1. The Scandinavian simvastatin survival study was a randomized clinical trial designed to evaluate the effects of the cholesterol-lowering agent simvastatin in patients with coronary heart disease. Over 5.4 years of follow-up, the treatment group consisting of 2221 individuals experienced 111 fatal heart attacks. The placebo group of 2223 individuals experienced 189 such events. Calculate the risks in the groups and test the difference for significance. In relative terms, how much did simvastatin lower heart attack mortality ? **(15%)**

2. Define each of the following terms: **(25%)**

 (a) Predictive value of a positive test
 (b) Point estimation
 (c) Coefficient of determination
 (d) Dummy variables
 (e) One-way ANOVA

3. Approximately 12 percent of the deaths in children aged five through nine in Taiwan in 1990 were due to cancer. In contrast, approximately one-fourth of the deaths at ages 60 to 64 were due to this condition. Is it correct to say that the risk of death from cancer was approximately twice as great in the older age group? If not, why not? **(10%)**

4. In a cohort study following up 7000 people for an average of 5 years, 3000 people took a vitamin supplement and 4000 did not. There were 57 cases of cancer in the vitamin supplement group, and 43 cases of cancer in the other group.
 (a) Calculate the incidence rate in each group. **(7%)**
 (b) What information do these findings offer for concluding that　vitamin supplementation increases the risk of cancer? **(8%)**

5. Defining relative risk and briefly outline its value in　epidemiology. **(10%)**

6. A population register assessed the incidence of heart attacks by ethnic group in the UK population. The following data were obtained after one year of follow up:

White ethnic group

Age group	Cases of heart attack	Total number of people in study
45-54	5	7500
55-64	24	6500
65-74	37	4500
75+	71	3200
Total	137	21700

Indian ethnic group

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Age group   Cases of      Total number of
            heart attack  people in study
--------------------------------------------
45-54          3            1800
55-64          6            1500
65-74          8             800
75+           10             400
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Total         27            4500
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(a)Calculate the age-specific and overall incidence rates of heart attack per 1000 population for the White and Indian ethnic groups. **(7%)**

(b)Calculate the indirectly standardized rate-summarized as a standardized morbidity ratio (SMR) of heart attack for Indian ethnic groups using the White population rates as the reference population **(8%)**.

7. If X and Y are two quantitative variables, please identify which   of these statements are true and which are false. **(10%)**.

(a)Correlation coefficient r quantifies the relationship between X and Y.

(b)The closer r is to -1 or 1, the stronger the linear relation between X and Y.

(c)If r is close to zero, X and Y are not related in a linear way.

(d)The value of r changes when the units of measure are changed.

(e)The value of b (regression coefficient) changes when the units of measure are changed.