



## Hemchandracharya North Gujarat University PHD Exam

Exam Name : HNGU\_PHD\_Microbiolgy\_31.01.2024\_09.30 AM TO 11:30 AM

Exam Date : 2024-01-31

Exam Time : 09:30:00 AM To 11:30:00 AM

Total Marks : 100

**Note : The correct answer is indicated by the green color. સાચો જવાબ લીલા રંગ દ્વારા સૂચવવામાં આવે છે.**

Question List:

Section: Section-A

- State the types of evolutionary research (1) Contemporary evaluation (2) Periodic evaluation (3) Final evaluation (4) Political evaluation [ 1 Mark ]
  - 1 and 2
  - **1, 2, and 3**
  - 1, 2, 3, and 4
  - 2 and 3
- Cricket run data is related to which kind of scale? [ 1 Mark ]
  - Nominal scale
  - Ordinal scale
  - **Interval scale**
  - Ratio scale
- Which of the following intermediate criteria is used to calculate the nominal scale? [ 1 Mark ]
  - Mean
  - Median
  - **Mode**
  - None of these
- The annual income of the family; this data is related with which kind of scale? [ 1 Mark ]
  - Nominal scale
  - Ordinal scale
  - Interval scale
  - **Ratio scale**
- What kind of data is collected through the questionnaire? [ 1 Mark ]
  - Time series data
  - **Cross-sectional data**
  - Panel data
  - All of these

- **What kind of source is a book written by an expert called 'Review of Gandhiji's Autobiography' to examine the values described in Gandhiji's autobiography? [ 1 Mark ]**
  - Primary reference
  - Early reference
  - Supplementary References
  - **Secondary reference**
  
- **What is a pilot study? [ 1 Mark ]**
  - An experimental study
  - **A study to test the tool of data collection.**
  - A small scale study.
  - A study that is conducted first time.
  
- **In which research method is it necessary to check the effect of grooming on the sample characters? [ 1 Mark ]**
  - **Experimental method**
  - Cause-comparative method
  - Developmental method
  - Historical method
  
- **The problem solver and the researcher are the same [ 1 Mark ]**
  - **In Action research**
  - In practical research
  - In basic research
  - Survey research
  
- **The eating habits of people in urban areas are different from those in rural areas' - which research method could have been used to achieve this result? - [ 1 Mark ]**
  - Content analysis method
  - Developmental method
  - Historical method
  - **Survey method**
  
- **What is the type of information that classified below? Classified information: (1) Pass (2) Fail [ 1 Mark ]**
  - **Binary-nominal**
  - Binary-ordinal
  - Ratio measurement
  - Interval measurement
  
- **The data collected from published reports is known as: [ 1 Mark ]**
  - Organized data
  - Independent information
  - **Secondary data**
  - Primary data
  
- **If the Critical region is evenly distributed then the test is referred as? [ 1 Mark ]**
  - 2- tailed
  - **1- tailed**
  - 3- tailed
  - 0- tailed
  
- **Alternative Hypothesis is also called as? [ 1 Mark ]**
  - Composite hypothesis
  - **Research Hypothesis**
  - Simple Hypothesis
  - Null Hypothesis-
  
- **The purpose of hypothesis testing is to: [ 1 Mark ]**
  - Test how far the mean of a sample is from zero

- **Determine whether a statistical result is significant**
  - Determine the appropriate value of the significance level
  - Derive the standard error of the data
- **The difference between a statistic and the parameter is called: [ 1 Mark ]**
    - Non-random
    - **Sampling error**
    - Probability
    - Random
- **Which of the following is not a probability sampling? [ 1 Mark ]**
    - Simple random sampling
    - Stratified sampling
    - **Quota sampling**
    - Cluster sampling
- **Stratified sample is used when the population is: [ 1 Mark ]**
    - Homogeneous
    - **Heterogeneous**
    - Too small
    - Very large
- **The sample section in the research proposal needs to provide information about \_\_\_\_\_. [ 1 Mark ]**
    - The software used
    - The names of participants
    - **The sampling population**
    - The type of analysis used
- **The two important components of research responsibility are: sincerity in work and avoiding \_\_\_\_\_. [ 1 Mark ]**
    - **Plagiaris**
    - Confidentiality
    - Research techniques
    - None of these
- **Abbreviation 'ibid' used for footnotes and Bibliography for - [ 1 Mark ]**
    - **Same reference**
    - Same person
    - That is
    - And others
- **In which sampling method population is divided into different strata and sample is taken from different strata ? - [ 1 Mark ]**
    - Quota sampling
    - **Stratified sampling**
    - Snowball sampling
    - Purposive sampling
- **Full form of MLA style: [ 1 Mark ]**
    - Modern Language Awareness
    - Modern Language Academy
    - **Modern Language Alliance**
    - Modern Language Association
- **Population value is called [ 1 Mark ]**
    - Statistic
    - **Parameter**
    - Variable
    - Information

- **Why do you need to review the existing literature? - [ 1 Mark ]**
  - To make sure you have a long list of references
  - Because without it, you could never reach the required word-count
  - **To find out what is already known about your area of interest**
  - To help in your general studying
  
- **A type I (1) error occurs when we: [ 1 Mark ]**
  - **Reject a false Null Hypothesis-**
  - Reject a true Null Hypothesis
  - Do not reject a false Null Hypothesis
  - Do not reject a true Null Hypothesis
  
- **Level of significance lies between: [ 1 Mark ]**
  - -1 and +1
  - 0 and n
  - **0 and 1**
  - $-\infty$  to  $+\infty$
  
- **Reliability and transparency are fundamental: [ 1 Mark ]**
  - Issues in business.
  - **Ethical principles in research.**
  - Requirements in research.
  - Methodologies in research
  
- **Good research proposals will always: - [ 1 Mark ]**
  - **Focus on addressing the research objectives.**
  - Provide respondent names and addresses.
  - Focus on the Harvard style.
  - Consider all possible research that had previously been done on the topic
  
- **What is a sample called if it represents one or few characteristics of the population more than the others? [ 1 Mark ]**
  - Good sample
  - Bad sample
  - **Biased sample**
  - Ineffective sample
  
- **The principle of informed consent is [ 1 Mark ]**
  - Of little use in business research.
  - **A key ethical concern.**
  - Essential to the relationship between the researcher and the research project.
  - A key data gathering method.
  
- **Which symbol represents the mean of population? [ 1 Mark ]**
  - M
  - Z
  - **$\mu$**
  - Z
  
- **If Mean > Median > Mode then which type of skewness is it. [ 1 Mark ]**
  - **Positive skewness**
  - Negative skewness
  - Zero skewness
  - None of these
  
- **Addition, theorem states that if two events A and B are mutually exclusive, the probability of occurrence of either A or B is given by: [ 1 Mark ]**
  - **$P(A)+P(B)$**
  - $P(A) \times (B)$
  - $P(A) \times (B) - P(AB)$

- None of these
- **if  $y = 0.15x - 1000$  is a linear equation. Find  $y$  when  $x = 1200$ . [ 1 Mark ]**
  - 900
  - **800**
  - 700
  - 600
- **What is a MATLAB script file? [ 1 Mark ]**
  - **A text file that stores MATLAB commands**
  - An image file that displays plots
  - A data file that is organized in layers
  - A program file that is executed by other software
- **What does Microsoft Excel do? [ 1 Mark ]**
  - Create graphics
  - **Store and analyze data**
  - Build websites
  - Send emails
- **Percentage (%) sign is used in an URL to represent [ 1 Mark ]**
  - **Space**
  - Data
  - Time
  - Person
- **What is an array in MATLAB? [ 1 Mark ]**
  - A series of continuous data points
  - **A collection of data arranged in a grid**
  - A data set without a structure
  - Information stored in a text file
- **What steps should be followed for data storage and management? [ 1 Mark ]**
  - Back up data
  - Keep data in its original format
  - Document data
  - **All of these**
- **A person's age is three times more than the age of B person. The total of their ages is 64 years. Find the age of person A and B. [ 1 Mark ]**
  - **48, 16**
  - 16, 64
  - 64, 16
  - 22, 42
- **Q is shorter than P but taller than R. R is shorter than P but taller than A. W is shorter than A. If they stand in ascending order of their height, the order in which they are standing would be [ 1 Mark ]**
  - WARPQ
  - ARWQP
  - **WARQP**
  - WRQRP
- **In a garden, there are peacocks and four-footed animals. All these 98 feet and 35 heads. How many peacocks are there? [ 1 Mark ]**
  - 19
  - **21**
  - 23
  - 25

- In a row of girls, Bindu is twelfth from either end of the row. How many girls are there in the row? [ 1 Mark ]
  - 13
  - **23**
  - 24
  - 25
  
- From Vadodara station, if we buy two tickets to station P and three tickets to station Q, the total cost is Rs.77, but if we buy 3 tickets to station P and 5 tickets to station Q, the total cost is Rs.124. The fare from Vadodara to P is [ 1 Mark ]
  - **13**
  - 14
  - 18
  - 20
  
- He was sent to the prison for his \_\_\_\_\_. [ 1 Mark ]
  - Sin
  - Vice
  - **Crime**
  - Guilt
  
- The American could not decide which ring he wanted to buy. (Replace underlined verb with phrasal verb from the bracket.) [ 1 Mark ]
  - Make with
  - Make up
  - **Make out**
  - Make in
  
- She is a very regular student. She \_\_\_\_\_ to the college every day. [ 1 Mark ]
  - **Comes**
  - Is coming
  - Was coming
  - Coming
  
- Select the correct sentence from below: [ 1 Mark ]
  - If you had worked hard, you will have succeed in life
  - If you work hard, you would have succeeded in life.
  - If you had worked hard, you will succeed in life.
  - **If you work hard, you will succeed in life.**
  
- \_\_\_\_\_ it is raining, lets drop the plan of going to the picnic. [ 1 Mark ]
  - Therefore
  - **As**
  - So
  - And

### Section: Section-B

- Shell-vial centrifugation culture proposed for fast microbial diagnosis has recently used for the identification of: [ 1 Mark ]
  - Aerobic bacteria
  - Pathogenic protozoa
  - Pathogenic fungi
  - **Respiratory viruses**
  
- Where does formation of Acetyl CoA from pyruvic acid take place? [ 1 Mark ]
  - Chloroplast
  - **Cytoplasm**
  - Mitochondria
  - Glyoxysome

- The principal function of the TCA cycle is to: [ 1 Mark ]
  - Generate CO<sub>2</sub>
  - **Transfer electrons from the acetyl portion of acetyl CoA to NAD<sup>+</sup> and FAD**
  - Oxidize the acetyl CoA to oxaloacetate
  - Dispose of excess pyruvate and fatty acids
- Which of the following vitamins is required for synthesis of a cofactor required for reactions in the oxidation of pyruvate to CO<sub>2</sub> and H<sub>2</sub>O? [ 1 Mark ]
  - **Pantothenate**
  - Vitamin K
  - Biotin
  - Ascorbate
- First recombinant molecule expressed in bacteria for human use was: [ 1 Mark ]
  - Somatostatin
  - Thaumatin
  - Lysine
  - **Insulin**
- All of the following are polymers of glucose except: [ 1 Mark ]
  - Starch
  - **Inulin**
  - Dextrin
  - Cellulose
- Which of the following condition is best suited for extraction of Cephalosporin C from fermentation broth? [ 1 Mark ]
  - Slightly alkaline
  - **Slightly acidic**
  - Highly alkaline
  - Highly acidic
- Which of the following method is not used for analysis of Carbohydrates? [ 1 Mark ]
  - Cole's method
  - Anthrone's method
  - **Folin-lowry's method**
  - DNS method
- Which of the following microorganism is used for the production of ethyl alcohol? [ 1 Mark ]
  - Torula cremoris
  - Clostridium thermosaccharolyticum
  - Saccharomyces fragilis
  - **All of these**
- Which one of the following is considered as modern molecular method used for microbial identification? [ 1 Mark ]
  - Serotyping
  - Biotyping
  - **Ribotyping**
  - Phage typing
- Identification based on the specific fatty acid composition of the cell wall in bacteria and yeast is done by: [ 1 Mark ]
  - GC-MS
  - HPTLC
  - **GC-FAME**
  - PFGE
- If the enzyme is immobilized externally, the size of the carrier particle must be: [ 1 Mark ]
  - Large
  - Small
  - Medium
  - None of these

- **Very Small**
  - Very Large
  - Same as that of enzyme
  - Slightly larger than enzyme
- **Which of the following method is universally applicable and reported in a wide range of bacteria, fungi and algae? [ 1 Mark ]**
    - Site directed mutagenesis
    - Conjugation
    - Prarssexual Cycle
    - **Protoplast fusion**
- **Effective Microorganism Technology is purported to support: [ 1 Mark ]**
    - Sustainable practices in farming
    - Disaster clean-up
    - Compost and waste management
    - **All of these**
- **Thymine is present in which type of RNA? [ 1 Mark ]**
    - m RNA
    - **t RNA**
    - hn RNA
    - r RNA
- **When base-pairing occurs in loops of RNA, adenine is hydrogen-bonded to: [ 1 Mark ]**
    - Guanine
    - Thymine
    - Cytosine
    - **Uracil**
- **Which of the following statements concerning replication of DNA is true? [ 1 Mark ]**
    - **It progresses in both directions away from each point of origin on the chromosome**
    - It requires a DNA template that is copied in its 5' to 3' direction
    - It occurs during M phase of the cell cycle
    - It produces one newly synthesized double helix and one double helix composed of the two parental strands.
- **Which of the following statements concerning Okazaki fragments is true? [ 1 Mark ]**
    - They are produced by restriction enzymes
    - They are synthesized on the leading strand during replication
    - They are regions of DNA that do not code for the amino acids in a protein
    - **They are relatively short polydeoxyribonucleotides with a few ribonucleotide residues at the 5' end**
- **A bacterial mutant grows normally at 32°C but at 42°C accumulates short segments of newly synthesized DNA. Which of the following enzymes is most likely to be defective in mutant? [ 1 Mark ]**
    - Helicase
    - DNA polymerase
    - **DNA ligase**
    - An exonuclease
- **Which of the following is not included in statistical analysis of data? [ 1 Mark ]**
    - Inferential analysis
    - **Editing**
    - Chi-square test
    - All of these
- **Activated sludge process design is almost based on which of the following? [ 1 Mark ]**
    - BOD
    - MLSS or MLVSS



- qO<sub>2</sub>
  - **All of these**
- **Genetic immunization involves the administration of: [ 1 Mark ]**
  - Antigen
  - Antibodies
  - **DNA**
  - RNA
- **All of the following are high-energy compounds except: [ 1 Mark ]**
  - Phosphoenolpyruvate
  - Carbamoyl phosphate
  - Creatine phosphate
  - **Fructose 6-phosphate**
- **Cytochrome oxidase of electron transport chain is inhibited by: [ 1 Mark ]**
  - **Carbon monoxide**
  - Rotenone
  - Carbon dioxide
  - Amytal
- **The energy liberated during the metabolic reactions is primarily: [ 1 Mark ]**
  - ADP
  - CTP
  - **ATP**
  - GTP
- **The enzymes of glycolysis are located in: [ 1 Mark ]**
  - Mitochondria
  - **Cytosol**
  - Nucleus
  - Lysosome
- **Rapaport-Leubering cycle, operative in RBC, is primarily concerned with the production of: [ 1 Mark ]**
  - 1,3-bisphosphoglycerate
  - **2,3-bisphosphoglycerate**
  - Pyruvate
  - Lactate
- **The number of NADH + H<sup>+</sup> produced in citric acid cycle: [ 1 Mark ]**
  - 1
  - 2
  - **3**
  - 4
- **The correlation coefficient is used to determine: [ 1 Mark ]**
  - A specific value of y-variable given a specific value of the x-variable
  - A specific value of x-variable given a specific value of the y-variable
  - **The strength of the relationship between the x and y variables**
  - None of these
- **The fatty acids in the body are predominantly oxidized by: [ 1 Mark ]**
  - $\alpha$ -oxidation
  - **$\beta$ -oxidation**
  - $\gamma$ -oxidation
  - $\omega$ -oxidation

- **Direct improvement of cellular properties through the modifications of specific biochemical reactions or the introduction of new ones, with the use of rDNA technology is referred to as: [ 1 Mark ]**
  - **Metabolic engineering**
  - Genetic engineering
  - Protein engineering
  - Biochemical engineering
- **Genomic plasticity of pathogenic bacteria responsible for their adaptation to host can be increased by: [ 1 Mark ]**
  - Vertical gene transfer
  - **Horizontal gene transfer**
  - Physical mutagens
  - Chemical mutagens
- **Oxidative phosphorylation is the metabolic pathway that uses energy released by oxidation of nutrients to produce: [ 1 Mark ]**
  - NADPH
  - NADH
  - GTP
  - **ATP**
- **Which of the following was the first to be modified in laboratory? [ 1 Mark ]**
  - Mice
  - **Bacteria**
  - Plant
  - Virus
- **A genetic technique in which an organism is engineered to carry genes that has been made inoperative is known as: [ 1 Mark ]**
  - Dysfunctional technique
  - Gene therapy
  - **Gene knockout**
  - Silent gene
- **The collection, cataloguing and analysis of organisms including microorganisms and plants with the intent of finding a useful application and/or to document biodiversity is known as: [ 1 Mark ]**
  - Bionics
  - Biolistic
  - **Bioprospecting**
  - Bioinformatics
- **Unlike other tests of significance, Chi square easily handles situation in which: [ 1 Mark ]**
  - **The variables have more than two categories or score**
  - The variables have less than two categories or score
  - Variables are all ordinal in level of measurement
  - Degrees of freedom exceed 100
- **Blocking agents are used in molecular cloning to stop non-specific binding of probes in: [ 1 Mark ]**
  - Southern blotting
  - Western blotting
  - Northern blotting
  - **All of This**
- **The amount of ingested alcohol absorbed into the body's cells and its intracellular fluid is measured as: [ 1 Mark ]**
  - Absorbed alcohol concentration
  - **Blood alcohol concentration**
  - Intracellular alcohol concentration
  - None of above

- **Vegetative outgrowth of yeast is best known as: [ 1 Mark ]**
  - Over growth
  - Abnormal growth
  - Fragmentation
  - **Budding**
  
- **Buffer is a system which resists changes in: [ 1 Mark ]**
  - Temperature
  - **pH**
  - Acidity
  - Alkalinity
  
- **Number of phages released by a host cell during the lytic cycle is known as: [ 1 Mark ]**
  - Phage number
  - Phage units
  - **Burst size**
  - Burst number
  
- **The yeast two-hybrid system is designed to identify which of the following? [ 1 Mark ]**
  - Multiprotein complex
  - **Protein-protein interactions**
  - RNA-DNA interactions
  - All of this
  
- **Interactome networks are also called: [ 1 Mark ]**
  - **Protein interaction maps**
  - RNA interaction maps
  - Carbohydrate interaction maps
  - DNA interaction maps
  
- **Which is the first automated non-radiometric and non-invasive culture system that continuously monitors system for culture of bacteria? [ 1 Mark ]**
  - **BacT/Alert 3D**
  - MALDI-TOF
  - BACTAC-9000
  - Phoenix BD
  
- **A region in a genome that was introduced in an ancestral microbe by horizontal gene transfer is known as: [ 1 Mark ]**
  - Genomic reduction
  - Genotype
  - **Genomic island**
  - Genomic fingerprint
  
- **Majority of techniques associated with genetic engineering have been developed within system of which organism? [ 1 Mark ]**
  - **Escherichia coli**
  - Saccharomyces cerevisiae
  - Neurospora crassa
  - Streptomyces fradiae
  
- **Which one of the following process in waste water treatment methods is classified in physical operation? [ 1 Mark ]**
  - Trickling filters
  - Adsorption
  - Aerated lagoon
  - **Flotation**
  
- **Who mapped the whole nucleotide sequence of  $\phi$ X174? [ 1 Mark ]**
  - Beadle and Tatum

- Barrell
- **Sanger**
- Thomas Cech

- **The baiting of samples with a range of sterile solid substrates is a technique used commonly to enrich which of the following group of microorganism prior to their isolation by plating methods? [ 1 Mark ]**

- Algae
- Bacteria
- Protozoa
- **Actinomycetes**