Solution of Questions For Short Answer

Chapter 8 : Work and Energy

Ans. 1.
No it is not, as the box was at rest when it was n the floor and it is now at rest as it is on the top of almirah.
As the energy transferred by you to the box would add up to the potential energy so the potential energy would increase as over all energy would also increase. thus no rule is violated.

Ans. 2.
Yes the kinetic energy will depend on the angle of declination as if angle of declination increases (w.r.t. vertical axis) the kinetic energy will decrease. yes we need more information as the height of the particle and angle it makes w.r.t. vertical axis or horizontal axis.

Ans. 3.
No kinetic friction of a body always acts in opposite direction so as to oppose motion of the body so it can not be positive but it can be zero in case of zero friction. (except considering different frame of references)

Ans. 4.
No, static friction does not work because no distance is traveled when an object is static (static means not moving).
(except considering different frame of references)

Ans. 5.
A force does work if the force is not 0 and if the angle between the force and the displacement is not 90 degrees.
Work = Force x Displacement x Cos(theta) so as in normal force angle is 90 degree

Ans. 6.
Yes in case of two charged particles there is no external force applied but the kinetic energy increases as particles move closer to each other.
a similar case may b of freely falling body.

Ans. 7.
Yes , in case of pseudo forces work energy theorem is valid.
for example when you are inside car you feel acceleration or deceleration that is pseudo force acting on you. so work is done on you even while you are in non-inertial frame.

Ans. 8.
No as W=F*d*cos theta so work done only depends upon displacement not on time.
Yes as inclination (angle increases) the work done by gravity on the box increase (as it will be harder to move box upward). work done by gravity will act in opposite direction to the force applied by you on the box

Ans. 9.
Yes one of them must be wrong as the potential energy of a static object is constant.

Ans. 10.
One of them must be wrong because the work done on lifting the book would be a constant so energy must be increased by unique constant value.

Ans. 11.
As the displacement in ball is negative so work done is negative and while expansion the displacement is positive hence work done is positive.

Ans. 12.
a) Work done by winning team is positive as displacement is positive
b) Work done is negative as displacement is negative
c) Work done by ground on winning team is postive as team is going back
d) Work done by ground on losing team is negative as team is moving forward even though they are pushing backward.
e) Total external work done is zero as force exerted by teams on ground resulted in zero displacement.

Ans. 13.
Its potential energy reaches nearly around zero as it strikes ground its potential energy becomes zero.

Ans. 14.
This energy comes from gravitational force acting upon bike and you, as you push ground using your muscles to go upward due
to height you potential energy increases.

Ans. 15.
Magnetic force acting on particle can change path of the particle as due to change in angle or deflection in path displacement of particle may change but not distance(curved path) so velocity of the particle may change but speed may not.

Ans. 16.
Initial kinetic energy is 1/2(m*v^2) where m is mass of ball.
Final energy is zero as ball has stopped.
Work done by kinetic friction is W=F*l as l is the distance covered by ball and F is kinetic energy.

Ans. 17.
In case of moving frame
Initial energy would be 1/2 m *(V+ Vo)^2 or 1/2 m*(V-Vo)^2
Final energy would be 1/2*m*Vo^2
Work done by the kinetic friction is same in this case. as change in energy is same.