第41回 2級 問4

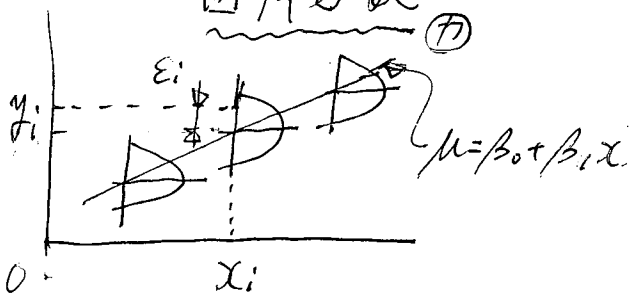
①

$$y_i = \beta_0 + \beta_1 x_i + \varepsilon_i \quad (i = 1, 2, \cdots, 20)$$

目的変数　切片　回帰係数　説明変数

回帰係数 ㋔

回帰母数 ㋕



ε_i は互いに独立に $N(0, \sigma^2)$ に従う

不偏性，等分散性，独立性，正規性 ㋑

(21) エ

②

$$\hat{\beta}_1 = \frac{S_{xy}}{S_{xx}}, \quad \hat{\beta}_0 = \bar{y} - \hat{\beta}_1 \bar{x}$$

(22) キ

$$\beta_0 = 95.93 - 0.112 \times 55.5 = 89.714 \fallingdotseq 89.71$$ ㋓

(23) カ

(24) ケ

③

$$S_R = \frac{S_{xy}^2}{S_{xx}} = \frac{274.9^2}{2445} = 30.90797 \fallingdotseq 30.91$$ ㋕

$$\phi_R = 1, \quad V_R = \frac{S_R}{\phi_R} = 30.91$$

(25) カ

$$S_e = S_T - S_R = 35.8 - 30.91 = 4.89$$

$$\phi_e = \phi_T - \phi_R = 19 - 1 = 18$$

$$V_e = \frac{S_e}{\phi_e} = \frac{4.89}{18} = 0.27166\cdots = 0.272$$

$$F_0 = \frac{V_R}{V_e} = \frac{30.91}{0.272} = 113.6397 \fallingdotseq 113.64$$ ㋐

(26) エ

$$F(\phi_R, \phi_e; {}^{0.05}_{0.01}) = F(1, 18; {}^{0.05}_{0.01}) = {}^{4.41}_{8.29}$$

④

残差の検討 ㋔

回帰診断 ㋒

(27) キ

(28) ウ