

Institute of Health Management Research

MBA Hospital and Health Management

Batch-21st (2016-2018)

Health Management

Applied Epidemiology

Term Examination, 18 August 2017



Time - 3 Hours

MM-70

Note:

1. The question paper contains 12 pages and 50 questions.
2. All questions are compulsory
3. All questions have equal marks.
4. In MCQs and True/False, encircle the answer.
5. Any overwriting in MCQs and True/False will be credited as zero marks.
6. Hand over copy to the invigilator in the end of exam.

Roll No _____ (in words) _____

Signature of the Invigilator _____

Total Marks Marks Obtained

Signature of Examiner _____



1-4. Match the following:

A	John Snow	1	Edward Jenner	
B	Ignaz Semmelweis	2	Definition of Epidemiology	
C	Small Pox vaccine	3	Puerperal Sepsis in Maternal Deaths	
D	Last	4	Cholera Outbreak 1854	

5-8. Match the following:

A	Accident	1	Disease	
B	Loss of anatomical organ (lower leg)	2	Disability	
C	Unable to walk	3	Impairment	
D	Unable to earn livelihood	4	Handicap	

9. Education and motivation for healthy lifestyle is:

- Primordial prevention
- Secondary prevention
- Health Promotion
- Specific Protection

(.....)

10. In one of the studies, smokers and non - smokers, not having lung cancer, were followed up for 15 years and observed for the development of lung cancer. The data is set out in the following table. Calculate **EITHER** risk ratio **OR** risk difference.

Cigarette Smoking	Developed Lung CA	Did Not Develop Lung CA	Total
Smokers	70	6930	7000
Non Smokers	3	2997	3000
Total	73	9927	10000

11. Which of the following is not an essential characteristic of a confounding variable:

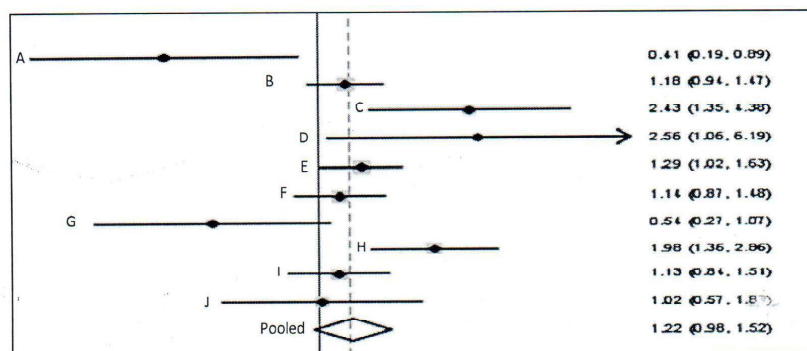
- It should lie in the direct chain of causation between exposure and the outcome variable
- It should be related to the exposure variable
- It should be related to the outcome variable, independent of it's relationship with the exposure variable
- it should be differentially distributed.

(.....)

Paper Code - A

Questions 12-13

A Meta-analysis to explore association between alcohol drinking and gastric cancer risk was conducted based on PubMed search of articles published up to June 2010 and identified 10 Case-Control studies. (Tramacere I. 2011). Crude Odds Ratios from these studies are presented in the figure below.



12. Which of the following statement is correct?

- Conclusion that Alcohol drinking is associated with increased risk of gastric cancer
- Conclusion that Alcohol drinking is NOT associated with increased risk of gastric cancer as overall pooled Odds Ratio is not significant.
- Conclusions that there is an increased risk since some of the studies have shown Odds Ratio more than 1.
- No conclusion can be drawn

(.....)

13. Some case-control studies showed negative and positive association between the Risk of gastric cancer with alcohol use. This might have happened because of:

- Sampling error and sample size
- Selection bias resulting from selection of prevalent or incident cases
- Information bias due to inappropriate measurement of exposure (alcohol)
- All above

(.....)

14. Interpret the following values for an odds ratio (OR) in terms of OCP use and breast cancer:

OR = 1.0; OR = 0.5; OR = 2.0

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Paper Code - A

Q 15-22. Please read this summary of a study on **Human Papilloma Virus and Cervix Cancer**, and answer the questions.

The association between human papillomavirus (HPV) and cervix cancer was studied. 103 women with cervical cancer were identified in two gynaecological hospitals. 234 age matched controls were randomly selected from a population registry. All subjects were interviewed about their sexual history and smoking history. All women were tested for presence of HPV. HPV DNA was detected in 34/221 (15.4%) of controls and in 89/98 (90.8%) of cases. The association between cervical cancer and the independent variables are shown below. The table provides crude odds ratios and adjusted odds ratios from logistic regression. 95% confidence intervals are given for both measures. (There is a significant association if the confidence interval does not contain the "null value")

Variable	Crude		Adjusted	
	Odds Ratio	Confidence interval	Odds Ratio	Confidence interval
HPV				
neg	1.0		1.0	
pos	68.0	(28.2 - 164.4)	73.7	(27.7 - 196.4)
Smoking history				
never	1.0		1.0	
ever	4.1	(2.3 - 7.3)	1.5	(0.5 - 4.8)
Number of partners				
1-3	1.0		1.0	
4-9	5.5	(2.5 - 12.0)	1.9	(0.6 - 6.2)
10+	8.2	(3.7 - 17.9)	5.2	(1.4 - 19.4)
Oral contraceptive use				
never	1.0		1.0	
ever	1.6	(0.8 - 3.3)	1.4	(0.5 - 3.8)
Parity				
Null	1.0		1.0	
1+	0.5	(0.4 - 0.8)	1.8	(0.7 - 4.9)

15. What is the objective (purpose) of this study?

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16. What type of design is this? How many subjects are included?

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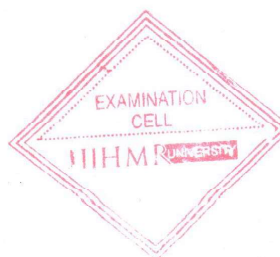
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17. What is the outcome ("disease")? What type of frequency (disease occurrence) measure is used?

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Paper Code - A



18. What is the main exposure (or exposures)? What type of association measure is used? Could others have been calculated?

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19. Explain the main results in words (table).

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20. Discuss the possible bias in this study?

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21. Comparing crude and adjusted, is there evidence of confounding for any of the variables?

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22. Can we, based on the table, tell which variable is causing the confounding effect?

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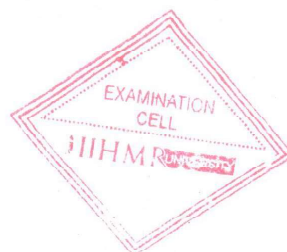
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Questions 23-25. Refer to the following information:

In a cohort study of smoking and lung cancer, the incidence of lung cancer among smokers was found to be 9/1,000 and the incidence among nonsmokers was 1/1,000. From another source we know that 45% of the total population were smokers.

23. Prepare a 2x2 table

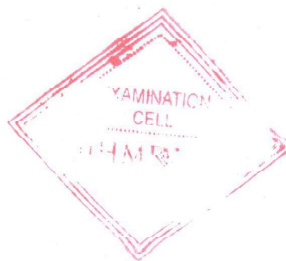
Paper Code - A



24. The incidence of lung cancer attributable to smoking in the total population is: _____

25. The proportion of the risk in the total population that is attributable to smoking is: _____

26. All are types of descriptive studies EXCEPT
 a. Case Reports
 b. Ecologic Studies
 c. Cohort Studies
 d. Cross Sectional Studies (.....)
27. A Cross-sectional study that includes the entire population is referred to as a
 a. Cohort Study
 b. Longitudinal Study
 c. Public opinion poll
 d. Census (.....)
28. Which domain of the "policy" is directly related to epidemiology?
 a. Values
 b. Ideology
 c. Evidence
 d. Politics (.....)
29. Which of the following is *not* an advantage of a prospective cohort study?
 a. It usually costs less than a case-control study
 b. Precise measurement of exposure is possible
 c. Incidence rates can be calculated
 d. Recall bias is minimized compared with a case-control study
 e. Many disease outcomes can be studied simultaneously (.....)
30. Which of the following health statistics would be most useful in selecting risk factors to target for intervention in order to have the greatest health impact, assuming that the planned interventions are equally effective but resources are limited?
 a. Incidence Rate.
 b. Attributable Risk
 c. Prevalence Rate.
 d. Relative risk of the disease (.....)



Question 31-32 are based on the following:

A cohort study reported that not eating fish had increased the risk for stroke. The table below shows the results of this study:

Eating Fish & Stroke			
Eating fish	Stroke present	Stroke absent	Total
Never	82	1549	1631
Almost daily	23	779	802
Total	105	2328	2433

31. Attributable risk percent of the stroke due to non-eating of fish is:

- a. 4.3%
- b. 1.45%
- c. 2.2%
- d. 1.75%

(.....)

32. Population attributable risk (percent) of the stroke due to non-eating of fish is:

- a. 4.3%
- b. 1.45%
- c. 2.2%
- d. 1.75%

(.....)

Question 33-38. Identify the study designs from each of the following narratives:

33. Cases of viral hepatitis are monitored by the District Health Officer in his district. Each case of viral hepatitis is indicated by a dot on the map of the district. He also records the seasonal variations annually by monitoring the number of cases each month. He classifies the cases according to age, gender, occupation, source of water supply and other personal attributes.

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34. Two groups of teenagers were identified, one who were given education on safe driving by their parents or school teachers and the second who did not receive such education. The outcome measure which was compared was the rate of involvement in both fatal and non-fatal traffic accidents in the two groups over the next 10 years.

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Paper Code - A



35. To test the hypotheses that children of separated parents are more likely to become drug addicts, cases of drug addiction were identified from a de-addiction centre. They were compared with people without drug addiction, who were matched for age, sex, literacy and socioeconomic status with cases of drug addiction. The history of separation of parents was obtained from both cases and controls and cross checked from records.
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36. Using two masked pieces of paper, one labelled study group and the other control group, each participant in a study is offered to pick up one chit and replace it after he is allotted the group according to the chit he picked up. After this method of going either into study and control group, the participants in the study group are given Deltamethrin (an insecticide) impregnated mosquito nets, to use during night time, while the control group is given ordinary mosquito nets. The outcome measured is incidence of malaria in the two groups.
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37. A survey among under-five children is carried out in five selected villages to find out malnutrition among them and the factors associated with various grades of malnutrition. In one of the studies, smokers and non-smokers, not having lung cancer, were followed up for 15 years and observed for the development of lung cancer. The data is set out in a table; and the various measures of risk ratio and risk difference were calculated.
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38. If OR is a more approximate to RR for a disease, in case of:
(a) High incidence of disease
(b) Low incidence of exposure
(c) Very low incidence of disease
(d) None of the above. (.....)
39. The ability of a measurement process to diagnose correctly as positive those who really have the disease and correctly negative those who really have not the disease, is called as
(a) sensitivity (b) specificity (c) precision (d) validity (.....)
40. Some case-control studies showed negative and positive association between the Risk of gastric cancer with alcohol use. This might have happened because of:
a. Sampling error and sample size
b. Selection bias resulting from selection of prevalent or incident cases
c. Information bias due to inappropriate measurement of exposure (alcohol)
d. All above (.....)

Paper Code - A



Please indicate whether these statements are True (T) or False (F). Encircle the one Right answer.

41. T/ F In Cross sectional analytic study each subject is examined more than once.
42. T/ F Person years of treatment may be used as denominator to measure treatment effectiveness.
43. 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.
44. T/ F In cross sectional analytic study exposure and outcome are measured in subjects simultaneously.
45. T/ F Relative Risk and Odds Ratio are measures of risk to determine the cause and effect relationship.

46. Describe a scenario of rates of mortality and morbidity where the incidence of a disease becomes equal the prevalence.

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Q. 47- 50

The following results were obtained in an occupational cohort study of the risk of cancer associated with exposure to radiation.

Radiation dose (rem)	Total size of the cohort at baseline	New cancer cases	Cumulative cancer incidence	Relative risk (RR)	Odds ratio (OR) (comparing cases to noncases)
0.0 - 0.99	3642	390			
1.0 - 4.99	1504	181			
5+	1320	222			
*Assume no losses to follow up.					

47. Fill in the empty cells in this table. For the calculation of the RR and OR, use the lowest radiation dose category as the reference category.

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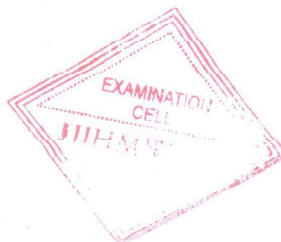
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Paper Code - A



48. How do you explain the difference or similarity between OR and corresponding RR calculated here?

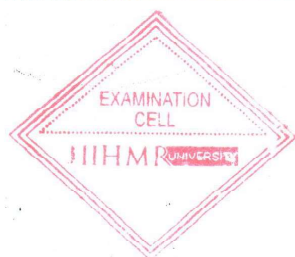
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49. Assuming that an association between exposure and disease is actually present, which of the following statements is true?

- a. The odds ratio is always smaller in absolute value than the relative risk.
- b. The odds ratio is always bigger in absolute value than the relative risk.
- c. The odds ratio is always closer to 1 than the relative risk.
- d. The odds ratio is always farthest away from 1 than the relative risk. (.....)

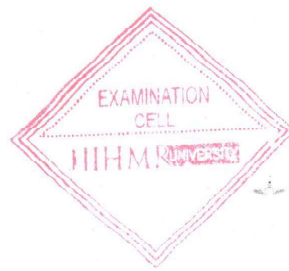
50. Progressively higher relative risks (or Odds ratio) with increasing tradition dose are observed. Which traditional causality criterion is met when progressively higher relative risks (odds ratios) observed?

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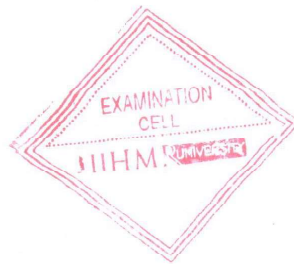


Rough Work

Paper Code - A

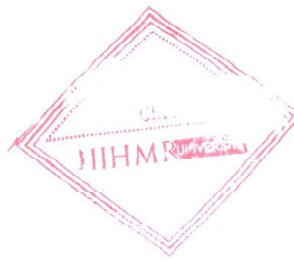


Paper Code - A



Rough Work

Paper Code - A



Paper Code - A



Time - 3 Hours

MM-70

Note:

1. The question paper contains 12 pages and 50 questions.
2. All questions are compulsory
3. All questions have equal marks.
4. In MCQs and True/False, encircle the answer.
5. Any overwriting in MCQs and True/False will be credited as zero marks.
6. Hand over copy to the invigilator in the end of exam.

Roll No . _____ (in words) _____

Signature of the Invigilator _____

Total Marks Marks Obtained

Signature of Examiner _____

Question 1-8.

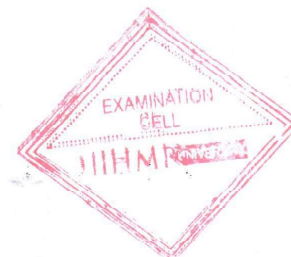
Please read this summary of a study on **Human Papilloma Virus and Cervix Cancer**, and answer the questions.

The association between human papillomavirus (HPV) and cervix cancer was studied. 103 women with cervical cancer were identified in two gynaecological hospitals. 234 age matched controls were randomly selected from a population registry. All subjects were interviewed about their sexual history and smoking history. All women were tested for presence of HPV. HPV DNA was detected in 34/221 (15.4%) of controls and in 89/98 (90.8%) of cases. The association between cervical cancer and the independent variables are shown below. The table provides crude odds ratios and adjusted odds ratios from logistic regression. 95% confidence intervals are given for both measures. (There is a significant association if the confidence interval does not contain the "null value")

Variable	Crude		Adjusted	
	Odds Ratio	Confidence interval	Odds Ratio	Confidence interval
HPV				
neg	1.0		1.0	
pos	68.0	(28.2 - 164.4)	73.7	(27.7 - 196.4)
Smoking history				
never	1.0		1.0	
ever	4.1	(2.3 - 7.3)	1.5	(0.5 - 4.8)
Number of partners				
1-3	1.0		1.0	
4-9	5.5	(2.5 - 12.0)	1.9	(0.6 - 6.2)
10+	8.2	(3.7 - 17.9)	5.2	(1.4 - 19.4)
Oral contraceptive use				
never	1.0		1.0	
ever	1.6	(0.8 - 3.3)	1.4	(0.5 - 3.8)
Parity				
Null	1.0		1.0	
1+	0.5	(0.4 - 0.8)	1.8	(0.7 - 4.9)

- What is the objective (purpose) of this study?
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- What type of design is this? How many subjects are included?
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- What is the outcome ("disease")? What type of frequency (disease occurrence) measure is used?
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Paper Code - D



4. What is the main exposure (or exposures)? What type of association measure is used? Could others have been calculated?

5. Explain the main results in words (table).

6. Discuss the possible bias in this study?

7. Comparing crude and adjusted, is there evidence of confounding for any of the variables?

8. Can we, based on the table, tell which variable is causing the confounding effect?

Questions 9-11. Refer to the following information:

In a cohort study of smoking and lung cancer, the incidence of lung cancer among smokers was found to be 9/1,000 and the incidence among nonsmokers was 1/1,000. From another source we know that 45% of the total population were smokers.

9. Prepare a 2x2 table

Paper Code - D

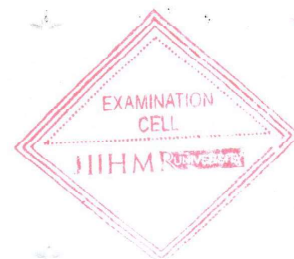


10. The incidence of lung cancer attributable to smoking in the total population is: _____

11. The proportion of the risk in the total population that is attributable to smoking is: _____

12. All are types of descriptive studies EXCEPT
 a. Case Reports
 b. Ecologic Studies
 c. Cohort Studies
 d. Cross Sectional Studies (.....)
13. A Cross-sectional study that includes the entire population is referred to as a
 a. Cohort Study
 b. Longitudinal Study
 c. Public opinion poll
 d. Census (.....)
14. Which domain of the "policy" is directly related to epidemiology?
 a. Values
 b. Ideology
 c. Evidence
 d. Politics (.....)
15. Which of the following is *not* an advantage of a prospective cohort study?
 a. It usually costs less than a case-control study
 b. Precise measurement of exposure is possible
 c. Incidence rates can be calculated
 d. Recall bias is minimized compared with a case-control study
 e. Many disease outcomes can be studied simultaneously (.....)
16. Which of the following health statistics would be most useful in selecting risk factors to target for intervention in order to have the greatest health impact, assuming that the planned interventions are equally effective but resources are limited?
 a. Incidence Rate.
 b. Attributable Risk
 c. Prevalence Rate.
 d. Relative risk of the disease (.....)

Paper Code - D



Question 17-18 are based on the following:

A cohort study reported that not eating fish had increased the risk for stroke. The table below shows the results of this study:

Eating Fish & Stroke			
Eating fish	Stroke present	Stroke absent	Total
Never	82	1549	1631
Almost daily	23	779	802
Total	105	2328	2433

17. Attributable risk percent of the stroke due to non-eating of fish is:

- a. 4.3%
- b. 1.45%
- c. 2.2%
- d. 1.75%

(.....)

18. Population attributable risk (percent) of the stroke due to non-eating of fish is:

- a. 4.3%
- b. 1.45%
- c. 2.2%
- d. 1.75%

(.....)

Question 19-23. Identify the study designs from each of the following narratives:

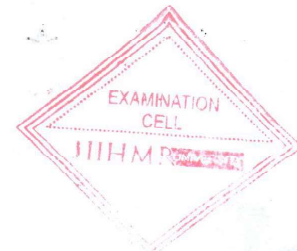
19. Cases of viral hepatitis are monitored by the District Health Officer in his district. Each case of viral hepatitis is indicated by a dot on the map of the district. He also records the seasonal variations annually by monitoring the number of cases each month. He classifies the cases according to age, gender, occupation, source of water supply and other personal attributes.

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20. Two groups of teenagers were identified, one who were given education on safe driving by their parents or school teachers and the second who did not receive such education. The outcome measure which was compared was the rate of involvement in both fatal and non-fatal traffic accidents in the two groups over the next 10 years.

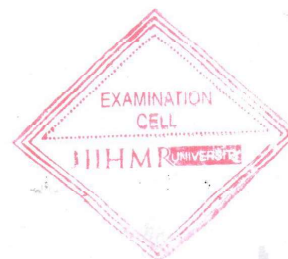
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Paper Code - D



21. To test the hypotheses that children of separated parents are more likely to become drug addicts, cases of drug addiction were identified from a de-addiction centre. They were compared with people without drug addiction, who were matched for age, sex, literacy and socioeconomic status with cases of drug addiction. The history of separation of parents was obtained from both cases and controls and cross checked from records.
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22. Using two masked pieces of paper, one labelled study group and the other control group, each participant in a study is offered to pick up one chit and replace it after he is allotted the group according to the chit he picked up. After this method of going either into study and control group, the participants in the study group are given Deltamethrin (an insecticide) impregnated mosquito nets, to use during night time, while the control group is given ordinary mosquito nets. The outcome measured is incidence of malaria in the two groups.
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23. A survey among under-five children is carried out in five selected villages to find out malnutrition among them and the factors associated with various grades of malnutrition. In one of the studies, smokers and non-smokers, not having lung cancer, were followed up for 15 years and observed for the development of lung cancer. The data is set out in a table; and the various measures of risk ratio and risk difference were calculated.
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24. If OR is a more approximate to RR for a disease, in case of:
(a) High incidence of disease
(b) Low incidence of exposure
(c) Very low incidence of disease
(d) None of the above. (.....)
25. The ability of a measurement process to diagnose correctly as positive those who really have the disease and correctly negative those who really have not the disease, is called as
(a) sensitivity (b) specificity (c) precision (d) validity (.....)
26. Some case-control studies showed negative and positive association between the Risk of gastric cancer with alcohol use. This might have happened because of:
a. Sampling error and sample size
b. Selection bias resulting from selection of prevalent or incident cases
c. Information bias due to inappropriate measurement of exposure (alcohol)
d. All above (.....)

Paper Code - D



Please indicate whether these statements are True (T) or False (F). Encircle the one Right answer.

27. T/ F In Cross sectional analytic study each subject is examined more than once.
28. T/ F Person years of treatment may be used as denominator to measure treatment effectiveness.
29. 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.
30. T/ F In cross sectional analytic study exposure and outcome are measured in subjects simultaneously.
31. T/ F Relative Risk and Odds Ratio are measures of risk to determine the cause and effect relationship.

32. Describe a scenario of rates of mortality and morbidity where the incidence of a disease becomes equal the prevalence.

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Q. 33- 35

The following results were obtained in an occupational cohort study of the risk of cancer associated with exposure to radiation.

Radiation dose (rem)	Total size of the cohort at baseline	New cancer cases	Cumulative cancer incidence	Relative risk (RR)	Odds ratio (OR) (comparing cases to noncases)
0.0 - 0.99	3642	390			
1.0 - 4.99	1504	181			
5+	1320	222			
*Assume no losses to follow up.					

33. Fill in the empty cells in this table. For the calculation of the RR and OR, use the lowest radiation dose category as the reference category.

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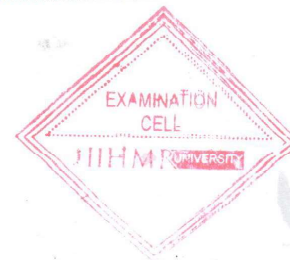
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Paper Code - D



34. How do you explain the difference or similarity between OR and corresponding RR calculated here?

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35. Assuming that an association between exposure and disease is actually present, which of the following statements is true?

- The odds ratio is always smaller in absolute value than the relative risk.
- The odds ratio is always bigger in absolute value than the relative risk.
- The odds ratio is always closer to 1 than the relative risk.
- The odds ratio is always farthest away from 1 than the relative risk. (.....)

36. Progressively higher relative risks (or Odds ratio) with increasing radiation dose are observed. Which traditional causality criterion is met when progressively higher relative risks (odds ratios) observed?

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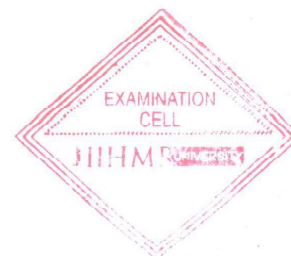
Q. 37-40. Match the following:

A	John Snow	1	Edward Jenner	
B	Ignaz Semmelweis	2	Definition of Epidemiology	
C	Small Pox vaccine	3	Puerperal Sepsis in Maternal Deaths	
D	Last	4	Cholera Outbreak 1854	

Q. 41-44. Match the following:

A	Accident	1	Disease	
B	Loss of anatomical organ (lower leg)	2	Disability	
C	Unable to walk	3	Impairment	
D	Unable to earn livelihood	4	Handicap	

Paper Code - D



45. Education and motivation for healthy lifestyle is:

- a. Primordial prevention
- b. Secondary prevention
- c. Health Promotion
- d. Specific Protection

(.....)

46. In one of the studies, smokers and non - smokers, not having lung cancer, were followed up for 15 years and observed for the development of lung cancer. The data is set out in the following table. Calculate **EITHER** risk ratio **OR** risk difference.

Cigarette Smoking	Developed Lung CA	Did Not Develop Lung CA	Total
Smokers	70	6930	7000
Non Smokers	3	2997	3000
Total	73	9927	10000

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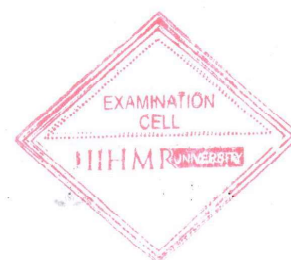
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47. Which of the following is not an essential characteristic of a confounding variable:

- (a) It should lie in the direct chain of causation between exposure and the outcome variable
- (b) It should be related to the exposure variable
- (c) It should be related to the outcome variable, independent of it's relationship with the exposure variable
- (d) it should be differentially distributed.

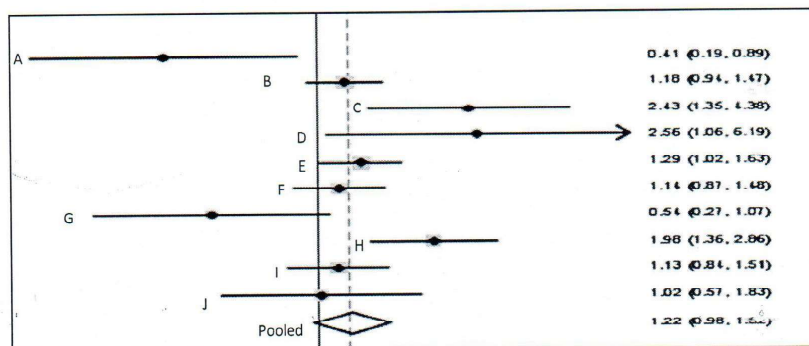
(.....)



Paper Code - D

Questions 48-49.

A Meta-analysis to explore association between alcohol drinking and gastric cancer risk was conducted based on PubMed search of articles published up to June 2010 and identified 10 Case-Control studies. (Tramacere I. 2011). Crude Odds Ratios from these studies are presented in the figure below.



48. Which of the following statement is correct?

- Conclusion that Alcohol drinking is associated with increased risk of gastric cancer
- Conclusion that Alcohol drinking is NOT associated with increased risk of gastric cancer as overall pooled Odd Ratio is not significant.
- Conclusions that there is an increased risk since some of the studies have shown Odd Ratio more than 1.
- No conclusion can be drawn

(.....)

49. Some case-control studies showed negative and positive association between the Risk of gastric cancer with alcohol use. This might have happened because of:

- Sampling error and sample size
- Selection bias resulting from selection of prevalent or incident cases
- Information bias due to inappropriate measurement of exposure (alcohol)
- All above

(.....)

50. Interpret the following values for an odds ratio (OR) in terms of OCP use and breast cancer:

OR = 1.0; OR = 0.5; OR = 2.0

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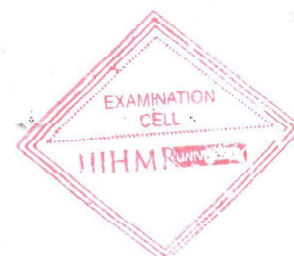
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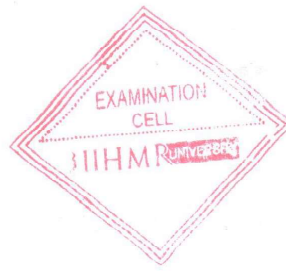
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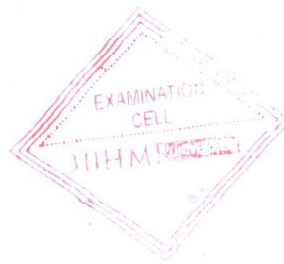


Rough Work



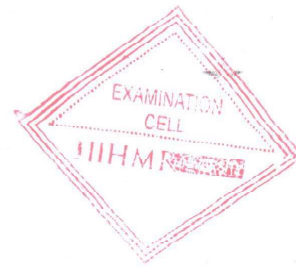
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Paper Code - D



Rough Work

Paper Code - D



Paper Code - D



IHHMR UNIVERSITY

Institute of Health Management Research

MBA Hospital and Health Management

Batch-21st (2016-2018)

Health Management

Applied Epidemiology

Term Examination, 18 August 2017

Time - 3 Hours

MM-70

Note:

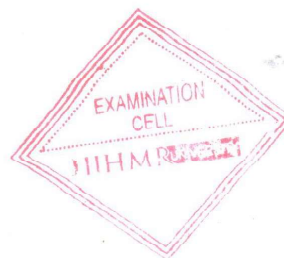
1. The question paper contains 12 pages and 50 questions.
2. All questions are compulsory
3. All questions have equal marks.
4. In MCQs and True/False, encircle the answer.
5. Any overwriting in MCQs and True/False will be credited as zero marks.
6. Hand over copy to the invigilator in the end of exam.

Roll No . _____ (in words) _____

Signature of the Invigilator _____

Total Marks Marks Obtained

Signature of Examiner _____



1. All are types of descriptive studies EXCEPT
 - a. Case Reports
 - b. Ecologic Studies
 - c. Cohort Studies
 - d. Cross Sectional Studies
 (.....)
2. A Cross-sectional study that includes the entire population is referred to as a
 - a. Cohort Study
 - b. Longitudinal Study
 - c. Public opinion poll
 - d. Census
 (.....)
3. Which domain of the "policy" is directly related to epidemiology?
 - a. Values
 - b. Ideology
 - c. Evidence
 - d. Politics
 (.....)
4. Which of the following is *not* an advantage of a prospective cohort study?
 - a. It usually costs less than a case-control study
 - b. Precise measurement of exposure is possible
 - c. Incidence rates can be calculated
 - d. Recall bias is minimized compared with a case-control study
 - e. Many disease outcomes can be studied simultaneously
 (.....)
5. Which of the following health statistics would be most useful in selecting risk factors to target for intervention in order to have the greatest health impact, assuming that the planned interventions are equally effective but resources are limited?
 - a. Incidence Rate.
 - b. Attributable Risk
 - c. Prevalence Rate.
 - d. Relative risk of the disease
 (.....)

Question 6-7 are based on the following:

A cohort study reported that not eating fish had increased the risk for stroke. The table below shows the results of this study:

Eating Fish & Stroke			
Eating fish	Stroke present	Stroke absent	Total
Never	82	1549	1631
Almost daily	23	779	802
Total	105	2328	2433

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6. Attributable risk percent of the stroke due to non-eating of fish is:

- a. 4.3%
- b. 1.45%
- c. 2.2%
- d. 1.75%

(.....)

7. Population attributable risk (percent) of the stroke due to non-eating of fish is:

- a. 4.3%
- b. 1.45%
- c. 2.2%
- d. 1.75%

(.....)

Question 8-12. Identify the study designs from each of the following narratives:

8. Cases of viral hepatitis are monitored by the District Health Officer in his district. Each case of viral hepatitis is indicated by a dot on the map of the district. He also records the seasonal variations annually by monitoring the number of cases each month. He classifies the cases according to age, gender, occupation, source of water supply and other personal attributes.

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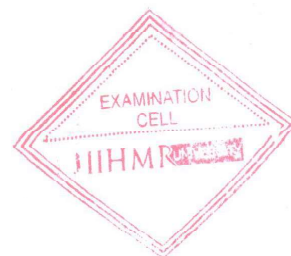
9. Two groups of teenagers were identified, one who were given education on safe driving by their parents or school teachers and the second who did not receive such education. The outcome measure which was compared was the rate of involvement in both fatal and non - fatal traffic accidents in the two groups over the next 10 years.

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10. To test the hypotheses that children of separated parents are more likely to become drug addicts, cases of drug addiction were identified from a de - addiction centre. They were compared with people without drug addiction, who were matched for age, sex, literacy and socioeconomic status with cases of drug addiction. The history of separation of parents was obtained from both cases and controls and cross checked from records.

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Paper Code - I

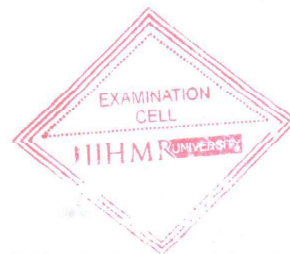


11. Using two masked pieces of paper, one labelled study group and the other control group, each participant in a study is offered to pick up one chit and replace it after he is allotted the group according to the chit he picked up. After this method of going either into study and control group, the participants in the study group are given Deltamethrin (an insecticide) impregnated mosquito nets, to use during night time, while the control group is given ordinary mosquito nets. The outcome measured is incidence of malaria in the two groups.
.....
12. A survey among under - five children is carried out in five selected villages to find out malnutrition among them and the factors associated with various grades of malnutrition. In one of the studies, smokers and non - smokers, not having lung cancer, were followed up for 15 years and observed for the development of lung cancer. The data is set out in a table; and the various measures of risk ratio and risk difference were calculated.
.....
13. If OR is a more approximate to RR for a disease, in case of:
(a) High incidence of disease
(b) Low incidence of exposure
(c) Very low incidence of disease
(d) None of the above. (.....)
14. The ability of a measurement process to diagnose correctly as positive those who really have the disease and correctly negative those who really have not the disease, is called as
(a) sensitivity (b) specificity (c) precision (d) validity (.....)
15. Some case-control studies showed negative and positive association between the Risk of gastric cancer with alcohol use. This might have happened because of:
a. Sampling error and sample size
b. Selection bias resulting from selection of prevalent or incident cases
c. Information bias due to inappropriate measurement of exposure (alcohol)
d. All above (.....)

Please indicate whether these statements are True (T) or False (F). Encircle the one Right answer.

16. T/ F In Cross sectional analytic study each subject is examined more than once.
17. T/ F Person years of treatment may be used as denominator to measure treatment effectiveness.
18. 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.
19. T/ F In cross sectional analytic study exposure and outcome are measured in subjects simultaneously.
20. T/ F Relative Risk and Odds Ratio are measures of risk to determine the cause and effect relationship.

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21. Describe a scenario of rates of mortality and morbidity where the incidence of a disease becomes equal the prevalence.

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Q. 22- 25

The following results were obtained in an occupational cohort study of the risk of cancer associated with exposure to radiation.

Radiation dose (rem)	Total size of the cohort at baseline	New cancer cases	Cumulative cancer incidence	Relative risk (RR)	Odds ratio (OR) (comparing cases to noncases)
0.0 - 0.99	3642	390			
1.0 - 4.99	1504	181			
5+	1320	222			

*Assume no losses to follow up.

22. Fill in the empty cells in this table. For the calculation of the RR and OR, use the lowest radiation dose category as the reference category.

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23. How do you explain the difference or similarity between OR and corresponding RR calculated here?

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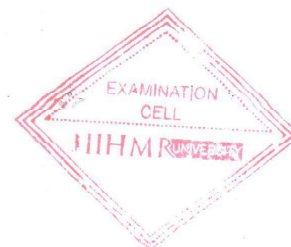
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24. Assuming that an association between exposure and disease is actually present, which of the following statements is true?

- The odds ratio is always smaller in absolute value than the relative risk.
- The odds ratio is always bigger in absolute value than the relative risk.
- The odds ratio is always closer to 1 than the relative risk.
- The odds ratio is always farthest away from 1 than the relative risk. (.....)

Paper Code - I



25. Progressively higher relative risks (or Odds ratio) with increasing radiation dose are observed. Which traditional causality criterion is met when progressively higher relative risks (odds ratios) observed?

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Q. 26-29. Match the following:

A	John Snow	1	Edward Jenner	
B	Ignaz Semmelweis	2	Definition of Epidemiology	
C	Small Pox vaccine	3	Puerperal Sepsis in Maternal Deaths	
D	Last	4	Cholera Outbreak 1854	

Q. 30-33. Match the following:

A	Accident	1	Disease	
B	Loss of anatomical organ (lower leg)	2	Disability	
C	Unable to walk	3	Impairment	
D	Unable to earn livelihood	4	Handicap	

34. Education and motivation for healthy lifestyle is:

- Primordial prevention
- Secondary prevention
- Health Promotion
- Specific Protection

(.....)

35. In one of the studies, smokers and non - smokers, not having lung cancer, were followed up for 15 years and observed for the development of lung cancer. The data is set out in the following table. Calculate **EITHER** risk ratio **OR** risk difference.

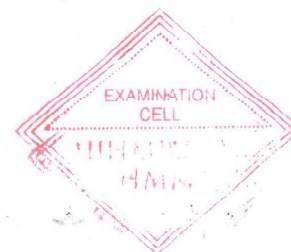
Cigarette Smoking	Developed Lung CA	Did Not Develop Lung CA	Total
Smokers	70	6930	7000
Non Smokers	3	2997	3000
Total	73	9927	10000

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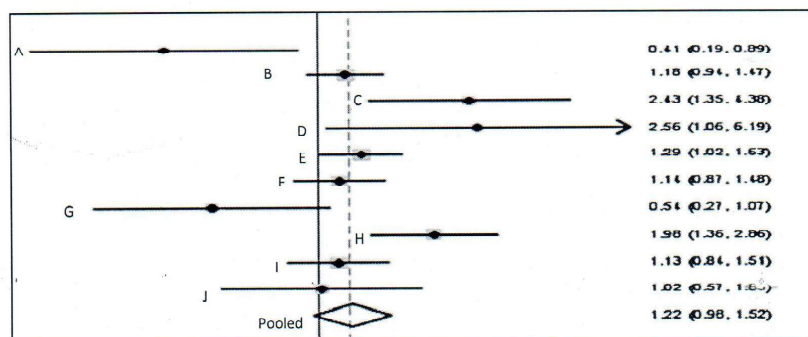
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36. Which of the following is not an essential characteristic of a confounding variable:
- It should lie in the direct chain of causation between exposure and the outcome variable
 - It should be related to the exposure variable
 - It should be related to the outcome variable, independent of its relationship with the exposure variable
 - it should be differentially distributed. (.....)

Questions 37-38.

A Meta-analysis to explore association between alcohol drinking and gastric cancer risk was conducted based on PubMed search of articles published up to June 2010 and identified 10 Case-Control studies. (Tramacere I. 2011). Crude Odds Ratios from these studies are presented in the figure below.



37. Which of the following statement is correct?
- Conclusion that Alcohol drinking is associated with increased risk of gastric cancer
 - Conclusion that Alcohol drinking is NOT associated with increased risk of gastric cancer as overall pooled Odd Ratio is not significant.
 - Conclusions that there is an increased risk since some of the studies have shown Odd Ratio more than 1.
 - No conclusion can be drawn (.....)
38. Some case-control studies showed negative and positive association between the Risk of gastric cancer with alcohol use. This might have happened because of:
- Sampling error and sample size
 - Selection bias resulting from selection of prevalent or incident cases
 - Information bias due to inappropriate measurement of exposure (alcohol)
 - All above

(.....)

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39. Interpret the following values for an odds ratio (OR) in terms of OCP use and breast cancer:

OR = 1.0; OR = 0.5; OR = 2.0

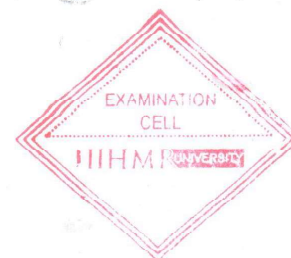
Question 40-47. Please read this summary of a study on **Human Papilloma Virus and Cervix Cancer**, and answer the questions.

The association between human papillomavirus (HPV) and cervix cancer was studied. 103 women with cervical cancer were identified in two gynaecological hospitals. 234 age matched controls were randomly selected from a population registry. All subjects were interviewed about their sexual history and smoking history. All women were tested for presence of HPV. HPV DNA was detected in 34/221 (15.4%) of controls and in 89/98 (90.8%) of cases. The association between cervical cancer and the independent variables are shown below. The table provides crude odds ratios and adjusted odds ratios from logistic regression. 95% confidence intervals are given for both measures. (There is a significant association if the confidence interval does not contain the "null value")

Variable	Crude		Adjusted	
	Odds Ratio	Confidence intervall	Odds Ratio	Confidence intervall
HPV				
neg	1.0		1.0	
pos	68.0	(28.2 - 164.4)	73.7	(27.7 - 196.4)
Smoking history				
never	1.0		1.0	
ever	4.1	(2.3 - 7.3)	1.5	(0.5 - 4.8)
Number of partners				
1-3	1.0		1.0	
4-9	5.5	(2.5 - 12.0)	1.9	(0.6 - 6.2)
10+	8.2	(3.7 - 17.9)	5.2	(1.4 - 19.4)
Oral contraceptive use				
never	1.0		1.0	
ever	1.6	(0.8 - 3.3)	1.4	(0.5 - 3.8)
Parity				
Null	1.0		1.0	
1+	0.5	(0.4 - 0.8)	1.8	(0.7 - 4.9)

40. What is the objective (purpose) of this study?

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41. What type of design is this? How many subjects are included?

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42. What is the outcome ("disease")? What type of frequency (disease occurrence) measure is used?

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43. What is the main exposure (or exposures)? What type of association measure is used? Could others have been calculated?

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44. Explain the main results in words (table).

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45. Discuss the possible bias in this study?

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46. Comparing crude and adjusted, is there evidence of confounding for any of the variables?

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47. Can we, based on the table, tell which variable is causing the confounding effect?

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Questions 48-50. Refer to the following information:

In a cohort study of smoking and lung cancer, the incidence of lung cancer among smokers was found to be 9/1,000 and the incidence among nonsmokers was 1/1,000. From another source we know that 45% of the total population were smokers.

48. Prepare a 2x2 table

49. The incidence of lung cancer attributable to smoking in the total population is: _____

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50. The proportion of the risk in the total population that is attributable to smoking is: _____

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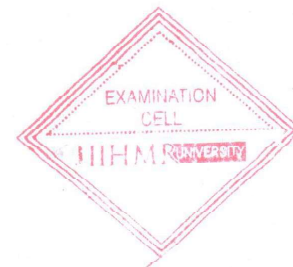
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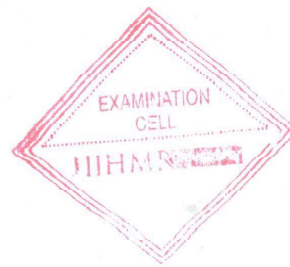
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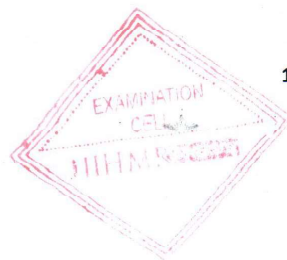


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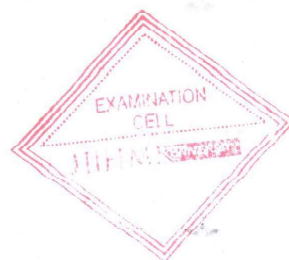


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