

Seat No.	
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M.Phil/Ph.D. Entrance Examination, September - 2019
CIVIL ENGINEERING (For M.E., M. Tech. Students)

Day and Date : Thursday, 19 - 09 - 2019**Total Marks : 100****Time : 10.00 a.m. to 12.00 noon**

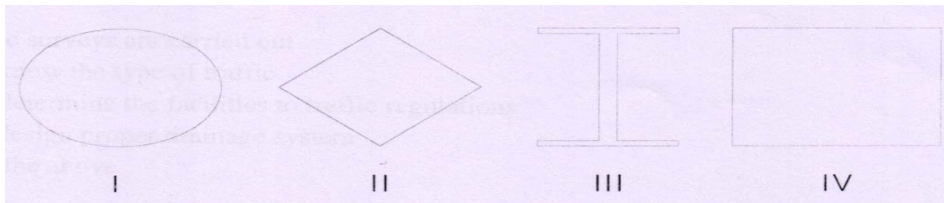
- Instructions :**
- 1) All questions are compulsory.
 - 2) Each question carries 2 marks.
 - 3) Answers should be marked in the given OMR answer sheet by darkening the appropriate option.
 - 4) Use black ball point pen only for marking the circle. Do not make any stray mark on the OMR Answer Sheet.
 - 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. Elastic structural analysis makes use of
 - A) Linear stress — strain relation only
 - B) Elasticity only
 - C) Elastic and linear stress — strain relation
 - D) Elastic but either linear or no linear stress strain relation

2. Due to certain temperature increase, the rise if the three hinged arch increased by 1%. The horizontal thrust will then
 - A) increase by 1%
 - B) decrease by 1%
 - C) no change
 - D) none of these

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3. The moment at intermediate support of a two-span continuous beam of 6 m each with simple support at the ends carrying a udl of 20 kN/m over the left span is (EI same)
- A) 60 kN-m hogging B) 45 kN-m hogging
C) 45 kN-m sagging D) 0 kN-m
4. Minimum pitch of transverse reinforcement in a column is
- A) the least lateral dimension of member
B) sixteen times the smallest diameter of longitudinal reinforcement bar to be tied
C) forty-eight times the diameter of transverse reinforcement.
D) lesser of above three values
5. The four cross sections shown below are required to be ordered in the increasing order of their respective shape factor



Which of the following order is correct?

- A) III. I. IV. II B) I. II. III. IV
C) III, IV. I. II D) III. IV. II. I
6. Properties of flow net is/are
- A) Flow lines are perpendicular to equipotential lines.
B) No two flow lines or equipotential lines start from same point
C) No two flow lines cross each other
D) All above

7. Negative skin friction on a pile under vertical compressive load acts
- A) downward and increases the load carrying capacity of pile.
 - B) downward and decreases the load carrying capacity of pile.
 - C) upward and increases the load carrying capacity of pile.
 - D) downward and maintains the load carrying capacity of pile.
8. Following is a component of ecosystem
- A) Abiotic substances
 - B) Producers
 - C) consumers
 - D) All of the above
9. IS 10500:2012 for drinking water quality is
- A) 0 NTU
 - B) 1 NTU
 - C) 5 NTU
 - D) 10 NTU
10. Following method is used for softening of hard water
- A) Boiling
 - B) Lime-Soda
 - C) Ion exchange
 - D) All of the above
11. The role of Environmental Engineer is
- A) Water conservation
 - B) Environmental protection
 - C) Forestation
 - D) All of the above
12. For type I settling, particle removal is independent of
- A) Surface area of basin
 - B) Depth of basin
 - C) Detention time
 - D) Density of particles

- 13.** Pavement is said to be flexible if it contains
- A) water bound macadam surface
 - D) stabilized soil base constructed of lime cement or tar
 - C) bitumen-bound stone layer of varying aggregates
 - D) all the above
- 14.** Traffic surveys are carried out
- A) to know the type of traffic
 - B) to determine the facilities to traffic regulations
 - C) to design proper drainage system
 - D) all the above
- 15.** The type of transition curves generally provided on hill roads, is
- A) circular
 - B) cubic parabola
 - C) Lemniscates
 - D) spiral
- 16.** The network in which the analysis is wider and less rigidly structured is
- A) PERT Network
 - B) CPM Network
 - C) Decision Network
 - D) None of Above.
- 17.** Identify which of the following does not represent an activity
- A) Foundation excavation is being done
 - B) Masonry work up to plinth is being done
 - C) Site leveling is completed
 - D) Concreting of foundation is being done

18. Dimensions of surface tension are
- A) $ML^{\circ}T^{-2}$ B) $ML^{\circ}T$
C) MLr^2 D) ML^2T^2
19. A ship whose hull length is 100 m is to travel at 10 m/sec. For dynamic similarity, at what velocity should a 1:25 model be towed through water?
- A) 10 m/sec B) 25 m/sec
C) 2 m/sec D) 50 m/sec
20. The hydraulic mean depth for a circular pipe of diameter (d) is
- A) $d/6$ B) $d/4$
C) $d/2$ D) d
21. If Δ is the depth of water in metres. B is the number of days of base period and D is the duty in hectare/cumec. the relationship which holds good. is
- A) $D = \Delta \frac{8.64D}{B}$ B) $B = \Delta \frac{8.64D}{D}$
C) $D = \frac{8.64\Delta}{B}$ D) $\Delta = \frac{8.64B}{D}$
22. In a syphon aqueduct
- A) Drainage passes over the canal and F.S.L. of the canal is below the bottom of the drainage trough
B) Drainage passes over the canal and F.S.L. of the canal is above the bottom of the drainage trough
C) Canal passes over the drainage and H.F.L of the drainage is above the bottom of the canal trough
D) Canal passes over the drainage and H.F.L of the drainage is below the bottom of the canal trough

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23. Using Newton-Raphson method. find a root correct to three decimal places of the equation $x^3 - 3x - 5 = 0$

A) 2.275

B) 2.279

C) 2.222

D) None of these

24. For a binomial distribution, if p is probability of success and q is probability of failure then

A) $p = q = 1/2$

B) $p + q = 1$

C) $pq = 1$

D) $p + q = 0$

25. Rank of the matrix $A =$

$$\begin{vmatrix} 0 & 0 & 0 & 0 \\ 4 & 2 & 3 & 0 \\ 1 & 0 & 0 & 0 \\ 4 & 0 & 3 & 0 \end{vmatrix}$$

A) 1

B) 2

C) 3

D) 4

26. Which of the set of activities best indicate the cyclic nature of action research strategy.

A) Reflect, Observe, Plan, Act

B) Observe, Act, Reflect, plan

C) Act, Plan, Observe, Reflect

D) Plan, act, Observe, Reflect

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- 27.** In which of the following arrangements a wider spectrum of ideas and issues may be made possible.
- A) Research article
 - B) Workshop mode
 - C) Conference
 - D) Symposium
- 28.** The First step of research is.
- A) Identification of Problem
 - B) Searching a Problem
 - C) Selecting a Problem
 - D) Finding a Problem
- 29.** The issue of research ethics may be considered pertinent at which stage of research.
- A) At the stage of problem formulation and its definition
 - B) At the stage of defining the population of research
 - C) At the stage of data collection and interpretation
 - D) At the stage of reporting the findings
- 30.** 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
- 31.** Which of the following is an initial mandatory requirement for pursuing research?
- A) Developing a research design
 - B) Formulating a research question
 - C) Deciding about the data analysis procedure
 - D) Formulating a research hypothesis

- 32.** A ratio represents the relation between.
- A) Part and part
 - B) Part and Whole
 - C) Whole and whole
 - D) All the above
- 33.** Which of the following statements is not true in the context of participatory research?
- A) It recognizes knowledge as power
 - B) It emphasizes on people as experts
 - C) It is a collective process of enquiry
 - D) Its sole purpose is production of knowledge
- 34.** To test Null Hypothesis. a researcher uses.
- A) T test
 - B) ANOVA
 - C) X²
 - D) Factorial Analysis
- 35.** Which of the following are the characteristics of a seminar.
- a. It is form of academic instruction
 - b. It involves questioning, discussion and debates
 - c. It involves large group of individuals
 - d. It needs involvement of skilled persons
- Select correct answer from the codes given below
- A) b and c
 - B) b and d
 - C) c. b. and d
 - D) a. b and d

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36. A researcher is interested in studying the prospects of a particular political party in an urban area. What tool should he prefer for the study
- A) Rating Scale
 - B) Interview
 - C) Questionnaire
 - D) Schedule
37. Ethical norms in research do not involve guidelines for.
- A) Thesis Format
 - B) Copyright
 - C) Patenting policy
 - D) Data sharing policies
38. A definition that has a meaning that is deliberately assigned to some symbol is called.
- A) Lexical
 - B) Persuasive
 - C) Stipulative
 - D) Precising
39. A cluster of propositions with a structure that exhibits some inference is called
- A) An inference
 - B) An argument
 - C) An expansion
 - D) A Valid argument
40. 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

- 41.** 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
- 42.** Which one of the following is not a source of data.
- A) Population data
 - B) GIS
 - C) Census
 - D) Administrative records
- 43.** 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
- 44.** Newton gave three basic laws of motion.
- A) Descriptive research
 - B) Sample survey
 - C) Fundamental Research
 - D) Applied research
- 45.** Which of the following is susceptible to the issue of research ethics.
- A) Inaccurate application of statistical technique
 - B) Faculty research design
 - C) Choice of sampling technique
 - D) Reporting of research findings

- 46.** In qualitative research paradigm, which of the following features may be considered critical.
- A) Data collection with standardized research tool
 - B) Sampling design with probability sample techniques
 - C) Data collection with bottom-up empirical evidences
 - D) Data gathering to take with top down systematic evidences
- 47.** Which of the following is an initial mandatory requirement for per suing research
- A) Developing a research design
 - B) Formulating a research question
 - C) Deciding about the data analysis procedure
 - D) Formulating a research hypothesis
- 48.** Controlled group condition is applied in.
- A) Survey research
 - B) Historical research
 - C) Experimental Research
 - D) Descriptive research
- 49.** Field Work based research is classified as.
- A) Empirical
 - B) Historical
 - C) Experimental
 - D) Biographical
- 50.** The format of the thesis is same as in.
- A) Preparation of research paper
 - B) Writing of seminar presentation
 - C) A research dissertation
 - D) Presenting a workshop



Rough Work