| Seat No. | |
|---|---|

# M.Phil./Ph.D. Entrance Examination, October - 2021
# CIVIL ENGINEERING

**Day and Date : Tuesday, 26/10/2021**　　　　　　　　　　**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) 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

2) 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

3) 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

*P.T.O.*

**4)**  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

**5)**  To test Null Hypothesis, a researcher uses

(A)  T test

(B)  ANOVA

(C)  X2

(D)  Factorial Analysis

**6)**  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

**7)**  Hypothesis which explain relationship between two variables is

(A)  casual

(B)  rational

(C)  descriptive

(D)  tentative

**8)**  Observation is a physical and _____ activity

(A)  mental

(B)  social

(C)  psychological

(D)  personal

**9)**  One of the aims of scientific method in research is to

(A)  eliminate spurious relation

(B)  Improve data interpretation

(C)  Confirm triangulation
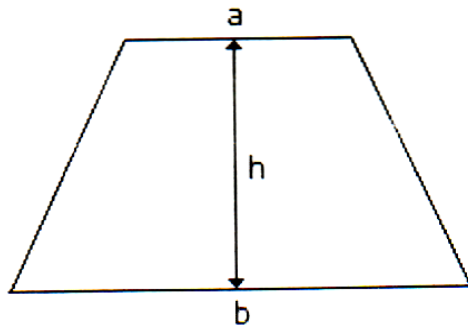
(D)  Introduce new variables

10) Which one of the following is a non-probability sampling
   (A) Simple Random        (B) Purposive
   (C) Systematic           (D) Stratified

11) When planning to do a social research, it is better to
   (A) Approach the topic with an open mind
   (B) Do a pilot study before getting stuck into
   (C) Be familiar with the literature on the topic
   (D) Forget about theory as it is practical

12) A definition that has a meaning that is deliberately assigned to some symbol is called
   (A) Lexical              (B) Persuasive
   (C) Stipulative          (D) Precising

13) A thesis statement is
   (A) An observation       (B) A Fact
   (C) An assertion         (D) A discussion

14) 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

15) Which of the following is an example of primary data?
   (A) Book                 (B) Journal
   (C) News paper           (D) Census report

16) In survey there is an enumerator and a _____
   (A) Guide                (B) respondent
   (C) supervisor           (D) messenger

**17)** The first variable is _____ variable

   (A) Abstract                  (B) dependent

   (C) Separate                 (D) independent

**18)** A hypothesis is a

   (A) Law                      (B) Postulate

   (C) Canon                   (D) Supposition

**19)** The depth of any research can be judged by

   (A) ATitle of the research

   (B) Total expenditure on research

   (C) Duration of research

   (D) Objectives of research

**20)** 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

**21)** _____ is a quality of good researcher

   (A) Scientific Temper        (B) Age

   (C) Money                 (D) Time

**22)** Action Research is

   (A) An applied research

   (B) A Longitudinal research

   (C) A research carried out to solve immediate problems

   (D) All the above

23) The conclusion of which type of research cannot be generalized to other situations
   (A) Historical research
   (B) Descriptive research
   (C) Experimental research
   (D) Casual comparative research

24) Sampling cases means
   (A) Sampling using sampling frame
   (B) Identifying people who are suitable for research
   (C) Literally the researcher's brief case
   (D) Sampling of people, newspaper etc.

25) What is a research design?
   (A) A way of conducting research that is not grounded in theory
   (B) Choice between Quantitative and Qualitative methods
   (C) The style in which you present your research findings
   (D) A framework for every stage of collection and analysis of data

26) When a body is placed over a liquid, it will sink down if
   (A) Gravitational force is equal to the up-thrust of the liquid
   (B) Gravitational force is less than the up-thrust of the liquid
   (C) Gravitational force is more than the up-thrust of the liquid
   (D) None of the above

27) The length of the divergent cone in a Venturimeter is _____ that of the convergent cone.
   (A) Equal to                    (B) Double
   (C) Three to four times          (D) Five to six times

**28)** Reynolds number is significant in

(A) Supersonics, as with projectile and jet propulsion

(B) Full immersion or completely enclosed flow, as with pipes, aircraft wings, nozzles etc.

(C) Simultaneous motion through two fluids where there is a surface of discontinuity, gravity forces, and wave making effect, as with ship's hulls

(D) All of the above

**29)** The error in discharge (*dQ/Q*) to the error in measurement of head (*dH/H*) over a rectangular notch is given by

(A) $dQ/Q = (1/2) \times (dH/H)$

(B) $dQ/Q = (3/4) \times (dH/H)$

(C) $dQ/Q = (dH/H)$

(D) $dQ/Q = (3/2) \times (dH/H)$

**30)** The station where observations are not made, but the angles at the station are used in triangulation series, is known as

(A) Satellite station

(B) Subsidiary station

(C) Pivot station

(D) Main station

**31)** The line of collimation method of reduction of levels, does not provide a check on

(A) Intermediate sights

(B) Fore sights

(C) Back sights

(D) Reduced level

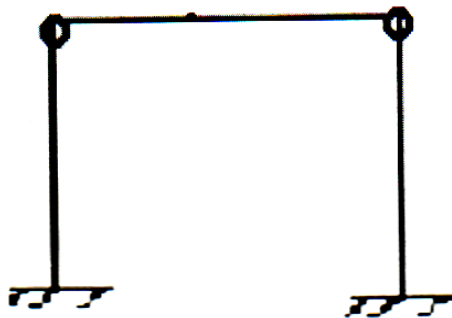32) The centre of gravity of the trapezium as shown in below figure from the side is at a distance of



(A) $(h/3) \times [(b + 2a)/(b + a)]$

(B) $(h/3) \times [(2b + a)/(b + a)]$

(C) $(h/2) \times [(b + 2a)/(b + a)]$

(D) $(h/2) \times [(2b + a)/(b + a)]$

33) Three forces which act on a rigid body to keep it in equilibrium. The forces must be coplanar and

(A) Concurrent                    (B) Parallel

(C) Concurrent parallel           (D) None of these

34) The term _____ is used to mean the external views as seen from certain rooms of the building.

(A) Aspect                        (B) Prospect

(C) Elegance                      (D) Roominess

35) In the two-pipe system for the drainage of buildings, the discharge from the waste pipe is disconnected from the drain by using _____

(A) Gully trap                    (B) Silt trap

(C) Floor trap                    (D) Grease trap

**36)** Strength of concrete is proportional to _____

    (A) Sand content             (B) Water cement ratio

    (C) Aggregate ratio           (D) Cement water ratio

**37)** Maximum size of aggregates should not be larger than _____

    (A) 1/3 the thickness of a slab

    (B) 1/2 the thickness of a slab

    (C) 1/1 the thickness of a slab

    (D) 1/4 the thickness of a slab

**38)** What is the compaction factor for low degree of workability?

    (A) 0 .78                  (B) 0.85

    (C) 0 .92                  (D) 0.95

**39)** Calculate design wind speed for a site in a city with basic wind speed of 50 m/s, risk coefficient =1, topography factor = 1, terrain is with closely spaced buildings and height of building (class A) = 15m.

    (A) 40 m/s               (B) 48.5 m/s

    (C) 50 m/s               (D) 52.5 m/s

**40)** Determine the effective net area for angle section ISA $100 \times 75 \times 12$ mm, when 100mm leg is connected to a gusset plate using weld of length 140mm.

    (A) 1795 mm2          (B) 1812 mm2

    (C) 1956 mm2          (D) 2100 mm2

**41)** The reduction of carbon dioxide by cascade aerators is in the range of _____

    (A) 10-20%              (B) 20-30%

    (C) 40-50%              (D) 50-60%

**42)** Which air pollutant cause corrosion of building?

(A) $SO_2$

(B) $SO_3$

(C) CO

(D) $NO_2$

**43)** Rise of water table above the ground surface causes

(A) Equal increase in pore water pressure and total stress

(B) Equal decrease in pore water pressure and total stress

(C) Increase in pore water pressure but decrease in total stress

(D) Decrease in pore water pressure but increase in total stress

**44)** The average coefficient of permeability of natural deposits

(A) Parallel to stratification is always greater than that perpendicular to stratification

(B) Parallel to stratification is always less than that perpendicular to stratification

(C) Is always same in both directions

(D) Parallel to stratification may or may not be greater than that perpendicular to stratification

**45)** In a consolidated drained test on a normally consolidated clay, the volume of the soil sample during shear

(A) Decreases

(B) Increases

(C) Remains unchanged

(D) First increases and then decreases

**46)** The design of horizontal and vertical alignments, super elevation, gradient is worst affected by _____

(A) Length of vehicle

(B) Width of vehicle

(C) Speed of vehicle

(D) Height of vehicle

47) The main purpose of providing camber is _____
    (A) To collect storm water
    (B) To maintain equilibrium
    (C) To follow IRC specifications
    (D) To follow geometric specifications

48) Which of the below is not an item to be included while considering the annual highway cost?
    (A) Administration                (B) Highway maintenance
    (C) Tax levied                       (D) Salvage value

49) To convert indeterminate structure to a determinate structure, number of force release to be provided equals to _____
    (A) Number of equilibriums equations for the respective structures available
    (B) External Static Indeterminacy only
    (C) Internal Static Indeterminacy only
    (D) Static Indeterminacy

50) The following structure is _____



    (A) Stable                       (B) Statically Unstable
    (C) Geometrically Unstable       (D) Internally Unstable

⊖⊖⊖

**Rough Work**

**Rough Work**