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| Seat No. | |
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M.Phil./Ph. D. Entrance Examination, September - 2022
ENVIRONMENTAL SCIENCE & ENGINEERING
(FOR M.E./M.Tech STUDENTS)
Sub. Code: 58749

Day and Date : Friday, 23- 09 - 2022**Total Marks : 100****Time : 1.00 p.m. to 3.00 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) Acidity in water is caused due to
 - A) Mineral acids
 - B) Free CO₂
 - C) Iron Sulphate
 - D) All of these
- 2) Biochemical Oxygen Demand (B.O.D.) of safe drinking water must be
 - A) Nil
 - B) 5
 - C) 10
 - D) 15
- 3) The electrostatic precipitator is used to control
 - A) Oxides of Sulphur
 - B) Suspended Particulate matter
 - C) Oxides of Nitrogen
 - D) All of these
- 4) The term “garbage” refers to
 - A) Food waste
 - B) Plastics
 - C) Municipal Waste water
 - D) Ashes

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- 5) If pH value of water is
- A) 7 water it is said to be neutral B) less than 7 it is said to be acidic
C) more than 7 it is said to be alkaline D) all the above
- 6) The common phenomenon of environmental lapse rate is observed in
- A) Stratosphere B) Mesosphere
C) Troposphere D) Ionosphere
- 7) A high velocity of wash water is required for
- A) Rapid Gravity Filter with strainers
B) Rapid Gravity Filter without strainers
C) Slow sand Filter with strainers
D) Slow sand Filter without strainers
- 8) The correct relationship between Total Organic Carbon (TOC), Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) is given by
- A) $TOC > BOD > COD$ B) $TOC > COD > BOD$
C) $COD > BOD > TOC$ D) $BOD > COD > TOC$
- 9) Iron and Manganese can be removed from waters by
- A) Boiling
B) Aeration followed by Coagulation
C) Chlorination
D) Activated carbon addition
- 10) The maximum allowable concentration of iron in water is
- A) 1 ppm B) 0.05 ppm
C) 0.3 ppm D) 0.03 ppm
- 11) Methemoglobinemia is caused due to drinking of water having excess of
- A) Fluorides B) Iron
C) Hardness D) Nitrates

- 12) MPN index is a measure of which of the following
- A) B.O.D.
 - B) Hardness
 - C) D.O Content
 - D) Coliform Bacteria
- 13) The maximum allowable concentration of Lead for domestic supplies
- A) 0.01 ppm
 - B) 0.05 ppm
 - C) 0.5 ppm
 - D) 1 ppm
- 14) The effective size of sand particles for Rapid sand filters varies from
- A) 0.30-0.35 mm
 - B) 0.35-0.5 mm
 - C) 0.50-0.65 mm
 - D) 0.65-0.75 mm
- 15) The Coagulant used for treating sewage is
- A) Alum
 - B) Iron salt
 - C) Chlorinated Copper
 - D) None of these
- 16) Acid Rain may occur
- A) Equally in all regions
 - B) Predominantly in arid regions
 - C) Predominantly in tropical regions
 - D) Predominantly temperate regions
- 17) What does super saturation of a water body with DO cause?
- A) Eutrophication
 - B) Gas bubble disease in fish
 - C) Methaemoglobinemia
 - D) Endemic goiter
- 18) Sound pressure level (dB) can be expressed as
- A) $20 \log_{10} (\text{Reference pressure}/\text{Measured pressure})$ 0.5
 - B) $20 \log_{10} (\text{Reference pressure}/\text{Measured pressure})$
 - C) $20 \log_{10} (\text{Measured pressure}/\text{Reference pressure})$ 0.5
 - D) $20 \log_{10} (\text{Measured pressure}/\text{Reference pressure})$
- 19) A Grit Chamber having higher detention period is called
- A) Grit basin
 - B) Detritus tank
 - C) Vaccuator
 - D) Grit Channel

- 20) Air Binding may occur in
A) Sewers
B) Artesian well
C) Aerator
D) Filters
- 21) Period of Cleaning Slow sand filter is about
A) 24 to 48 hours
B) 10 to 12 days
C) 1 to 3 months
D) 1 to 2 years
- 22) Trickling filters are used to remove
A) Suspended solids
B) Colloidal solids
C) Organic matter
D) Pathogenic bacteria
- 23) Which type of Plume may occur during winter nights
A) Looping
B) Inversion
C) Coning
D) Lofting
- 24) Which one of the following methods can be employed for plastic and rubber waste disposal
A) Incineration
B) Composting
C) Pyrolysis
D) Sanitary Landfill
- 25) The pH of fresh sewage is usually
A) Less than 7
B) More than 7
C) Equal to 7
D) Equal to Zero
- 26) What do you consider as the main aim of inter disciplinary research.
A) To bring out holistic approach to research
B) To reduce the emphasis of single subject in research domain
C) To over simplify the problem of research
D) To create a new trend in research methodology
- 27) One of the aims of scientific method in research is to
A) Eliminate spurious relation
B) Improve data interpretation
C) Confirm triangulation
D) Introduce new variables

- 28) The depth of any research can be judged by
- A) Title of the research
 - B) Total expenditure on research
 - C) Duration of research
 - D) Objectives of research
- 29) The First step of reserch is
- A) Identification of Problem
 - B) Searching a Problem
 - C) Selecting a Problem
 - D) Finding a Problem
- 30) Research can be conducted by a person who
- A) Holds a Postgraduate degree
 - B) Has studied Research Methodology
 - C) Possesses Reasoning ability
 - D) Is a Hard worker
- 31) Fundamental research reflects the ability to
- A) Synthesis new ideas
 - B) Expound new principles
 - C) Evaluate the existing materials
 - D) Study the existing research regarding various topics
- 32) Bibliography given in a research project
- A) Helps those interested in further research
 - B) Has no relevant to research
 - C) Shows vast knowledge of researcher
 - D) All of these
- 33) To test Null Hypothesis, a researcher uses
- A) T test
 - B) ANOVA
 - C) X2
 - D) Factorial Analysis
- 34) A ratio represents the relation between
- A) Part and part
 - B) Part and Whole
 - C) Whole and whole
 - D) All the above

- 35) We use Factorial Analysis
- A) To know the relationship between two variables
 - B) To test the hypothesis
 - C) To know the difference between two variables
 - D) To know the difference among many variables
- 36) Generalized Conclusion on the basis of a sample is technically known as
- A) Data analysis and interpretation
 - B) Parameter inference
 - C) Statistical inference
 - D) All the above
- 37) Field Work based research is classified as
- A) Empirical
 - B) Historical
 - C) Experimental
 - D) Biographical
- 38) When a research problem is related on heterogeneous population, the most suitable sampling method is
- A) Cluster sampling
 - B) Stratified sampling
 - C) Convenient sampling
 - D) Lottery Method
- 39) The research that applies the laws at the time of field study to draw more and more clear ideas about the problem is
- A) Applied research
 - B) Experimental Research
 - C) Action Research
 - D) None of these
- 40) How can the objectivity of the research be enhanced
- A) Through its impartiality
 - B) Through its reliability
 - C) Through its Validity
 - D) All of these
- 41) The Process not needed in the experimental research is
- A) Manipulation and replication
 - B) Observation
 - C) Controlling
 - D) Content Analysis
- 42) The Research is Always
- A) Verifying the old knowledge
 - B) Exploring new knowledge
 - C) Filling the gap between knowledge
 - D) All of these

- 43) Research is
A) Searching again and again
B) Finding solution to any Problem
C) Working in a scientific way to search for truth of any problem
D) None of the above
- 44) Which one of the following is not a source of data
A) Population data
B) GIS
C) Census
D) Administrative records
- 45) Research is considered not ethical if
A) Tries to prove a particular point
B) Does not ensure privacy of the respondent
C) Does not investigate the data scientifically
D) Is not of very high standard
- 46) Newton gave three basic laws of motion
A) Descriptive research
B) Sample survey
C) Fundamental Research
D) Applied research
- 47) A research paper is a brief report of reserch work based on
A) Primary data only
B) Secondary data Only
C) Primary and secondary data only
D) None of these
- 48) Workshops are meant for
A) Giving Lectures
B) Multiple target groups
C) Showcase new theories
D) Hands on training/experience
- 49) A hypothesis is a
A) Law
B) Postulate
C) Canon
D) Supposition
- 50) Controlled group condition is applied in
A) Survey research
B) Historical research
C) Experimental Research
D) Descriptive research



Rough Work