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PD - 02

Total No. of Pages : 12

Ph.D Entrance Examination, March/April, 2026

BIOCHEMISTRY / BIOTECHNOLOGY

Subject Code : 58808

Day and Date : Tuesday, 06-10-2026

Total Marks : 100

Time : 01.00 p.m. to 03.00 p.m.

Instructions :

- 1) All questions are compulsory.
- 2) Each question carries 2 marks.
- 3) Answers should be marked in the given OMR answer sheet by darkening the appropriate option.
- 4) Use black ball point pen only for marking the circle. Do not make any stray mark on the OMR answer sheet.
- 5) Follow the instructions given on OMR Sheet.
- 6) Rough work shall be done on the sheet provided at the end of question paper.
- 7) Only non-programmable calculators are allowed.

1. The demerits of sampling methods is

- a) Existence of sampling errors
- b) Requirements of adequately trained personnel for sample survey
- c) Non-uniformity in sample units
- d) All of the above

2. Research is basically

- a) a methodology of enquiry
- b) search of truth
- c) a systematic exploration of facts
- d) All of the above

3. A tentative proposition subject to test is
 - a) Variable
 - b) Hypothesis
 - c) Data
 - d) Concept
4. Who defined "Research" as "systematized effort to gain new knowledge"
 - a) Tom & Zerry
 - b) Redman and Mory
 - c) F.W Taylor
 - d) Ross Taylor
5. Which of the following is the Objective of the Research?
 - a) To become familiar with a phenomenon
 - b) To test a hypothesis of a causal relationship between variables
 - c) To determine the frequency with which something occurs or with it is associated with something else.
 - d) All of the above
6. In the word "RESEARCH" "A" means
 - a) Articulate
 - b) Artist
 - c) Article
 - d) None of the above
7. A test of research aptitude for candidates of the UGC NET, is aimed at
 - a) providing basic idea of search to the candidates
 - b) Screening the persons having scientific bent of mind
 - c) providing a database of 'future' scientists of the country to the Government
 - d) putting obstacles to the candidates

8. The main purpose of research in education is to
 - a) help in individual's personal growth
 - b) increase the social prestige of an individual
 - c) increase individual's market value of jobs
 - d) help the individual to become an eminent educationist
9. Where is the objective observation used?
 - a) In conducting experiments
 - b) In research
 - c) In normal behaviour
 - d) In almost all the situations
10. Inferring about the whole population on the basis of the observations made on a small part is called
 - a) deductive inference
 - b) inductive inference
 - c) objective inference
 - d) pseudo-inference
11. A hypothesis is a
 - a) Tentative statement whose validity is still to be tested
 - b) Supposition which is based on the past experiences
 - c) Statement of fact
 - d) All of the above
12. What do you mean by synopsis of a research project?
 - a) The blue print of research
 - b) Extracts from the research observations
 - c) A plan of the research
 - d) Summary of the findings of the research

13. Can a problem be stated?

- a) By putting forward a question
- b) Making a statment which is declarative in nature
- c) Both 'A' and 'B'
- d) None of the above

14. What do you mean by an assumption?

- a) It is a framework in which research work has to be done
- b) It simplifies the logical process of arriving at the solution
- c) It is a restrictive condition
- d) None of the above

15. A null hypothesis is

- a) hypothesis of no difference
- b) Hypothesis that assigns value of zero to the variable
- c) Hypothesis of zero significance
- d) None of the above

16. The preparation of a synopsis is

- a) An art
- b) A science
- c) Both 'A' and 'B'
- d) None of these

17. The advantage of sampling is

- a) time-saving
- b) capital-saving
- c) increased accuracy
- d) Both 'A' and 'B'

18. In case of destructive testing, the best method of research is

- a) Sampling
- b) Complete enumeration
- c) Census survey
- d) None of the above

19. The method of Randomization involves

- a) lottery
- b) Coin method
- c) Tippit's table of random digits
- d) All of the above

20. The advantages of random sampling is that

- a) It is free from personal biases
- b) It produces reasonably accurate results
- c) It is an economical method of data. Collection
- d) All of the above

21. Tippit table is

- a) A table of random digits
- b) Used in statistical investigations
- c) Used in sampling methods
- d) All of the above

22. In "RESEARCH" "R" means

- a) Role
- b) Retain
- c) Relly
- d) Round

23. What is the meaning of Randomization?

- a) Each and every unit of the population has an equal chance of selection in the sample
- b) The selection or non-selection of a unit of population does not affect the selection or non-selection of the other unit of the population in the sample
- c) It is a method of selection which is free from subjective biases.
- d) All of the above

24. Type-1 Error occurs when
- a) The null hypothesis is rejected even when it is true
 - b) The null hypothesis is accepted even when it is false
 - c) The null hypothesis as well as Alternative hypothesis, both is rejected
 - d) None of the above
25. What is/are the base(s) of formulation of a Hypothesis?
- a) Reflection
 - b) Deduction
 - c) Observation
 - d) All of these
26. The small-scale bioreactors have volume of
- a) 5-10 litres
 - b) 10-20 litres
 - c) 1-10 litres
 - d) 1-20 litres
27. Which of the following fermenters are characterized by height to diameter ratio?
- a) Tower fermenter
 - b) Airlift fermenter
 - c) Hollow fibre
 - d) Perfusion bioreactor
28. The end products in ethanol fermentation are
- a) Ethanol and CO₂
 - b) Ethanol and O₂
 - c) Ethanol, H₂ and CO₂
 - d) Ethanol, O₂ and CO₂
29. Which of the following is used to grow anchorage-dependent cells?
- a) Airlift fermenter
 - b) Tower fermenter
 - c) Hollow fibre chamber
 - d) Perfusion bioreactor

30. DNA denaturation is measured by absorbance at
- a) 220nm
 - b) 230nm
 - c) 250nm
 - d) 260nm
31. Which is not step of Descriptive Statistics?
- a) Collecting
 - b) Organizing
 - c) Hypothesis testing
 - d) Presenting Data
32. Which is related to Frequency Distribution?
- a) Variable
 - b) Frequency
 - c) Class Interval
 - d) All of above
33. If Class intervals are not given, then it is called as a
- a) Discrete Frequency Distribution
 - b) Continuous Frequency Distribution
 - c) Grouped Frequency Distribution
 - d) None of above
34. Name the coenzyme of riboflavin (B2)?
- a) NAD or NADP
 - b) FAD and FMN
 - c) Coenzyme A
 - d) Thiamine pyrophosphate
35. Figure indicates which type of Graph?
- a) Line frequency Graph
 - b) Histogram
 - c) Frequency polygon
 - d) Ogive
36. The coding sequences found in split genes are called
- a) Operons
 - b) Introns
 - c) Exons
 - d) Cistrons

37. The constituent unit of inulin is

- a) Glucose
- b) Fructose
- c) Mannose
- d) Galactose

38. Sick cell anemia is caused

- a) When valine is replaced by glutamic acid in beta polypeptide chain
- b) When glutamic acid is replaced by valine in beta polypeptide chain
- c) When glutamic acid is replaced by valine in alpha polypeptide chain
- d) When valine is replaced by glutamic acid in alpha polypeptide chain

39. Wobble position means

- a) Base pairing
- b) Altered base on code
- c) Third altered base on codon
- d) None of the above

40. Peptidyl transferase

- a) Is a 23s rRNA
- b) Forms peptide bonds
- c) Component of ribosome
- d) All the above

41. In the growth equation: $n = 3.3 (\log_{10} N - \log_{10} N_0)$, n stands for

- a) Total population
- b) Initial population
- c) Number of generations
- d) Growth constant

42. The DNA of Klebsiella pneumonia has a moles % G+C content of?

- a) 70-71
- b) 50-53
- c) 56-58
- d) 32-35

43. According to Bergey's Manual of Systematic Bacteriology, prokaryotes that lack a cell wall belong to the group?
- a) Gracilicutes
 - b) Firmicutes
 - c) Tenericutes
 - d) Mendosicutes
44. In Phase contrast microscopy, the rate at which light enters through objects is
- a) Constant
 - b) Inversely proportional to their refractive indices
 - c) Directly proportional to their refractive indices
 - d) Exponentially related to their refractive indices
45. In an SDS-PAGE electrophoresis
- a) Proteins are denatured by the SDS
 - b) Proteins have the same charge-to-mass ratio
 - c) Smaller proteins migrate more rapidly through the gel
 - d) All of the above
46. Proteins can be visualized directly in gels by
- a) Staining them with the dye
 - b) Using electron microscope only
 - c) Measuring their molecular weight
 - d) None of these

47. Electrophoresis of histones and myoglobin under non-denaturing conditions (pH = 7.0) results in
- a) both proteins migrate to the anode
 - b) histones migrate to the anode and myoglobin migrates to the cathode
 - c) histones migrate to the cathode and myoglobin migrates to the anode
 - d) both proteins migrate to the cathode
48. Which part of brain is involved in planning, decision making and speech?
- a) Occipital lobe
 - b) Frontal lobe
 - c) Temporal lobe
 - d) Thalamus
49. What is the concentration of Na^+ ions inside and outside of the neuron?
- a) In side 10-20 mM and outside 180-200 mM
 - b) In side 5-10 mM and outside 125-150 mM
 - c) In side 20-30 mM and outside 150-200 mM
 - d) In side 30-40 mM and outside 200-250 mM
50. Which of the following is an example of Homology and similarity tool?
- a) BLAST
 - b) RasMol
 - c) EMBOSS
 - d) PROSPECT



- Rough Work -

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