

**M.Sc. III Semester Degree Examination, April / May- 2024****MATHEMATICS****Research Methodology****(NEP)**

Time : 1 Hour

Maximum Marks : 30

**Note :** Answer *all* the questions.

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1. Which one of the following options are the main tasks of research in modern society ? 1
    - (A) To learn new things
    - (B) To keep pace with the advancement in knowledge
    - (C) To systematically examine and critically analyze the investigations/sources with the objective
    - (D) All of the above
  
  2. The format of thesis writing is same as in : 1
    - (A) Writing of seminar representation
    - (B) A research dissertation
    - (C) Preparation of research paper
    - (D) Presenting a workshop/conference paper
  
  3. Which of the following research methodologies is most closely associated with the positivist philosophical framework ? 1
    - (A) Grounded theory
    - (B) Ethnography
    - (C) Experimental research
    - (D) Phenomenological research
  
  4. Which of the following statements accurately describes the relationship between qualitative and quantitative research ? 1
    - (A) Qualitative research is exploratory and inductive while quantitative research is confirmatory and deductive.
    - (B) Qualitative research emphasizes depth and understanding. While quantitative research focuses on breadth and generalization.
    - (C) Qualitative research is primarily concerned with understanding individual experiences, while quantitative research is focused on measuring and comparing variables.
    - (D) Qualitative research is subjective and value-laden, while quantitative research is objective and neutral.



5. Which of the following method is used in empirical researches ? **1**  
(A) Inductive method (B) Deductive method  
(C) Initiative method (D) Scientific method
6. Conference proceedings are considered as \_\_\_\_\_ documents. **1**  
(A) Conventional (B) Primary (C) Secondary (D) Tertiary
7. Web of Sciences is : **1**  
(A) A citation index (B) A bibliography  
(C) An abstracting service (D) All of the above
8. How do you access an article that is freely available ? **1**  
(A) Click the available button (B) Click on the article title  
(C) Google the article (D) There is a list at the bottom of the page
9. Published information in a particular subject area is discussed in : **1**  
(A) Journals (B) Research proposal  
(C) Literature survey (D) All of the above
10. Which one is not an element of a literature review ? **1**  
(A) Headings (B) Introduction  
(C) Body (D) Conclusion
11. NCBI stands for : **1**  
(A) National Center for Botany Information  
(B) National Center for Biotechnology Information  
(C) National Center for Biology Information  
(D) None of these
12. Which statement about hypothesis is not true ? **1**  
(A) It is possible to formulate hypothesis in all situations.  
(B) A hypothesis is an unproven statement or position about a factor or phenomenon that is of interest to the researcher.  
(C) A hypothesis can be descriptive in nature.  
(D) None of these
13. If a researcher has to test a hypothesis whether the difference between the means of two groups is significant, she/he will use : **1**  
(A) Chi-square test (B) Correlation co-efficient  
(C) Sign test (D) Student's t-test
14. \_\_\_\_\_ includes data concerning the family background and educational development. **1**  
(A) General behaviour (B) Case study  
(C) Genetic approach (D) Adequacy



15. A college principal conducts an ethnographic probe into the problems faced by tribal students. Which method of sampling will be most appropriate ? **1**  
(A) Random sampling (B) Stratified sampling  
(C) Cluster sampling (D) Systematic sampling
16. Classroom interaction can be appropriately assessed by : **1**  
(A) Questionnaire (B) Observation schedule  
(C) Interview (D) Test
17. After completing an experiment, all chemical wastes should be : **1**  
(A) Left at your lab station for the next class.  
(B) Disposed off according to your instructor's directions.  
(C) Dumped in the sink  
(D) Taken home.
18. When a sample is chosen because it is available to the researcher, it is known as : **1**  
(A) Probability sampling (B) Systematic sampling  
(C) Convenience sampling (D) Objective sampling
19. Which of the following is called "pearl ash" ? **1**  
(A)  $\text{Na}_2\text{CO}_3$  (B)  $\text{K}_2\text{CO}_3$  (C)  $\text{NaHCO}_3$  (D)  $\text{CaCO}_3$
20. What is pH of lemon juice ? **1**  
(A) 3.8 (B) 5.5 (C) 6.6 (D) 2.5
21. The standard deviation of the width (in cm) of a group of 25 leaves is 0.9 cm. What is the variance of their widths ? **1**  
(A)  $0.81 \text{ cm}^2$  (B)  $0.49 \text{ cm}^2$  (C)  $0.64 \text{ cm}^2$  (D)  $0.23 \text{ cm}^2$
22. Find the variance of 42, 24, 32, 64, 68 ? **1**  
(A) 312.4 (B) 300.8 (C) 306.6 (D) 308.2
23. What is the standard deviation of the given data ? **1**  
3, 8, 4, 5, 9, 13  
(A) 5.12 (B) 2.55 (C) 4.82 (D) 3.41
24. The shape of the normal curve is : **1**  
(A) bell shaped (B) triangular (C) rectangular (D) circular
25. What will be the 't-value' when 'between-groups variance' and 'within-groups variance' is 200 and 50 respectively ? **1**  
(A) 4 (B) 2 (C) 16 (D) 8



26. In regression line, what does Analysis of Variance (ANOVA) calculate ? **1**  
(A) z-score (B) chi-square (C) t-score (D) F-ratio
27. Standard normal distribution has which of the following properties ? **1**  
(A) Mean = variance = 1  
(B) Standard deviation = variance = 0  
(C) Mean = 0, variance = 1  
(D) Mean = standard deviation
28. What is the output of the following Matlab code ? **1**  
t=linspace (0, 3 \* pi)  
p= sin (t) ;  
y=cos (t)  
plot (t, p, t, q) ;  
(A) Error (B) Multiple plots  
(C) graph of a unit circle (D) graph of a sinusoidal
29. To work with chi-square distribution which of the following tool box is necessary **1**  
in Matlab.  
(A) Statistics and Machine learning toolbox  
(B) Control processing toolbox  
(C) Signal processing toolbox  
(D) Mapping toolbox
30. Which one of the following is not a component of MS Excel Chart ? **1**  
(A) Plot area (B) Z-axis (C) Legend (D) Gridlines

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