1.

A. Aggregation of data to macro level units runs the risk of the ecological fallacy, where you cannot infer that a macro association translates into the same micro effect.

B. Disaggregation of data to micro level units runs the risk of the ecological fallacy, where you cannot infer that a macro association translates into the same micro effect.

C. Aggregation of data to macro level units runs the risk of the ecological fallacy, where you cannot infer that a micro association translates into the same macro effect.

D. Disaggregation of data to micro level units runs the risk of the ecological fallacy, where you cannot infer that a micro association translates into the same macro effect.

2. In a random effects ANOVA, $Y_{ij} = \gamma_{00} + u_j + \varepsilon_{ij}$

A. γ_{00} is the fixed intercept term, u_j a residual effect at individual level, and ε_{ij} a random effect at group level

B. γ_{00} is the random intercept term, u_j a residual effect at individual level, and ε_{ij} a random effect at group level

C. γ_{00} is the random intercept term, u_j a random effect at group level, and ε_{ij} a residual effect at individual level

D. γ_{00} is the fixed intercept term, u_j a random effect at group level, and ε_{ij} a residual effect at individual level

3.

For a random effects ANOVA, the intra class correlation is

A. the proportion of variance explained by the group

B. the correlation between two randomly drawn individuals in one randomly drawn group

C. the variance of the intercept as a proportion of total variance

D. All of the above

4. The following output was obtained for a random effects ANOVA

Estimates of Covariance Parameters[a]

Parameter		Estimate	Std. Error	Wald Z	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Residual		38.986611	1.193325	32.671	.000	36.716512	41.397064
Intercept [subject = class]	Variance	6.735678	1.253613	5.373	.000	4.676916	9.700698

a. Dependent Variable: test.

A. Because the intercept variance is significant, the ICC will be small and the group structure is not important

B. Because the residual variance is not significant, the ICC will be small and the group structure is not important

C. Because the intercept variance is significant, the ICC will be large and the group structure is important

D. Because the intercept variance is significant, the ICC will be large and the group structure is not important.

5. For a random intercept multilevel model, $Y_{ij} = \beta_{0j} + \beta_1 X_{ij} + \varepsilon_{ij}$ with $\beta_{0j} = \gamma_{00} + u_{0j}$ and $\beta_1 = \gamma_{10}$

A. There are two fixed and two random/residual effects

B. There are three fixed and one random/residual effect

C. There are one fixed and three random/residual effects

D. There are four fixed effects.

6. In a random intercept multilevel model, we obtain the following output:

Estimates of Fixed Effects[a]

Parameter	Estimate	Std. Error	df	t	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Intercept	57.595965	.132905	375.699	433.362	.000	57.334634	57.857296
ses	3.873861	.136624	3914.638	28.354	.000	3.605999	4.141722

a. Dependent Variable: math.

A. There is a significant positive association between *math* and *ses*

B. There is a positive association between *math* and *ses* but it's significance needs to be assessed using the estimates of covariance parameters.

C. The slope varies around a mean value of 3.88

D. None of the above.

7. $Y_{ij} = \gamma_{00} + \gamma_{10} (SES)_{ij} + u_{0j} + \varepsilon_{ij}$

A. If $\gamma_{00} = 0$, we have a random effects ANOVA

B. If $\gamma_{10} = 0$, we have a random effects ANOVA

C. If $u_{0j} = 0$, we have a random effects ANOVA

D. If $\varepsilon_{ij} = 0$, we have a random effects ANOVA