Shivaji University, Kolhapur
Ph.D Entrance Examination
Biochemistry/Biotechnology
Subject Code:

Day/Date:

Time: Total Marks: 100

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.

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1. In "RESEARCH" "R" means
(A) Role
(B) Retain
(C) Relly
(D) Round

2. In the word "RESEARCH" "A" means
(A) Articulate
(B) Artist
(C) Article
(D) None of the above

3. Research is derived from
(A) Latin
(B) Indian
(C) Greek
(D) Japanizes

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. Research is basically
(A) a methodology of enquiry
(B) search of truth
(C) a systematic exploration of facts
(D) All 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 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 accurary
(D) Both 'A' and 'B'

18. In case of destructive testings, 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. 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

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 are 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. In which of the following fermenters the impellers are replaced by the constant flow of gas?
a) Airlift fermenter
b) Tower fermenter
c) Hollow fibre
d) Perfusion bioreactor

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. Which of the following bioreactor consists of a vessel replaced by a multilayered bag?
a) Single Use bioreactors
b) Perfusion bioreactors
c) Airlift bioreactor
d) Tower bioreactor

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?
b. Variable
c. Frequency
d. 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. Types of Class intervals are_____
a. Exclusive
b. Discrete
c. Inclusive
d. Option a and c

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 removal of which enzyme affects the synthesis of hnRNA in eukaryotes
a. RNA polymerase II
b. RNA primase
c. RNA polymerase III
d. RNA polymerase I

38. 14. Sickle 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 paring
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 electrophoresi
(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