Answer to the ques no 3:

**(a)**.

i) For a fixed value of IQ and GPA, high school graduates earn more, on average, than college graduates.

* This statement contradicts the coefficient β3=35 for the Level predictor. The positive coefficient for Level (where 1 represents college and 0 represents high school) suggests that, on average, college graduates (X3=1) earn more than high school graduates (X3=0) when controlling for other variables.

ii) For a fixed value of IQ and GPA, college graduates earn more, on average, than high school graduates.

* This aligns with the interpretation of the positive coefficient β3=35 for the Level

predictor. Thus, for a fixed value of IQ and GPA, the model suggests that college graduates earn more.

iii) For a fixed value of IQ and GPA, high school graduates earn more, on average, than college graduates provided that the GPA is high enough.

* This statement can't be supported by the information provided in the coefficients. There's no indication that high school graduates would earn more than college graduates, especially when the GPA is high. The interaction term between GPA and Level (β5=10) doesn't imply this relationship.

iv) For a fixed value of IQ and GPA, college graduates earn more, on average, than high school graduates provided that the GPA is high enough.

* This aligns more with the interpretation of the coefficients, especially the positive coefficient for Level (β3=35). However, the information about GPA's impact on this relationship isn't explicit in the given coefficients.

**(b)** To predict the salary of a college graduate with an IQ of 110 and a GPA of 4.0:

Salary = β0 + β1\*GPA + β2\*IQ + β3\*Level + β4\*(GPA\*IQ) + β5\*(GPA\*LEVEL)

Plugging in the values:

Salary = 50 + 20\*4.0 + 0.07\*110 + 35 + 0.01\*(4.0\*110) + 10(4.0\*1)

= 50 + 80.0 + 7.70 + 35 + 4.400 + 40.0

= 217.100

**c) True or false**: Since the coefficient of the GPA/IQ interaction term is very small, there is very little evidence of an interaction effect.

* **False.** The small coefficient for the GPA/IQ interaction term β(β4=0.01) doesn't necessarily indicate a lack of interaction effect. Interaction effects can still be present even with small coefficients. The presence or absence of an interaction effect should ideally be tested using statistical methods like hypothesis testing or examining the practical significance of the interaction term rather than relying solely on the magnitude of the coefficient.