnets are hung in the manner as shown in the given figure?

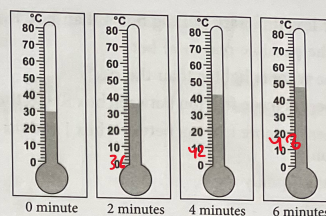


- (A) Nothing will happen.
(B) Magnet Z will turn round and round.
(C) Magnet Y will move towards magnet Z.
(D) Magnet Y will move towards magnet X.

12. Study the arrangement of the bar magnets as shown below. Which arrangement is the possible one?



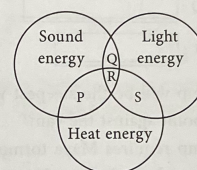
13. A cup of water was heated for six minutes. The given thermometers show the temperature readings during different times of heating.



What can be the temperature when it is heated for five minutes?

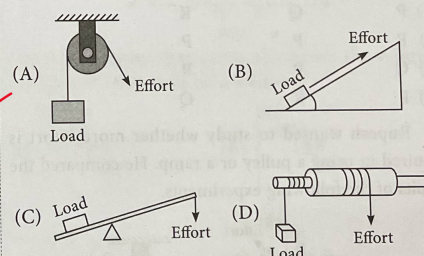
- (A) 37 (B) 48 (C) 45 (D) 42

14. The given Venn diagram is used to classify electrical appliances according to the forms of energy that they convert into from electrical energy, when they are in use. Which of the following best represents a television?



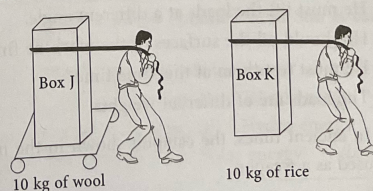
- (A) P (B) Q (C) R (D) S

15. In which of the following machines are the effort and the load equal?



Achievers Section (HOTS)

16. Ritesh tried to pull two different boxes filled with different items as shown in the given figure.



He had less difficulty pulling box J than box K. What could the possible reason(s) be?

- P. The wool is lighter than the rice.
 Q. There is more friction between box K and the floor.
 R. There is more friction between box J and the floor.
 (A) P only
 (B) P and Q only
 (C) Q only
 (D) Q and R only

17. Maya carries out an experiment to find out if the length of a ramp affects the effort taken to push a heavy box up a van.

P :

Q :

R :

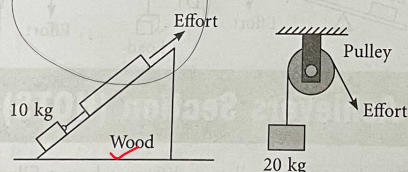
X : Which ramp will be the steepest when placed at the same point against the van?

Y : Which ramp requires Maya to move the box up the van through the longest distance?

Z : Which ramp helps Maya to move the box with least effort?

- | | | |
|-------|---|---|
| X | Y | Z |
| (A) P | Q | R |
| (B) R | P | P |
| (C) Q | P | R |
| (D) P | R | Q |

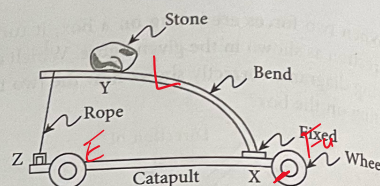
18. Rupesh wanted to study whether more effort is required in using a pulley or a ramp. He compared the results of the following experiments.



Why is this experiment not a fair test?

- (A) He must lift the loads at a different angle.
 (B) He should oil the surfaces of the machine first.
 (C) He must test them at the same time.
 (D) The loads are of different weights.

19. In ancient times, the catapult shown in the figure was used as a weapon.

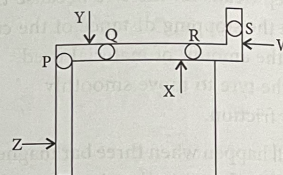


P : Which class of lever is this?

Q : Identify fulcrum, load and effort in the figure.

- | | |
|---------------|-----------------------------|
| P | Q |
| (A) Class I | X-Fulcrum, Y-Load, Z-Effort |
| (B) Class II | X-Effort, Y-Fulcrum, Z-Load |
| (C) Class III | X-Load, Y-Effort, Z-Fulcrum |
| (D) Class II | X-Fulcrum, Y-Load, Z-Effort |

20. The diagram below shows a metal tube with four similar drops of wax attached to position P, Q, R and S on it.



Ravi heated the metal frame at one point on the metal tube and recorded the time taken for the drops of wax to melt in the table below

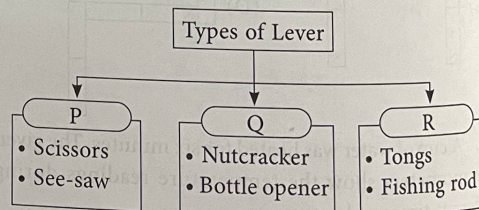
Position of wax drops	Time taken for the wax drops to melt (seconds)
P	26
Q	22
R	32
S	40

Based on the results above, at which point (W, X, Y or Z) Ravi heated the metal tube?

- (A) W (B) X
 (C) Y (D) Z

SOF NSO 2025 QUESTIONS

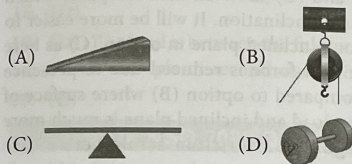
1. Identify P, Q and R in the given classification chart and select the correct option.



P	Q	R
(A) First-class lever	Second-class lever	Third-class lever
(B) Second-class lever	First-class lever	Third-class lever
(C) Third-class lever	Second-class lever	First-class lever
(D) First-class lever	Third-class lever	Second-class lever

(Level-1)

2. Which of the following machines changes the direction of force without reducing the effort?



(Level-1)

3. P is a force that opposes the relative motion between two surfaces in contact.

P could be a force that does not help us to

- (A) Walk
- (B) Hold anything in our hand
- (C) Swim in the swimming pool
- (D) Rub off pencil mistakes using eraser.

(Level-1)

4. Select the incorrect statement.

- (A) Elastic force is a restoring force which helps an object to regain its shape after compression or elongation.
- (B) Muscular force is a type of non-contact force that helps us to lift an object.
- (C) All objects have weight due to gravitational force, existing between them and the Earth.
- (D) Frictional force is more on a rough surface and less on a smooth surface.

(Level-1)

5. Which of the following does not show an effect of force?

- (A) An apple falling down from an apple tree
- (B) A boy playing football kicks the ball towards the goalpost
- (C) Liquid water takes the shape of the glass tumbler in which it is poured
- (D) A matchstick lights up when rubbed against a matchbox

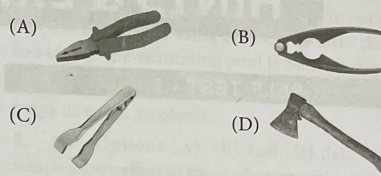
(Level-1)

6. When we switch on a ceiling fan, the electrical energy gets converted into _____.

- (A) Light energy
- (B) Heat energy
- (C) Mechanical energy
- (D) Chemical energy

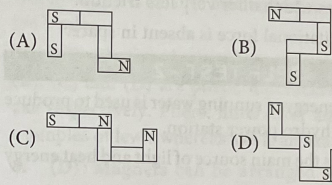
(Level-1)

7. Select the odd one out on the basis of type of simple machine.



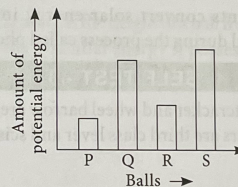
(Level-1)

8. Which of the following arrangements of the bar magnets is not possible?

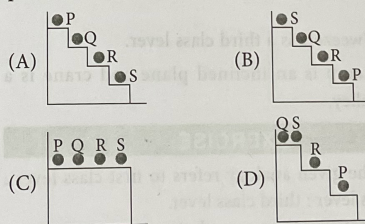


(Level-2)

9. The amount of potential energy possessed by four different balls P, Q, R and S is represented in the given graph.



Select the option that correctly shows the relative positions of these balls on a staircase.



(Level-2)

10. Read the given statement and select the option that correctly fills the given blanks.

The energy obtained from moving water is called (i) _____ while the energy obtained from Sun is called (ii) _____.

- (A) (i) - Wind energy, (ii) - Solar energy
- (B) (i) - Geothermal energy, (ii) - Wind energy
- (C) (i) - Mechanical energy, (ii) - Hydro energy
- (D) (i) - Hydro energy, (ii) - Solar energy

(Level-2)

25. The energy stored in a stretched rubber band is

A) Kinetic energy

- B) Potential energy
- C) Sound energy
- D) Heat energy

26. A ball rolling down a hill changes from

- A) Kinetic to potential energy
- B) Potential to kinetic energy
- C) Heat to light energy
- D) Chemical to sound energy

27. Which of these is a non-contact force?

- A) Push
- B) Pull
- C) Gravity
- D) Muscular force

28. The effort needed to lift a load becomes smaller when using a

- A) Shorter inclined plane
- B) Longer inclined plane
- C) Smaller load
- D) Heavier effort only

29. A knife is an example of a

- A) Lever
- B) Wedge
- C) Pulley
- D) Wheel and axle

30. Which object uses both wheel and axle principle?

- A) Doorknob
- B) Ruler
- C) Chalk
- D) Book

31. Which statement is correct about energy?

- A) Energy can be created from nothing
- B) Energy can be destroyed easily
- C) Energy can change form
- D) Energy is the same as force

32. A student lifts a bag to a shelf. Which pair is correct?

- A) Force and work
- B) Heat and light
- C) Mass and volume
- D) Colour and shape

33. Which of these examples shows force changing the shape of an object?

- A) Kicking a ball
- B) Stretching a rubber band
- C) Reading a book
- D) Drawing a line

34. The force that pulls objects toward Earth is

- A) Magnetic force
- B) Gravitational force
- C) Frictional force
- D) Muscular force

35. A pulley makes work easier mainly by

- A) Increasing gravity
- B) Changing the direction of force
- C) Destroying friction
- D) Making objects lighter

36. Which is a complex machine made of several simple machines?

- A) Lever
- B) Bicycle
- C) Wedge
- D) Pulley

37. A doorknob works as a

- A) Wheel and axle
- B) Lever
- C) Wedge
- D) Inclined plane

38. Which simple machine is a staircase similar to?

- A) Pulley
- B) Inclined plane
- C) Screw
- D) Lever

39. If you push a cart and it moves faster, force has changed its

- A) Colour
- B) Speed
- C) Weight
- D) Shape only

40. When a stone is lifted above the ground, it has

- A) No energy
- B) Potential energy
- C) Sound energy

D) Magnetic energy

41. Which of these is an example of useful friction?

A) Making a sled move

B) Holding a pencil while writing

C) Sliding on ice

D) Rolling on a wet floor

42. A nutcracker is a

A) First-class lever

B) Second-class lever

C) Third-class lever

D) Wedge

43. The load in a lever is the

A) Force used to move the object

B) Object being moved

C) Point of rotation

D) Length of the lever

44. The effort arm is the distance between

A) Load and fulcrum

B) Fulcrum and effort

- C) Load and effort
- D) Two loads

45. Which statement about simple machines is most correct?

- A) They always reduce the distance moved by effort
- B) They make work easier by changing force or direction
- C) They remove the need for energy
- D) They work only in science labs

46. A moving fan uses which energy form most directly?

- A) Kinetic energy
- B) Chemical energy
- C) Potential energy
- D) Nuclear energy

47. Food provides energy because it contains

- A) Chemical energy
- B) Magnetic energy
- C) Sound energy
- D) Elastic energy

48. The head of an axe is shaped like a

- A) Wedge

- B) Lever
- C) Pulley
- D) Wheel

49. A screw turns movement into

- A) Straight-line motion only
- B) Force without motion
- C) Turning into pushing action
- D) Heat into light

50. A ramp helps in loading boxes because it

- A) Increases effort
- B) Reduces effort needed
- C) Stops friction completely
- D) Makes load vanish

51. Which combination best matches the tool? Scissors =

- A) Two wedges only
- B) Two levers and wedges
- C) Two pulleys
- D) Wheel and axle only

52. A fisherman uses a fishing rod because it is a

- A) First-class lever
- B) Second-class lever
- C) Third-class lever
- D) Pulley

53. Which of the following can change both speed and direction of motion?

- A) Force
- B) Mass
- C) Volume
- D) Colour

54. A stationary object begins moving when

- A) No force acts on it
- B) An unbalanced force acts on it
- C) It becomes heavier
- D) It gets brighter

55. Which device uses a pulley system to lift heavy loads?

- A) Well bucket
- B) Knife
- C) Hammer
- D) Pencil sharpener

56. Which form of energy is mainly used by a child running?

- A) Chemical energy stored in food converted to movement
- B) Light energy from shoes
- C) Magnetic energy in the air
- D) Sound energy from the ground

57. If the effort is applied in the middle of a lever, it is usually a

- A) First-class lever
- B) Second-class lever
- C) Third-class lever
- D) No lever

58. Which object is a wedge used for splitting?

- A) A spoon
- B) An axe
- C) A rope
- D) A wheel

59. Why do snow boots or cleats help in movement?

- A) They increase friction
- B) They reduce gravity
- C) They remove energy
- D) They increase mass

60. Which one is the best example of transformation of energy?

A) Electric fan moving air

B) Stone staying still

C) Book on a table

D) Pencil in a box

Answer Key

1. C	24. B	47. B
2. C	25. B	48. B
3. B	26. C	49. C
4. D	27. B	50. A
5. B	28. A	51. A
6. B	29. B	52. A
7. C	30. B	53. B
8. C	31. B	54. B
9. B	32. B	55. B
10. C	33. C	56. A
11. B	34. A	57. B
12. B	35. B	58. B
13. B	36. B	59. C
14. B	37. B	60. B
15. A	38. B	
16. C	39. A	
17. B	40. B	
18. B	41. C	
19. C	42. B	
20. B	43. B	
21. C	44. B	
22. B	45. B	
23. B	46. B	