Electromagnetism

① $F = BIL$

$= (0.2)(15)(0.25)$

$F = \boxed{0.75\ N}$

② $F = BIL$

$L = \frac{F}{BI}$

$= \frac{0.1}{(0.033)(20)}$

$L = \boxed{0.15\ m}$

③ $F = BIL$

$B = \frac{F}{IL}$

$= \frac{6 \times 10^{-5}}{(1.5)(1)}$

$B = \boxed{4 \times 10^{-5}\ T}$

④ $F = BIL \sin\theta$

$= (5\times10^{-5})(200)(50)\sin 45$

$F = \boxed{0.35\ N}$

⑤ $B = \dfrac{F}{IL}$

$= \dfrac{0.4}{(20)(0.15)}$

$B = \boxed{0.13\ T}$

⑥ $F = BIL \sin\theta$

$= (0.5)(4)(0.25)\sin 45$

$F = \boxed{0.35\ N}$

⑦ $F = F_g$

$BIL = mg$

$I = \dfrac{mg}{BL}$

$= \dfrac{(0.015)(9.8)}{(0.2)(0.4)}$

$I = \boxed{1.84\ A}$

⑧ $F = BIL$

$= (0.4)(8)(0.5)$

$F = \boxed{1.6\ N}$

⑨ $B = \dfrac{F}{IL}$

$= \dfrac{0.6}{(6)(0.25)}$

$B = \boxed{0.13\ T}$

⑩ $B = \dfrac{F}{IL}$

$= \dfrac{0.35}{(6)(0.4)}$

$B = \boxed{0.15\ T}$

⑪ Parallel to the Field, so that $\theta = 0$.

Then $F = BIL\sin\theta$ becomes

$= BIL\sin 0$

$F = 0$

(12) a) $F = BIL$

$= (5 \times 10^{-5})(225)(1)$

$F = \boxed{0.011 \text{ N}}$

b) down

c) No. Over a 50 m span, the force is only 0.55 N. This is insignificant when compared to the weight of the wire.