STA 502. Problem set 3.

Q6.

The regression model is that:

$$y = 2.939 + 0.046(TV) + 0.189(Radio) - 0.001(Newspaper) + \varepsilon.$$

I guess the researcher the model made expected that
  TV, Radio and Newspaper advertisements don't affect profits.
According to the table (including t-values and p-values),
TV and Radio advertisements show less positive affect profits.
By comparison, Newspaper advertisement doesn't affect them.

Q7.

(1) The correct answer is the third one.

→ X_1: Distance X_2: Holiday X_3: Interaction Distance & Holiday
                            (Dummy)

$$y = 100 + 0.2x_1 + 40x_2 + 0.05x_3 + \varepsilon$$

$$\hat{Y}_{Holiday} = \hat{y}_H = 100 + 0.2x_1 + 40 + 0.05x_1$$

$$\hat{Y}_{usual} = \hat{y}_U = 100 + 0.2x_1$$

$$\Downarrow Average$$

$$\hat{Y}_H : \bar{y}_H = 100 + 0.2x_1 + 40 + 0.05x_1$$
$$\hat{Y}_U : \bar{y}_U = 100 + 0.2x_1$$
_____
$$40 + 0.05x_1$$

→ For a fixed value of Distance, The Ticket price is more expensive
on holidays than on usual days. So long as. Distance is long enough.

Qn-2. $X_1 = 1000$ ... the average holiday price of ticket?

→ $\bar{y}_H = 100 + 0.2\,(1000) + 40 + (0.05 \times 1000)$

      $= 100 + 200 + 40 + 50$

      > 390

                              ∴   390 $

Qn-3.   False,

Statistical significance and Magnitude of interaction are
both different terms and statistical significance depends on the p-value.
The very small coefficient doesn't indicate a very little of an interaction.