

Entrance Test for Ph.D. Programme-2018

Time: 120 Minutes

Max Marks: 100

Discipline: Biotechnology

Set: A

Test ID: 73

Name:

Father Name:

Roll Number: **Date:**/...../.....

Roll Number in words:

Signature of Candidate:

Signature of Invigilator:

INSTRUCTIONS FOR CANDIDATES

1. Do not open seal before start of Exam.
2. Carefully fill all your details in top portion of this question paper. Don't leave any column blank.
3. Use blue/black ball point pen to fill details on question paper. Write only in capital letters.
4. Carefully fill all your details in top portion of OMR answer sheet. Also put your signatures at bottom portion of OMR.
5. Use only black ball point pen to fill details & darken circles on OMR sheet. Using pencil is strictly prohibited.
6. Carefully fill your Roll No, Test ID, Category, Paper Set and other required details on the OMR sheet.
7. Question paper consists of two sections. Section-I is of Research Methodology and Section-II is Subject specific. Each section contains 50 multiple choice questions. Total 100 questions of one mark each.
8. Maximum marks are 100.
9. Time allowed is 120 minutes.
10. Qualifying marks shall be 50% for General Category and 45% for Reserved Categories.
11. All questions are compulsory. No negative marking for wrong answers.
12. There are four alternative answers for each question out of which only one is correct.
13. You have to darken the circle of right answer on OMR answer sheet.
14. Questions left blank or attempted with two or more options/answers will not be evaluated.
15. Also read carefully the instructions on OMR answer sheet before attempting the questions.
16. Use of calculator is not allowed.
17. Log tables may be provided for calculation work, if required.
18. OMR sheet should not be folded or crushed. Don't put any stray marks on the sheet.
19. Circles on OMR sheet should be darkened completely. Incomplete/half filled circles will not be evaluated.
20. Do not use marker or white fluid on the OMR sheet.
21. The medium of the examination is English only.
22. No extra sheet will be provided for the rough work. Use the space inside the question paper pages for rough work.
23. Carrying mobile phones, electronic gadgets, notes or extra papers in examination hall is strictly prohibited.
24. Indulging in any form of unfair means, canvassing, impersonation or misbehaviour with examination staff will result in disqualification of your candidature.

Section-I
Research Methodology

1. Who authored the book "Methods in Social Research"?
 - A) Wilkinson
 - B) C R Kothari
 - C) Kerlinger
 - D) Goode and Halt

2. Social Science deals with
 - A) Objects
 - B) Human beings
 - C) Living things
 - D) Non-living things

3. "The Romance of Research" is authored by
 - A) Redmen and Mory
 - B) P. V. Young
 - C) Robert C. Meir
 - D) Harold Dazier

4. Which of the following is an example of primary data?
 - A) Book
 - B) Journal
 - C) Newspaper
 - D) Census Report

5. ICSSR stands for
 - A) Indian Council for Survey and Research
 - B) Indian Council for Strategic Research
 - C) Indian Council for Social Science Research
 - D) Inter National Council for Social Science Research

6. JRF stands for
 - A) Junior Research Functions
 - B) Junior Research Fellowship
 - C) Junior Fellowship
 - D) None of the above
7. In the formulation of problem, which of the following we need to give?
 - A) Title
 - B) Index
 - C) Bibliography
 - D) Concepts
8. Analogies are sources of
 - A) Data
 - B) Concept
 - C) Research
 - D) Hypothesis
9. When a hypothesis is stated negatively, it is called
 - A) Relational Hypothesis
 - B) Situational Hypothesis
 - C) Null Hypothesis
 - D) Casual Hypothesis
10. In a survey, there is an enumerator and
 - A) Guide
 - B) Respondent
 - C) Supervisor
 - D) Messenger
11. A short summary of Technical Paper is called
 - A) Article
 - B) Research Abstract

C) Publication

D) Guide

12. Ph.D. stands for

A) Doctor of Philosophy

B) Degree in Philosophy

C) Doctor of Psychology

D) None of the above

13. Failure to acknowledge the borrowed material; is called (Take and use of others as one's own)

A) Acknowledgement

B) Foot Notes

C) Index

D) Plagiarism

14. Data related to the Human beings are called

A) Territorial data

B) Organisational data

C) Peripheral data

D) Demographic data

15. Schedule is filled by which of the following?

A) Respondent

B) Enumerator

C) Everybody

D) None of the above

16. Questions in which only two alternatives are possible are called

A) Multiple choice questions

B) Dichotomous Questions

C) Open ended questions

D) Structured questions

17. Assigning numerals or other symbols to the categories or response is called
- A) Editing
 - B) Coding
 - C) Transcription
 - D) Tabulation
18. Tippet table refers to
- A) Table of random digits
 - B) Table used in sampling methods
 - C) Table used in statistical investigations
 - D) All of the above
19. Research and development become the index of development of country. Which of the following reasons are true with regards to the statement?
- A) Because R&D reflect the true economic and social conditions prevailing in a country.
 - B) Because R&D targets the human development.
 - C) Because R&D can improve the standard of living of the people in a country.
 - D) All of the above.
20. The word "Anusandhan" implies
- A) Attaining an aim
 - B) Goal orientation
 - C) Following an aim
 - D) Praying to achieve an aim
21. A Researcher wants to study the relationship of family size to income. He classifies his population into different income slabs and then takes a random sample from each slab in order. Which technique of sampling is he working with?
- A) Cluster sampling
 - B) Random sampling

C) Stratified Random sampling

D) Systematic sampling

For Q. 22-23. The following table gives the sales of batteries manufactured by a company over the years.

Number of different batteries sold (in thousands)

Year	Types of Batteries					
	4AH	7AH	32AH	35AH	55AH	Total
1992	75	144	114	102	108	543
1993	90	126	102	84	126	528
1994	96	114	75	105	135	525
1995	105	90	150	90	75	510
1996	90	75	135	75	90	465
1997	105	60	165	45	120	495
1998	115	85	160	100	145	605

22. What was the approximate percentage increase in the sales of 55AH batteries in 1998 compared to that in 1992?

A) 28%

B) 31%

C) 33%

D) 34%

23. The percentage of 4AH batteries sold to the total number of batteries sold was maximum in the year?

A) 1994

B) 1995

C) 1996

D) 1997

24. Look the series: 22, 21, 23, 22, 24, 23,

A) 22

B) 24

C) 25

D) 26

25. Which word does not belong to others?

A) Dodge

B) Flee

C) Duck

D) Avoid

26. Which of the following is not an essential element of report writing?

A) Research Methodology

B) Reference

C) Conclusion

D) None of the above

27. Which of the following is non-probability sampling?

A) Snowball

B) Random

C) Cluster

D) Stratified

28. In group interview, there are

A) One interviewer and one interviewee

B) More than one interviewer and one interviewee

C) One interviewer and more than one interviewee

D) More than one interviewer and more than one interviewee

29. Uniting various qualitative methods with quantitative methods can be called as

A) Coalesce

B) Triangulation

C) Bipartite

D) Impassive

30. Books and records are the primary sources of data in:

A) clinical research

B) historical research

C) laboratory research

D) participatory research

31. The important pre-requisites of a researcher in sciences, social sciences and humanities are

A) laboratory skills, records, supervisor, topic

B) Supervisor, topic, critical analysis, patience

C) archives, supervisor, topic, flexibility in thinking

D) topic, supervisor, good temperament, pre-conceived notions

32. A college wants to give training in use of Statistical Package for Social Sciences (SPSS) to researchers. For this the college should organize

A) Lecture

B) Seminar

C) Workshop

D) Conference

33. Which One of the following is not a quality of researcher?

A) Keeness in enquiry

B) He must be of alert mind

C) His assertion to outstrip the evidence

D) Unison with that of which he is in search

34. Null means?

A) One

B) Two

- C) Zero
- D) None of the above

35. The depth of any research can be judged by:

- A) title of the research
- B) duration of the research
- C) objectives of the research
- D) total expenditure on the research

36. Fundamental research reflects the ability to:

- A) Expound new principles
- B) Synthesize new ideals
- C) Evaluate the existing material concerning research
- D) Study the existing literature regarding various topics

37. A ratio represents the relation between

- A) Part and Part
- B) Part and Whole
- C) Whole and Whole
- D) All of the above

38. Circle graphs are used to show:

- A) How one part is related to other parts?
- B) How various sections share in the whole?
- C) How one whole is related to other whole?
- D) How various parts are related to the whole?

39. Field-work based research is classified as:

- A) Historical
- B) Empirical
- C) Biographical
- D) Experimental

40. Statistical measure based upon the entire population is called parameter while measure based upon a sample is known as:

- A) Inference
- B) Statistics
- C) Sample parameter
- D) None of these

41. The importance of the correlation co-efficient lies in the fact that:

- A) It is one of the most valid measure of statistics.
- B) It is a non-parametric method of statistical analysis.
- C) There is a linear relationship between the correlated variables.
- D) It allows one to determine the degree or strength of the association between two variables.

42. Which one of the following is the most comprehensive source of population data?

- A) Census
- B) National Sample Surveys
- C) Demographic Health Surveys
- D) National Family Health Surveys

43. Which correlation co-efficient best explains the relationship between creativity and intelligence?

- A) 0.3
- B) 0.5
- C) 0.6
- D) 1.0

44. Normal Probability Curve should be

- A) Zero skewed
- B) Positively skewed
- C) Negatively skewed
- D) Leptokurtic skewed

45. A doctor studies the relative effectiveness of two drugs of dengue fever. His research would be classified as
- A) Case Study
 - B) Ethnography
 - C) Descriptive Survey
 - D) Experimental Research
46. Newton gave three basic laws of motion. This research is categorized as
- A) Sample Survey
 - B) Applied Research
 - C) Descriptive Research
 - D) Fundamental Research
47. When two or more successive footnotes refer to the same work which one of the following expressions is used?
- A) et.al
 - B) op.cit
 - C) loc.cit
 - D) ibid
48. Nine year olds are taller than seven year olds. This is an example of a reference drawn from
- A) Vertical study
 - B) Time series study
 - C) Experimental study
 - D) Cross-sectional study
49. Which one of the following belongs to the category of good 'research ethics'?
- A) Publishing the same paper in two research journals without telling the editors
 - B) Trimming outliers from a data set without discussing your reasons in a research paper

C) Conducting a review of the literature that acknowledges the contributions of other people in the relevant field or relevant prior work

D) Including a colleague as an author on a research paper in return for a favor even though the colleague did not make a serious contribution to the paper

50. Which of the following are the basic rules of APA style of referencing format?

A) Alphabetically index reference list

B) Invert authors' names (last name first)

C) Italicize titles of longer works such as books and journals

D) All of the above

Section-II Biotechnology

51. Which is not a Database ?

- A. NCBI
- B. PDB
- C. UniProt
- D. dbEST

52. Bootstrap procedure is generally employed in ?

- A. Phylogeny
- B. Gene finding
- C. Homology search
- D. Motif modelling

53. Which is not a nucleotide submission tool ?

- A. ClustalW
- B. Sequin
- C. Webin
- D. Sakura

54. Multiple sequence alignment is used to ?

- A. Predict nucleotide similarity
- B. Predict bacterial identity
- C. Predict protein sequence
- D. None of the above

55. CpG islands and codon bias are tools used in eukaryotic genomics to ?

- A. Identify open reading frame
- B. Differentiate between eukaryotic and prokaryotic DNA sequences
- C. Find regulatory sequences
- D. Look for DNA-binding domain

56. Two-dimensional gels are used to ?
- A. Separate DNA fragments
 - B. Separate RNA fragment
 - C. Separate different proteins
 - D. Separate DNA from RNA
57. The nitrogen bases which pairs with hydrogen bonds are ?
- A. Adenine and Thymine
 - B. Adenine and Cytosine
 - C. Cytosine and Guanine
 - D. Cytosine and Adenine
58. All of the following are true of the polymerase chain reaction except ?
- A. Large amount of DNA must be isolated from the source organism
 - B. An automated thermocycler is used to heat and cool the reaction samples
 - C. Short pieces of DNA are called primers are added to the reaction mixture
 - D. A heat-stable DNA polymerase is used in the reaction mixture
59. A gene library ?
- A. Involves plasmid but not phage clones
 - B. Is a collection of DNA fragments from genome
 - C. Is created without the aid of restriction enzyme
 - D. Must be made with DNA isolated from a cell lysate
60. First complete plant genome sequence was done in ?
- A. Rice
 - B. *Arabidopsis*
 - C. *Pisum Sativum*
 - D. *Catharanthus roseus*
61. Number of Nucleotides in one complete turn of right handed DNA helix are ?
- A. 8

- B. 10
 - C. 12
 - D. 14
62. Which DNA move faster in agarose gel electrophoresis ?
- A. Supercoiled DNA
 - B. Circular DNA
 - C. Linear DNA
 - D. None of these
63. Ethidium bromide act as ?
- A. Tracking dye
 - B. Visualizing dye
 - C. Labelling dye
 - D. Both B & C
64. Which of these act as an antioxidant during DNA extraction ?
- A. Mercaptaethanol
 - B. EDTA
 - C. CTAB
 - D. NaCl
65. How many base pairs of DNA are generally wound around a histone octamer to form a nucleosome ?
- A. 200
 - B. 146
 - C. 10
 - D. 100
66. The site at which first nucleotide is added during transcription is known as ?
- A. Point of origin
 - B. Startise
 - C. Promoter

- D. Operator
67. J. Monod and F. Jacob are known for ?
- A. Operon concept
 - B. Central dogma
 - C. Reverse transcription
 - D. Semi conservative DNA replication
68. Fine structure of gene was worked out by ?
- A. S. Benzer
 - B. J. Monod and F. Jacob
 - C. H.G. Khorana
 - D. F. Sanger
69. Okazaki segments are formed during ?
- A. Transcription
 - B. Replication
 - C. Transduction
 - D. Translation
70. Term DNA microarray is synonymously used with ?
- A. Yeast-two hybrid system
 - B. DNA chip technology
 - C. Bioinformatics
 - D. cDNA
71. Somaclonal variation result due to ?
- A. Reshuffling of the genome
 - B. Transposon activation
 - C. Point mutation
 - D. All of the above
72. Which of the following is rooting hormone ?
- A. 2,4-D

- B. 2,4, 5-T
 - C. NAA
 - D. Cytokinin
73. Which technique is used to introduce genes into dicots ?
- A. Electroporation
 - B. Particle Acceleration
 - C. Microinjection
 - D. Ti plasmid infection
74. Klenow fragment without free nucleotides exhibits ?
- A. Exonuclease activity
 - B. Endonuclease activity
 - C. Nickase activity
 - D. No activity
75. Which of the following is not a function of mitotic cell division ?
- A. Asexual reproduction
 - B. Growth
 - C. Repair of damaged organs
 - D. Production of gametes
76. That the ribosomes participate in protein synthesis was shown by ?
- A. Nirenberg
 - B. Volkin and Astrachan
 - C. Jacob and Monod
 - D. Palade and Siekevitz
77. The genetic code was interpreted in the year ?
- A. 1968
 - B. 1973
 - C. 1953
 - D. 1909

78. Electrophoretic separation of nucleic acids is used in ?
- A. Southern Blotting
 - B. DNA sequencing
 - C. Both A & B
 - D. None of these
79. Which of these plant hormones is a growth inhibitor ?
- A. Abscisic acid
 - B. Auxin
 - C. Cytokinin
 - D. Gibberellin
80. The technique used to clean plants of virus infection involves using small shoot tips ?
- A. Meristem culture
 - B. Embryo rescue
 - C. Somaclonal variation
 - D. Tissue proliferation
81. Chromosomal aberrations may be characterized by all of the following except ?
- A. Chromosome loss
 - B. Inversions
 - C. Translocations
 - D. Frameshift mutation
82. Promoter regions are rich in ?
- A. AT
 - B. GC
 - C. AU
 - D. GU
83. *Eco* RI is an ?

- A. Ligase
 - B. Polymerase
 - C. Restriction enzyme
 - D. Gyrase
84. Which one of the following is without coenzyme activity ?
- A. Vitamin
 - B. Thiamine
 - C. Biotin
 - D. Riboflavin
85. Termination of transcription occurs in prokaryotes by ?
- A. Rho
 - B. Hairpin loop forming sequences
 - C. Ro-independent
 - D. All of the above
86. Out of the total RNA polymerase activity, RNA polymerase II constitutes ?
- A. 50-70 % of total activity
 - B. 20-40 % of total activity
 - C. 5-10 % of total activity
 - D. 100 % of total activity
87. Bt cotton was approved for commercial cultivation in India in the year ?
- A. 2002
 - B. 2006
 - C. 2008
 - D. 2009
88. During cell division, sometimes there will be failure of separation of sister chromatids. This event is called ?
- A. Interference
 - B. Coincidence

- C. Fusion
 - D. Non-disjunction
89. What potential benefits can we gain from genetically modified foods ?
- A. Long shelf life
 - B. Higher nutrient content
 - C. Reduced chemical use
 - D. All of the above
90. In the cell cycle DNA synthesis takes place during ?
- A. G1 phase
 - B. G2 phase
 - C. S phase
 - D. Prophase
91. During his experiments Mendel called genes by the term ?
- A. Factors
 - B. Characters
 - C. Traits
 - D. Qualities
92. During metaphase mitosis chromosomes ?
- A. Undergo coiling
 - B. Move towards the poles
 - C. Line up at the equator
 - D. Break and disintegrate
93. For Southern hybridization, how much DNA is required ?
- A. 100-500 ng
 - B. 100-500 μ g
 - C. 3-5 μ g
 - D. Any quantity
94. Replication occurs in ?

- A. S phase
- B. G phase
- C. G2 phase
- D. M phase

95. The nucleus of a cell ?

- A. Is the region of the cell where ribosomes are degraded
- B. Contains DNA and controls cell activities
- C. Is contained inside the nucleolus
- D. Is surrounded by a single layer of membrane

96. Microtubules, microfilaments and intermediate filaments are components of the ?

- A. Cell wall in plants
- B. Plasma membrane in prokaryotes
- C. Chromosome in eukaryotes
- D. Cytoskeleton

97. Eukaryotic cells have transport vesicles, endoplasmic reticulum, Golgi apparatus and a nuclear envelope. Taken together, all these membranes represent the

- A. Transfer system
- B. Nuclear system
- C. Endomembrane system
- D. Cytoskeletal system

98. Which one of the following is not a function of the plasma membrane ?

- A. Has receptors for chemical messages
- B. Plays a role in signal transduction
- C. Is involved in self-recognition
- D. Is the control center of the cell

99. Which structure is site of the synthesis of proteins that may be exported from the cell ?

- A. Rough ER

- B. Lysosomes
- C. Plasmodesmata
- D. Golgi vesicles

100. Which type of organelle is primarily involved in synthesis of oils, phospholipids, and steroids ?

- A. Ribosome
- B. Lysosome
- C. Smooth endoplasmic reticulum
- D. Mitochondrion