تلخيص القوانين

سأعتمد هذا المثال لكي ترى ما هي احتمالات الأسئلة عليها

The 2 x 2 table below reveals screening test results for disease Y which are tabulated in relation to the true disease status of the population being tested. From the calculation results coming after, you are going to choose the required answers:

Screening test	Disease (Y) Yes	Disease (Y) no	Total
Positive	200	100	300
Negative	50	600	650
Total	250	700	950

A- **If he asks about Sensitivity of the screening test. Then:**
Sensitivity = True Positive/Total Diseased Persons = 200/250 or 80%
Or if he asks you about Detection Rate or What is the probability of a person with the disease to have Positive Result, he also means Sensitivity

B- **If he asks about Specificity of the test then:**
Specificity = True Negative/Total Non Diseased Persons = 600/700 or 86%
Or if he asks What is the probability of a person with the no disease to have the negative result, he also means Specificity

C- **If he asks about False Positive Rate Then:**
False Positive Rate= False positive / Total Non Diseased Persons = 100/700 or 14%
Or we could calculate it by = 1-Specificty = 1-(600/700) = 100/700 or 14%
Also if he asks you what is the probability of a person with no disease to have positive result , he also means False Positive Rate

D- **If he asks about False Negative Rate Then:**
False Negative Rate= False Negative / Total Diseased Persons = 50/250 or 20%

Or we could calculate it by = 1-Sensetivity = 1-(200/250) = 50/250 or 20%
Also if he asks you what is the probability of a person with the disease to have negative result , he also means False Negative Rate

E- **If he asks you about Positive predictive value of the test then:**
Positive predictive value= True Positive/Total Positive = 200/300
Also if he asks you what is the probability of a person with positive test to have the disease he also means Positive predictive value
Remember: Positive Predictive Value are related to Prevalence
When Prevalence increases it also increases and vice versa

F- **If he asks you about Negative predictive value of the test then:**
Negative predictive value= True Negative/Total Negative = 600/650
Also if he asks you what is the probability of a person with negative test to not have the disease , he also means Negative predictive value

G- **If he asks about Positive likelihood ratio then:**
Positive likelihood ratio= Sensitivity/(1-Specificity) Or Sensitivity/False Positive Rate= 80/(1-86)
or if he asks you how many times a person with positive test will have the disease , he means also about Positive likelihood ratio

H- **If he asks about Negative likelihood ratio then:**
Negative likelihood ratio= (1-Sensitivity)/Specificity Or False Negative Rate/Specificity= (1-80)/86
or if he asks you how many times a person with negative test will have the disease , he means also about Negative likelihood ratio

I- **Disease Prevalence : Total Diseased Persons /Total All = 250/950**

Rules From Other Lectures:
Secondary Attack Rate= Number Of exposed Persons developing the disease within the range of incubation period / (Total Number Of Exposed/Susceptible Contacts)
Infectivity (ability to infect) = (number infected / number susceptible) x 100
Pathogenicity (ability to cause disease) = (number with clinical disease / number infected) x 100
Virulence or Case Fatality Rate (ability to cause death) = (number of deaths / number with disease) x 100

Reproductive Number R0= P * C * D
Where P= Probability of transmission per contact, C= Contacts Per Unit Time, D= Duration of infectiousness

IF R0 > 1 (Disappearance of Disease)
IF R=1 (Disease Become Endemic)
IF R>1 (Disease Become Epidemic)

Herd Immunity (R):
R = R0 – (p * R0)
R= Reproductive number in immunized Population
R0 = Reproductive Number Before Immunization
p = Proportion(Percentage) of Population Which Get Immunized

For A population To Be protected R must be Less Than 1
To Achieve That p > 1-(1/R0)

If R0 Increased , p also increase and vice versa

Rules of Standardization Are explained Well In the Last Part Of The Note

Good Luck

For A population To Be protected R must be Less Than 1
To Achieve That p > 1-(1/R0)