**EE3211 Modelling Techniques**

**Week 6 Assignment Answer**

**Q1.**

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**Q2.**

Y = 22.495 + 0.467\*15 =9.5, because y is in the units of birthweight (g)/100, the estimated average birthweight = 29.5 \* 100 = 2950g.

**Q3.**

Note that the predicted value of y is y = 22.495 + 0.467\*x

If y = 2500/100 = 25, then x can be obtained from the equation

25 = 22.495 + 0.467\*x, x = 5.364

Thus, if a woman has an estriol level of 5.364 mg/24 hr, then the predicted birthweight is 2500 g.

**Q4.**

x<-c(7,9,9,12,14,17,25,27,15,15)

y<-c(25,25,25,27,27,32,32,34,34,34)

model <- lm(y~x)

summary(model)

Call:

lm(formula = y ~ x)

Residuals:

Min 1Q Median 3Q Max

-2.1701 -1.6980 -1.1015 0.9835 4.5000

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) 22.4949 2.2541 9.980 8.62e-06 \*\*\*

x 0.4670 0.1386 3.369 0.0098 \*\*

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 2.752 on 8 degrees of freedom

Multiple R-squared: 0.5865, Adjusted R-squared: 0.5349

F-statistic: 11.35 on 1 and 8 DF, p-value: 0.009802

**Q5.**

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Furthermore,

Therefore,

Reg SS = = Reg MS = 184\*184/394=85.929

Total SS =

Res SS = Total SS – Reg SS = .5-85.929=60.571

Res MS = Reg SS / (n-2) = 60.571 / (10-2) = 7.571

F = Reg MS/Res MS = 85.929 / 7.571= 11.349,

Therefore, P-value < 0.01

and H0 is rejected and the alternative hypothesis, namely that the slope of the regression line is significantly different from 0, is accepted, implying a significant linear relationship between birthweight and estriol level.