



**MBA HOSPITAL & HEALTH MANAGEMENT
I YEAR
ESSENTIALS OF EPIDEMIOLOGY FINAL EXAMINATION
Friday, October 14, 2016**

Time: 2.00 hours

Maximum Marks - 70

Instructions:

1. This question paper contains **07 printed sides** and has two sections.
2. Please **ensure** that your paper has both the sections.
3. Attempt all questions on this paper and **return it to the invigilator** at the end of the exam.

Roll Number

Batch

Section

Date

Signature of Invigilator _____

Marks obtained

Signature of Examiner _____



Section A

Circle true (T) or false (F)

1 marks each

1. T/F Incidence rate is a measure of cases of a disease present in the community in period of time.
2. T/F In a Ratio, the Numerator is part of Denominator.
3. T/F In age specific rates, the denominator should be the population in that age specific group.
4. T/F The proportional mortality rate is percent deaths caused by a disease out of total deaths due to all causes.
5. T/F The point prevalence rate is the proportion of the population that has an outcome/disease at a specific point in time.
6. T/F When we use Person years of exposure as denominator to measure outcomes in Cohort Studies, the main assumption is that One year is equal to One person.
7. T/F A screening test should be both reliable and valid.
8. T/F The sensitivity of screening test is the proportion of people who have the disease classified correctly as not having the disease by the screening test.
9. T/F Positive Predictive Value of a Screening Test is the proportion of test positive cases out of total True positives cases.
10. T/F I hypothesis testing, Type II error occurs when groups are not different in reality, but the test result shows they are different.
11. T/F It is important to test for statistical significance for establishing causal association between risk factor and the disease
12. T/F Descriptive studies help us in testing the hypothesis of cause and effect relationship.
13. T/F Causality cannot be determined by cross-sectional studies because temporal relationship cannot be demonstrated.
14. T/F In a Randomized Clinical Trial, the study population is composed of study subjects randomly assigned as treatment or control group.
15. T/F A Confounding factor may affect the estimates of risk.
16. T/F In Randomized Control Trials, comparability of the characteristics of the study and the placebo group is essential to control the effect of confounding factors.
17. T/F In the cohort study design, the subjects are free from the disease under study at the start of the study.
18. T/F A relative risk equal to 1 signifies that there is no association between the risk factor and the disease.
19. T/F Cohort Studies are appropriate when the disease is rare and the exposure is common.
20. T/F Odds Ratio in case control study is equivalent of relative risk as measured in cohort studies.



Section B

2 marks each

In this section, there are multiple choices for each question. There is one correct answer. CIRCLE the correct answer:

1. Incidence Rate measures:
 - a) Frequency occurrence of new cases
 - b) Magnitude of old cases
 - c) Magnitude of old and new cases
 - d) Number of cases attributed to a cause
 - e) None of the above
2. As a manager, which of the following health statistics would you use to select a risk factor to target for intervention in order to have the greatest health impact in the limited resource settings?
 - (a) Incidence Rate.
 - (b) Attributable Risk
 - (c) Prevalence Rate.
 - (d) Relative risk of the disease
 - (e) Proportionate mortality.
3. In a hospital 5000 patients with various diseases were admitted in a year. During the year 1000 patients died from various causes during the year. Out of these deaths, 30 patients died of Gall bladder cancer. The proportional mortality rate for Gall bladder cancers in the hospital is:

a) 6.0 %	d) 10.0%
b) 20.0%	e) 3.0%
c) 40.0%	
4. In order to assess how strongly related an exposure is to a disease, which would be the best health statistic?
 - a) Incidence of the disease
 - b) Attributable risk
 - c) Prevalence of the exposure
 - d) Relative risk
 - e) Proportionate mortality
5. Following are the criteria for establishing cause and effect relationship between the risk factor and disease:
 - a) Dose response
 - b) Temporal relationship
 - c) Strength of Association
 - d) Biological Plausibility
 - e) All above

6. A cohort study of women aged 20 to 25 years in India found that the Incidence rate of cervical cancer in women who used oral contraceptives was 5/100,000 and that it was 2/100,000 in those who did not use oral contraceptives. On the basis of these data, the inference that taking oral contraceptives causes cervical cancer is
- Correct
 - Incorrect due to failure to distinguish between incidence and prevalence
 - Incorrect due to failure to adjust for confounding factor (age) for possible difference in age distribution of users and nonusers
 - Incorrect because there was a selection bias.

Questions 7, 8, 9 and 10 are based on the data available from as cohort study.

A cohort study, with 3000 smokers and 5000 non-smokers was conducted to assess the risk of CHD. The data is given in the following table:

	Develop CHD	Did not develop CHD	Total
Smokers	90	2910	3000
Non-Smokers	45	4955	5000

7. Incidence rate of CHD among Smokers is
- 30 per 1000
 - 10 per 1000
 - 28 per 1000
 - 18 per 1000
8. The Relative Risk is:
- 1.6
 - 1.2
 - 3.3
 - 1.0
9. Odds Ratio is
- 1.6
 - 2.0
 - 3.4
 - 1.0
10. Attributable Risk is
- 37.9
 - 17.4
 - 23.0
 - 42.9
11. Which of the following statements describes the major advantage of a randomized clinical trial?
- It avoids observer bias.
 - It lends itself to ethical justification.
 - It yields results replicable in other patients.
 - Selection bias is reduced or eliminated
 - It enrolls representative patients required to support the inference



12. A "double blind" randomized study of a vaccine is one in which:
- The study group receives the vaccine and the control group receives a placebo.
 - Neither observer nor subjects know the nature of the placebo.
 - Neither observer nor subjects know which subject receives the vaccine and which receives a placebo.
 - Neither the study group nor the control group knows the identity of the observers.
 - The control group does not know the identity of the study group.
13. In vaccine trial 2,000 randomly selected children two years of age were given polio vaccine against a poliomyelitis. The vaccinated children were followed for 10 years for occurrence of the poliomyelitis. Of these, 80% were never afflicted with the disease. Which is the most correct conclusion regarding the efficacy of the vaccine?
- The vaccine is an excellent one because of the high rate of immunization.
 - No conclusion is possible since there was no comparison group of non-vaccinated children.
 - The vaccine is not very effective because it should have produced a higher immunization rate.
 - No conclusion is possible since no test of statistical significance was performed.
 - The significant figure is $100\% - 80\% = 20\%$, the rate of acquiring the illness.
14. A Randomized double blind placebo controlled field trial was conducted to test the vaccine efficacy of new HiB vaccine (Influenza Vaccine) among children up to five years of age. 1000 children each were randomly allocated to Vaccine Group and Placebo group. At the end of one year of follow up, the incidence of Influenza was 10 per 1000 in the vaccine group, and 60 per 1000 in the placebo group. The true estimate of the vaccine efficacy is:
- 80%
 - 65%
 - 40%
 - 90%
 - 10%

Questions 15, 16 and 17

A screening test for breast cancer was administered to 1000 women with biopsy-proven cervical cancer and to 1000 women without cervical cancer. The test results were positive for 900 of the proven cases and 100 of the normal women. Use these data for the question 13, 14 & 15:

15. The sensitivity of the test is:
- | | |
|---------|---------|
| (a) 40% | (d) 90% |
| (b) 80% | (e) 10% |
| (c) 25% | |



16. The specificity of the test is:
- (a) 90% (d) 10%
 (b) 80% (e) 12%
 (c) 25%
17. The Predictive Value for positive test
- a) 94.9% d) 70%
 b) 90% e) 99%
 c) 82.5%
18. Following table shows the relative frequency of newly reported cancers of specific sites in two populations:

Site of Cancer	Percent of Total	
	Population A	Population B
Lung	10.0	6.7
Breast	30.0	20.0
Uterus	25.0	16.7
All Other	35.0	56.6
Total: All sites	100.0	100.0

The inference that population A seems to be more prone to cancer of the lung of the lung, breast, and uterus than is population B is

- a) Correct
 b) Incorrect because of failure to distinguish between incidence and prevalence
 c) Incorrect because a proportion is used when a rate is required to support the inference
 d) Incorrect because there is no control or comparison group.
19. Prevalence of a disease can help us estimate all EXCEPT
- a) Burden of the disease
 b) Absolute Risk
 c) Likelihood of the diagnosis
 d) Predictive value of a diagnostic / screening test
20. All are types of descriptive studies EXCEPT
- a) Case Reports
 b) Case Series
 c) Case Control Studies
 d) Cross Sectional Studies



21. A Cross-sectional study/survey that includes the entire household population is referred to as a
- Cohort Study
 - Longitudinal Study
 - Public opinion poll
 - Census
22. All are INCORRECT about Cross-sectional studies EXCEPT
- Both exposure and disease can be measured
 - Temporal Association can be determined
 - Incidence can be measured
 - It is not possible to estimate prevalence
23. A Case Control study is characterized by all except the following:
- It is relatively inexpensive
 - Relative risk may be estimated from the results.
 - Incidence rates may be computed.
 - One may select controls without the disease
 - Assessment of past exposure may be biased.

Questions 24 and 25

A Case Control Study was conducted to assess the risk of Myocardial Infarction among women recently used Oral Contraceptives. The data is given in the following table:

Exposure Status	MI Cases	Controls
Used OC	29	135
Did not Use OC	205	1607

24. Odds Ratio is:
- 1.68
 - 36.00
 - 0.59
 - 0.027
 - Not possible to calculate
25. There are multiple factors that may associated with increased risk Myocardial Infarction. To evaluate the effect of OC use, which of the risk factors you would like to adjust for confounding, except:
- Smoking
 - Age
 - Serum Cholesterol levels
 - Blood Pressure
 - Place of residence

*****End of the Question Paper*****

