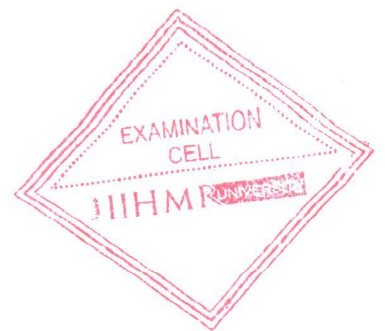




Roll No.

Section – A

Time - 30 Minutes

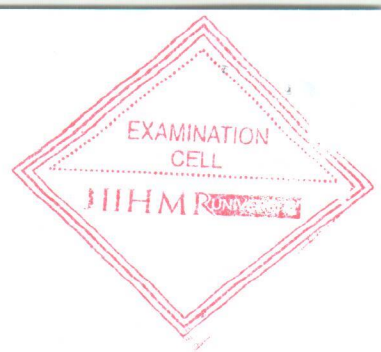
Maximum Marks – 20

Note:

- 1) All questions are compulsory. In MCQs, encircle **OR** use ✓ mark to answer
- 2) *Section A has to be completed and returned to the invigilator within first 30 minutes.*

Write appropriate study designs for the scenarios given below

Q	Situation	Answer/ study design
1.	Representative sample of residents were surveyed and asked how much they exercise each week and whether they currently have or have ever been diagnosed with hypertension	
2.	Air Quality index of 15 Indian cities having population more than one million was obtained. Prevalence of Cardiovascular disease among traffic policemen was obtained through occupational health records. Finally, correlation between air quality index and prevalence of traffic policemen was studied.	
3.	A study was undertaken to test link between occupational exposure to uranium and lung cancer. Persons diagnosed with lung cancer were asked about occupational exposure to uranium, from same company persons not having lung cancer were asked about their occupational exposure to uranium.	
4.	Children below 2 years attending outpatient clinic of paediatric hospital and suffering from pneumonia were randomly assigned to two groups- one group received new antibiotic for pneumonia and other received standard therapy. The outcome measured was pneumonia cure rate in both groups	
5.	Association between lung cancer and smoking was studied in workers of IT company. Based on annual health examination records two groups were formed: smokers and non-smokers. Occurrence of lung cancer was studied between April 1991 and July 2002	



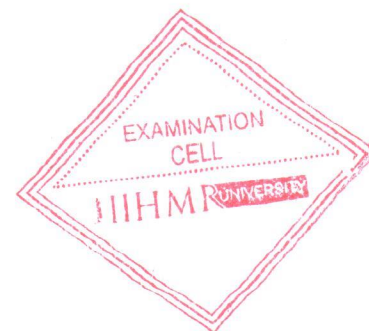
1. Descriptive studies perform all the following functions. Except:
 - (a) Test hypothesis
 - (b) Describe disease occurrence by time
 - (c) Describe the place distribution of health-related event
 - (d) Generate hypothesis
2. It is sometimes difficult to establish temporal association in the following study design:
 - (a) Experimental study
 - (b) Cohort study
 - (c) Cross - sectional study
 - (d) All the above.
3. Cause effect relationship can be tested by the following study designs Except:
 - (a) Ecological study
 - (b) Case -control study
 - (c) Cohort study
 - (d) Randomized Controlled Trial
4. All the following are true about case - control studies except:
 - (a) Both exposure and outcome has occurred before start of the study
 - (b) Study progresses backwards from outcome to exposure
 - (c) Uses control group for testing hypotheses
 - (d) Loss to follow up (attrition) is the main disadvantage
5. Health workers going into the community in search of cases is an example of
 - (a) Sentinel surveillance
 - (b) Passive surveillance
 - (c) Mass surveillance
 - (d) Active surveillance
6. The association between low birth weight and maternal smoking during pregnancy can be studied by obtaining smoking history from women at the time of the first prenatal visit and then subsequently assessing and assigning birth weight at delivery according to smoking histories. What type of study is this?
 - a) Clinical trial
 - b) Cross-sectional
 - c) Prospective cohort
 - d) Case-control
 - e) Retrospective cohort
7. Which of the following measures is used frequently as a denominator to calculate the incidence rate of a disease?
 - (a) Number of cases observed
 - (b) Number of new cases observed
 - (c) Number of asymptomatic cases
 - (d) Person-years of observation
 - (e) Persons lost to follow-up
8. In the study of the causality of a disease, the essential difference between an experimental study and an observational study is, that, in the experimental investigation:
 - (a) The study is prospective
 - (b) The study is retrospective

- (c) The study and control groups are of equal size
 - (d) The investigators determine who is and who is not exposed to the suspected causal factor
 - (e) The study and control groups are selected on the basis of history of exposure to the suspected causal factor
9. Strength of association is measured by
- a) Relative risk
 - b) Odds ratio
 - c) Incidence rate
 - d) Both (a) and (b)
10. If a disease simultaneously affects persons of several countries or continents and affects them in numbers in clear excess of normalcy, the disease is said to be:
- a) Endemic
 - b) Epidemic
 - c) Pandemic
 - d) Zoonotic
11. Cause effect relationship can be tested by the following study designs except:
- a) Ecological study
 - b) Case-control study
 - c) Cohort study
 - d) Randomized Controlled Trial
12. The incidence rate of lung cancer is 120/100,000 person-years for smokers and 10/100,000 person years for nonsmokers. What is the relative risk of developing lung cancer
- a) 5
 - b) 12
 - c) 50
 - d) 100
 - e) 120
13. All the following are true about case-control studies except:
- a) Both exposure and outcome has occurred before start of the study
 - b) Study progresses backwards from outcome to exposure
 - c) Uses control group for testing hypotheses
 - d) Loss to follow up (attrition) is the main disadvantage
14. What is the appropriate way to interpret the following 95% confidence interval-case-fatality rate = 43%; 95% confidence interval = (29%, 57%)
- a) There is a 5% chance that the true case-fatality rate is between 29% and 57%
 - b) We are 95% confident that the true case-fatality rate is 43%.
 - c) We are 95% confident that the true case-fatality rate ranges from 29% to 57%.
 - d) None of the above

Q 15. A total of 360 patients participated in a randomised controlled trial designed to compare the effectiveness of drug X in reducing deaths with a placebo. Out of 120 patients in the treatment group, 12 patients died within three years. Out of 240 patients in the control group, 48 patients died within three years. The following measures for the risk of death within three years (correct to the nearest 1 decimal place) are true:

- (a) The event rate in the control group is 0.3
- (b) The event rate in the treatment group is 0.1
- (c) The relative risk reduction is 67% (to the nearest %)
- (d) The number needed to treat to prevent 1 death is 10





Time – 2.30 Hours

MM-50

Note : Please read carefully the instructions below

1. This paper has two sections A and B.
2. The question paper contains 2 sections. **Section A** is of 20 marks and **Section B** of 50 marks.
3. Any kind of overwriting and changing answers will amount to Zero marks.
4. Section A has to be solved and returned to the invigilator within first 30 mins.

The question paper contains 6 printed page.

Section- B

Q. 1. The information given below from a year long follow up study of pregnant mother until live births.

	values	Names (disease or exposure)
Number of mothers, total (N)	10,000	
Proportion with disease in total	5.0 %	low birth weight
Proportion exposed of total	25.0 %	organic food consumption
Proportion of disease among those who are not exposed	10.0%	

- a) Identify the study design (2 marks)
- b) Write down two advantages of this study design. (4 marks)
- c) Write two types of biases in this study design with appropriate examples (4 marks)

Or

Q1. Discuss the steps in investigation of hospital acquired infection outbreak. (10 marks)

Q2. The data below is from a new screening test for Lung cancer

Result of screening test	Persons having colon cancer	Persons not having colon cancer
Positive	140	950
Negative	40	62000

- a) Calculate sensitivity, specificity, positive and negative predictive value of the screening test. (8 marks)
- b) Write difference between sensitivity and positive predictive value of screening test. (2 marks)

Q 3. There was an outbreak of Bloody diahorrea in a state of India. As part of the investigation of this outbreak, IDSP workers checked the food histories of 50 patients with bloody diahorrea and compared them with the food histories of 50 patients without the disease

- a) Identify the study design? (2 marks)
- b) Write down two dis- advantages of this study design? (4 marks)
- c) Write down two types of bias in this study design with appropriate example (4 marks)

Q 4. A study was done to determine the association between silica exposure during coal mining and Tuberculosis. Occupational Health records from the year 1978 to 2018 were used to ascertain the occurrence of Tuberculosis. It was found that number of cases of Tuberculosis among the exposed were 20 out of 2500 persons followed up. In the comparison group 7 cases of lung cancer occurred out of 2500 persons followed up. Answer the questions below based on above description.

A. Identify the study design used in description given above and give reason in support of your answer

(2 marks)

B. write the difference between the study design in description given above and case control study.

(2.5 marks)

C. Draw 2x2 table based on the data given above

(2.5 marks)

D. Calculate appropriate measure of association and interpret your answer. (3 marks)

Q 5. A study was done to determine the association between indoor air pollution and cardiovascular disease among household residents. It was found that number of cases of cardiovascular disease among the exposed were 25 out of 10000 children residents followed up. In the comparison group 5 cases of cardiovascular disease occurred out of 10000 persons followed up. Answer the questions below based on above description.

A. Identify the study design used in description given above and give reason in support of your answer

(2 marks)

B. Write two advantages of a follow up study.

(1 marks)

C. Draw 2x2 table based on the data given above

(2 marks)

D. Calculate appropriate measure of association and interpret your answer.

(3 marks)

E. What are the type of bias that can occur in Cohort study? Explain one of them with appropriate example

(2 marks)

