Hw

(1) (2) ✓

(2) $s_A = 10t$

$s_B = \frac{1}{2} at^2 = \frac{1}{2} t^2$ ($A_{sa} = \tan 45^\circ = 1$)

$s_A + 10.5 = \frac{1}{2} t^2$

Thus, we get the eq. as;

$10.5 + 10t = \frac{1}{2} at^2$.

$\Rightarrow t^2 - 20t - 21 = 0$

$\Rightarrow t = \frac{20 \pm \sqrt{400+84}}{2} = 21$ sec.

(3) (A) → (s), (B) → (r), (C) → (p), (D) → (q).

(4) (a) Uniform motion from A to B & non-uniform motion from B to C.

(b) AB because velocity remains constant from A to B.

(c) BC because velocity decreases from B to C.

(5) (i) OA represents uniform acceleration since the slope of OA in the velocity-time graph is having a uniform positive slope.
AB represents the uniform velocity of $20ms^{-1}$.
Since, the slope of AB is 0, Hence, acceleration is 0.

(ii) After 10s, the velocity is $20ms^{-1}$ upto 30s & after 30s, the velocity is uniformly restarted to 0 after 40s.

(iii) Slope of $BC = \frac{BD}{DC} = \frac{20}{40-30} = 2ms^{-2}$.
And acceleration $= -2ms^{-2}$.

(4) 400m.