

**POST GRADUATE DIPLOMA IN BIOETHICS (PGDBE)**

**Term-End Examination**

**June, 2016**

**MHS-014 : RESEARCH METHODOLOGY**

*Time : 2 hours*

*Maximum Marks : 70*

**PART A**

*Attempt all questions. Write the answers in your answer sheet. Each question carries one (1) mark. Select the most appropriate choice from the given choices for each of the following questions.*

*50×1=50*

1. Which of the following is *not* true for an odds ratio ?
  - (1) Odds ratio ranges from 0 to infinity
  - (2) If odds ratio is less than one, the event is less likely to occur
  - (3) If odds ratio is greater than one, the event is more likely to occur
  - (4) Odds ratio ranges from (-) infinity to (+) infinity
  
2. Which of the following is a binomial distribution situation ?
  - (1) Number of printing mistakes in a page of a book
  - (2) Occurrence of head in the throw of a coin
  - (3) Number of red cells in one ml of blood
  - (4) Number of heads in a throw of 20 coins
  
3. In epidemiology, the mixing effect of the exposure under the study on the diseases with that of a third factor that is associated with exposure is
  - (1) Bias
  - (2) Unbias
  - (3) Confounding
  - (4) Mixing Bias

- 4. Select the odd one for a normal distribution.**
- (1) Mean = Median = Mode
  - (2) Area under standard normal curve is equal to one
  - (3) It is mesokurtic
  - (4) Area under normal curve is equal to one
- 5. Choose the measure which is based on every item of the observation.**
- (1) Range
  - (2) Quartile Deviation
  - (3) Standard Deviation
  - (4) Mode
- 6. The purpose of Phase-2 trials is to**
- (1) Find a safe dosage
  - (2) Compare the new agent or intervention
  - (3) Determine whether the agent or intervention has an effect or not
  - (4) Evaluate long-term safety and efficiency
- 7. A statistical measure based on the entire population is**
- (1) Sample parameter
  - (2) Statistics
  - (3) Estimate
  - (4) None of the above
- 8. Effect of exercising or omitting smoking is an example of**
- (1) Agent studies
  - (2) Chemoprevention studies
  - (3) Action studies
  - (4) None of the above
- 9. For computing sample size for clinical trial we need to specify the**
- (1) Significance level
  - (2) Power of the test
  - (3) Standard Deviation of clinical parameter
  - (4) All of the above

- 10.** Which of the following statements is true with regard to intention to treat analysis ?
- (1) Do not give an unbiased estimate of treatment effect
  - (2) Estimate of treatment effect is generally not conservative
  - (3) Retains balance in prognostic factor from the original allocation
  - (4) None of the above
- 11.** To increase the likelihood of obtaining significant result, we should have
- (1) Large difference between groups
  - (2) Smaller standard error
  - (3) Large sample size
  - (4) All of the above
- 12.** Interim analysis
- (1) Should always be done
  - (2) Should never be done
  - (3) Is called data dependent stopping
  - (4) None of the above
- 13.** Probability of correctly rejecting Null Hypothesis is
- (1) Alpha
  - (2) Beta
  - (3) Power
  - (4) None of the above
- 14.** Which one of the following actions will increase the power ?
- (1) Increase Alpha
  - (2) Increase Beta
  - (3) Increase Sample Size
  - (4) None of the above
- 15.** GCP in clinical trials stands for
- (1) Good Common Practice
  - (2) General Criteria for Patients
  - (3) Good Clinical Practice
  - (4) God Can Protect

- 16.** An experiment compares a new drug against a standard drug.  
The patient should be allocated to either the new drug or the standard drug
- (1) Based on the response to treatment
  - (2) Based on normality
  - (3) By Randomization
  - (4) All of the above
- 17.** Statistical test is the probability of
- (1) Acceptance of Null Hypothesis when it is true
  - (2) Rejecting the Null Hypothesis when it is true
  - (3) Rejecting the Null Hypothesis when Alternate Hypothesis is true
  - (4) Rejecting the Alternate Hypothesis when it is true
- 18.** Research provides the information for
- (1) Irrational decision-making
  - (2) Guessing the outcome
  - (3) Rational decision-making
  - (4) None of the above
- 19.** In an experiment, blood pressure levels of 15 subjects were measured before and after a particular intervention. The probable statistical test is
- (1) t-test
  - (2) Independent t-test
  - (3) Paired t-test
  - (4) Z-test
- 20.** Select the odd one out of the following :
- (1) Signed Rank Test
  - (2) Mann-Whitney U Test
  - (3) t-test
  - (4) Kruskal-Wallis Test

- 21.** If multiple statistical tests are done on the same data, then
- (1) Type-I error decreases
  - (2) Type-II error decreases
  - (3) Type-I error increases
  - (4) Type-II error increases
- 22.** James Lind carried out the first controlled clinical trial on which of the following diseases ?
- (1) Pellagra
  - (2) Rickets
  - (3) Scurvy
  - (4) Angular cheilitis
- 23.** Critical evaluation of a study requires all of the following *except*
- (1) Understanding of Study Design
  - (2) Understanding of Analysis Methods
  - (3) Ability to Reproduce the Study
  - (4) Ability to Assess the Strength of Evidence
- 24.** Pre-clinical Research refers to
- (1) Testing of new products before marketing
  - (2) Testing of drug levels in patients to determine optimal dose
  - (3) Development of potential new therapeutic modalities
  - (4) Development of methods for evaluation of efficacy
- 25.** If 400 persons are surveyed and 40 are found to have hypertension, then the survey has measured the
- (1) Disease frequency
  - (2) Disease probability
  - (3) Disease incidence
  - (4) Disease prevalence

- 26.** Incidence rates can be best calculated in
- (1) Case series
  - (2) Case control studies
  - (3) Cohort studies
  - (4) Randomized controlled trials
- 27.** A Case Control Study
- (1) May begin with exposure
  - (2) Always begins with exposure
  - (3) May begin with disease
  - (4) Always begins with disease
- 28.** Multiple outcomes are best studied in
- (1) Randomized Controlled Trial
  - (2) Case Control Study
  - (3) Cohort Study
  - (4) None of the above
- 29.** When the period of follow-up in a study varies, appropriate analytic techniques include
- (1) Survival Analysis
  - (2) Proportional Hazards Model
  - (3) Both the above
  - (4) None of the above
- 30.** All of the following are the advantages of a Cohort Study *except*
- (1) Ability to assess incidence
  - (2) Ability to assess rare exposures
  - (3) Ability to assess rare outcomes
  - (4) Ability to study temporality between exposure and outcome

- 31.** The process to assign patients without bias to different patient groups in a clinical trial is called
- (1) Allocation
  - (2) Assignment
  - (3) Randomization
  - (4) Blinding
- 32.** A phase-4 trial evaluates
- (1) Dosage
  - (2) Delivery mechanisms
  - (3) Short-term safety
  - (4) Long-term safety
- 33.** A trial can be stopped before the completion because of
- (1) Unacceptable side-effects
  - (2) Fraud or misconduct
  - (3) Treatment arm is convincingly different
  - (4) All of the above
- 34.** t-tests are most useful for which type of data ?
- (1) Continuous
  - (2) Ordinal
  - (3) Nominal
  - (4) Binary
- 35.** Level of measurement for the variable temperature is
- (1) Nominal
  - (2) Ordinal
  - (3) Interval
  - (4) Ratio

36. If the grading of anaemia is classified as mild, moderate and severe, the scale of measurement used is
- (1) Interval
  - (2) Nominal
  - (3) Ordinal
  - (4) Ratio
37. The height of a student is 50 inches. This is an example of which of the following ?
- (1) Qualitative data
  - (2) Categorical data
  - (3) Continuous data
  - (4) Discrete data
38. Which of the following is *not* based on all the observations ?
- (1) Arithmetic Mean
  - (2) Geometric Mean
  - (3) Harmonic Mean
  - (4) Mode
39. You asked 10 of your friends about their weights. On the basis of this information you stated that average weight of the group is 48 kg. This is an example of
- (1) Descriptive Statistics
  - (2) Parameter
  - (3) Inferential Statistics
  - (4) Population
40. Which of the following is a measure based on every item of observation ?
- (1) Mode
  - (2) Range
  - (3) Standard Deviation
  - (4) Quartile Deviation



41. To test whether or not two population variances are equal, the appropriate distribution is
- (1) Z-distribution
  - (2) Chi-square distribution
  - (3) F-distribution
  - (4) T-distribution with  $n_1 + n_2 - 2$  degrees of freedom
42. A larger sample size is required when
- (1) The population of interest for a study is less diverse
  - (2) A low level of precision is required
  - (3) The population of interest is easily recruited to the study
  - (4) High level of precision is required
43. A sample can be defined as a
- (1) Population of interest to a researcher
  - (2) Quota from within the whole population
  - (3) Subset of a population and representative of the population of interest to the researcher
  - (4) Criterion used to define eligibility for the research study
44. A random sample is expected to approximate a normal distribution because
- (1) A small sample size is not an issue
  - (2) There are equal numbers of below and above average cases
  - (3) The sample will contain mainly average cases
  - (4) The goal is to maximise the sampling error
45. An independent variable in a study
- (1) Can only be a single variable
  - (2) Is an outcome that is determined by an unbiased observer
  - (3) Cannot be determined by inclusion and exclusion criteria
  - (4) Is a parameter that can be determined or manipulated at the outset

- 46.** Which of the following is *not* included in the Bradford Hill criteria for assessing causality ?
- (1) Consistency
  - (2) Temporality
  - (3) Specificity
  - (4) Sensitivity
- 47.** A random error
- (1) Is not affected by sample size
  - (2) Can be controlled by increasing accuracy
  - (3) Can be corrected by adjusting for error in measurement
  - (4) Is transient, inconsistent and cannot be corrected
- 48.** Sources of variation in measurement may arise from
- (1) Instrument
  - (2) Observer
  - (3) Biological differences
  - (4) All of the above
- 49.** An example of an analytic study design is
- (1) Ecological
  - (2) Case series
  - (3) Cross-sectional
  - (4) Case control
- 50.** Appropriate graphical representation for the continuous data is
- (1) Bar Graph
  - (2) Histogram
  - (3) Line Chart
  - (4) None of the above

## **PART B**

*Write short notes on any **four** of the following in about 200 – 300 words each.  
Each note carries **five (5)** marks.*

**4×5=20**

- 51. Measurement of Dispersion**
- 52. Chi-Square Test**
- 53. Graphical Presentation of Data**
- 54. Probability Sampling**
- 55. Types of Errors in Research Studies**
- 56. Phases of Clinical Trials**