

Entrance Test for Ph.D. Programme-2018

Time: 120 Minutes

Max Marks: 100

Discipline: Computer Science & Engg

Set: A Test ID: 37

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) Keenness 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
Computer Science & Engineering

51. The initial configuration of a queue is a, b, c, d ('a' is in the front). To get the configuration d, c, b, a one needs a minimum of
- A 2 deletions and 3 additions B 3 deletions and 2 additions
C 3 deletions and 3 additions D 3 deletions and 4 additions
52. Which of the following pairs of regular expressions are not equivalent?
- A $1(01)^*$ and $(10)^*1$ B $x(xx)^*$ and $(xx)^*x$
C $(ab)^*$ and a^*b^* D x^+ and x^*x^+
53. The following CFG $S \rightarrow aS \mid bS \mid a \mid b$ is not equivalent to the regular expression
- A $(a^*+b)^*$ B $(a+b)^+$
C $(a+b)(a+b)^*$ D $(a+b)^*(a+b)$
54. Preorder is same as
- A Depth-first order B Breadth-first order
C Topological order D Linear order
55. The average successful search time for sequential search on 'n' items is
- A $n/2$ B $(n-1)/2$
C $(n+1)/2$ D $(n+1)n/2$
56. Any instruction should have at least
- A 2 operands B 1 operand
C 3 operands D None of the above
57. The minimum number of gates required to implement the Boolean function $(AB+C)$ if you use only 2-bit NOR gates?
- A 2 B 3
C 4 D 5
58. The minterm expansion of $f(P,Q,R) = PR+QR'+PR'$
- A $m_2+m_4+m_6+m_7$ B $m_0+m_1+m_3+m_5$
C $m_0+m_1+m_6+m_7$ D $m_2+m_3+m_4+m_5$
59. In 2's complement addition, overflow
- A Is flagged whenever there is carry from sign bit addition B Cannot occur when a positive value is added to negative value
C Is flagged when the carries from sign bit and previous bit match D None of the above

60. Which of the following are the essential prime applicants of the Boolean function?
 $F(a,b,c) = a'c + ac' + bc'$
- | | | | |
|---|-----------------|---|-----------------|
| A | $a'c$ and ac' | B | $a'c$ and $b'c$ |
| C | $a'c$ only | D | ac' and bc' |
61. If integer needs two bytes of storage, then maximum value of an unsigned integer is
- | | | | |
|---|--------------|---|--------------|
| A | $2^{16} - 1$ | B | $2^{15} - 1$ |
| C | 2^{16} | D | 2^{15} |
62. The value of an automatic variable that is declared but not initialised will be
- | | | | |
|---|---------|---|-------------------|
| A | 0 | B | -1 |
| C | garbage | D | None of the above |
63. In C++ a function abc is defined as:

```
void abc(int x=0, int y=0){cout<< x << y;}
```

Which of the following calls is illegal? Assume h, g are declared as integers.
- | | | | |
|---|-----------|---|-------------------|
| A | abc() | B | abc(h) |
| C | abc(h, g) | D | None of the above |
64. Which of the following operator cannot be overloaded?
- | | | | |
|---|----|---|----|
| A | ++ | B | >> |
| C | -- | D | ?: |
65. The target value of an assignment statement should be:
- | | | | |
|---|---------------------------|---|-------------------|
| A | l-value | B | r-value |
| C | either l-value or r-value | D | none of the above |
66. Which normal form is considered adequate for relational database design?
- | | | | |
|---|-----|---|------|
| A | 2NF | B | 3NF |
| C | 4NF | D | BCNF |
67. Given the functional dependencies $X \rightarrow W$; $X \rightarrow Y$; $Y \rightarrow Z$ and $Z \rightarrow PQ$ Which of the following does not hold good?
- | | | | |
|---|--------------------|---|-------------------|
| A | $X \rightarrow Z$ | B | $W \rightarrow Z$ |
| C | $X \rightarrow WY$ | D | None of the above |
68. Which of the following is not a type of dictionary view?
- | | | | |
|---|------|---|-----|
| A | USER | B | ALL |
| C | DBA | D | SYS |

- 79 The topology with the highest reliability is:
- | | |
|--------|--------|
| A Bus | B star |
| C ring | D Mesh |
- 80 Different computers are connected to a LAN by a cable and
- | | |
|-----------------|-------------------|
| A Modem | B interface card |
| C special wires | D telephone lines |
- 81 Which of the following is/ are not assemble directive?
- | | |
|---------|--------|
| A START | B LOAD |
| C END | D BYTE |
- 82 Consider the following macro definition
- ```
macro Add X, Y
 Load Y
 Mul X
 Store Y
End macro
```
- X and Y are:
- |                     |                     |
|---------------------|---------------------|
| A variables         | B identifiers       |
| C actual parameters | D Formal parameters |
83. Which of the following system software resides in main memory always?
- |               |             |
|---------------|-------------|
| A Text Editor | B Assembler |
| C Linker      | D Loader    |
84. Pick the machine dependent phase of compiler
- |                    |                                |
|--------------------|--------------------------------|
| A Syntax analysis  | B Code generation              |
| C Lexical analysis | D Intermediate code generation |
- 85 In which of the following cases, it is possible to obtain different results for call-by-value and call-by-reference parameter passing?
- |                                        |                                           |
|----------------------------------------|-------------------------------------------|
| A Passing an expression as a parameter | B Passing an array as a parameter         |
| C Passing a pointer as a parameter     | D Passing an array element as a parameter |
- 86 In a system, if 5 people are currently using the vi editor, then the number of corresponding processes will be
- |     |     |
|-----|-----|
| A 1 | B 5 |
| C 2 | D 0 |



- 87 Which of the following are not filter programs?  
 A date B sort  
 C cut D Grep
88. Page fault occurs when  
 A The page is corrupted by application software B The page is in main memory  
 C The page is not in main memory D One tries to divide a number by 0
- 89 Dijkstra's banking algorithm in an operating system solves the problem of  
 A Deadlock avoidance B Deadlock recovery  
 C Mutual exclusion D Context switching
- 90 Disk scheduling involves deciding  
 A Which disk should be accessed next B The order in which disk access requests must be served  
 C The physical location where files should be accessed in the disk D None of the above
- 91  $f(x)$  and  $g(x)$  are two functions differentiable in  $[0, 1]$  such that  $f(0) = 2$ ;  $g(0) = 0$ ;  $f(1) = 6$ ;  $g(1) = 2$ ; Then there must exist a constant  $C$  in  
 A  $(0, 1)$ , such that  $f'(C) = 2g'(C)$  B  $[0, 1]$ , such that  $f'(C) = 2g'(C)$   
 C  $(0, 1)$ , such that  $2f'(C) = g'(C)$  D  $[0, 1]$ , such that  $2f'(C) = g'(C)$
- 92 Design phase will usually be  
 A Top-down B Bottom-up  
 C Random D Centre fringing
- 93 If a decision table has 3 variables and 3 rules then  
 A Specification may not be complete B Design could be faulty  
 C Coding will be incorrect D All of the above
- 94 The set of all natural numbers is not closed with respect to  
 A subtraction B division  
 C addition D Subtraction and division
- 95 Let  $S = \{1, 2, 3, 4\}$ . A relation  $R$  defined in  $S$  is as,  $R = \{(1, 2), (4, 3), (2, 2), (2, 1), (3, 1)\}$  is  
 A transitive B symmetric  
 C Anti-symmetric D None of the above

- 96 For a function to be invertible, it has to be
- |                         |                     |
|-------------------------|---------------------|
| A One-one               | B onto              |
| C Both one-one and onto | D None of the above |
- 97 Which of the following methods give the least error when  $e^x$  is integrated from 0 to 0.4
- |                                                  |                                                   |
|--------------------------------------------------|---------------------------------------------------|
| A Trapezoidal rule with the interval width 0.2   | B Trapezoidal rule with the interval width 0.1    |
| C Simpson's 1/3 rule with the interval width 0.1 | D Simpson's rule rule with the interval width 0.2 |
- 98 A group has 11 elements. The number of proper subgroups it can have is
- |     |      |
|-----|------|
| A 0 | B 11 |
| C 5 | D 4  |
- 99 The value of  $\lim_{x \rightarrow 0} x \log x$  is
- |             |            |
|-------------|------------|
| A $-\infty$ | B $\infty$ |
| C 1         | D 0        |
- 100 CFG is not closed under
- |                   |               |
|-------------------|---------------|
| A union           | B Kleene star |
| C complementation | D product     |



