PUNJAB TECHNICAL UNIVERSITY
JALANDHAR

Max. Marks: 90 **Time: 90 Mins.**

Entrance Test for Enrollment in Ph.D. Programme

Important Instructions

- ***Fill all the information in various columns, in capital letters, with blue/black ball point pen.***
- ***Use of calculators is not allowed. Use Blue/Black ball point pen for attempting the questions.***
- ***All questions are compulsory. No negative marking for wrong answers.***
- ***To attempt a question, make a tick mark (√) at the right option/answer.***
- ***Each question has only one right answer.***
- ***Questions attempted with two or more options/answers will not be evaluated.***

Stream *(Engg./Arch./Pharm./Mgmt./App.Sci./Life Sci.)* **Engineering**

Discipline **Civil Engineering**

Name .....

Father's Name .....

Roll No. ..... Date: **15-01-2011**

Signature of Candidate .....

Signature of Invigilator .....

Q. 1 One of the essential characteristics of research is

(a) Generalizability

(b) Usability

(c) Objectivity

(d) Repilcability

Q. 2 A good research always begins with

(a) An original idea

(b) Preparation of the plan & design for study

(c) Study of relevant research methodology

(d) Study of what research others has done

Q. 3 A research problem is feasible only when

(a) It is researchable

(b) It is new

(c) It has some utility

(d) All of the above

Q. 4 A researcher selects a probability sample of 100 out of the total population. It is

(a) Random sampling

(b) Cluster Sampling

(c) Systematic Sampling

(d) None of the above

Q. 5 An investigator studied the census data for a given area and prepared a write up based on them. Such a write-up is called

(a) Research Paper

(b) Article

(c) Thesis

(d) Research Report

Q. 6 For accuracy, researcher should

(a) Increase the sampling

(b) Unbiased

(c) Keep the variance high

(d) All the above

Q. 7 Hypothesis can not stated in

(a) Clear Terms

(b) Logical terms

(c) Simple terms

(d) Question form

Q. 8 A good hypothesis should be

(a) Precise, specific and consistent with most known facts

(b) Of limited scope and should not have general or global significance

(c) Tested by the given data

(d) All of the above

Q. 9 Research is done for

(a) Interest in research

(b) Knowledge of research techniques

(c) Experience in conducting research

(d) Interest in the discipline concerned

Q. 10 The main aim of research should be to

(a) Study the existing literature in a field

(b) Generate new principles and theories

(c) Synthesize the ideas given by others

(d) Evaluate the findings of a study

Q. 11 The Government of India conducts Census after every 10 years. The method of research used in this process is

(a) Case Study

(b) Developmental

(c) Survey

(d) Experimental

Q. 12 An academic association assembled at one place to discuss the progress of its work and future plans. Such an assembly is known as a

(a) Conference

(b) Workshop

(c) Seminar

(d) Symposium

Q. 13 The role of National Board of Accreditation is to

(a) Sanction funds for projects

(b) Ensure quality assurance in technical education

(c) Grant affiliation

(d) Grant approval

Q. 14 The expansion of NPTEL is

(a) National Program on Technology Enhanced Learning

(b) National Project on Technology Enabled Learning

(c) National Program for Technical Education Learning

(d) National Project for Technician Education Learning

Q. 15 National Assessment and Accreditation Council, has been established by

(a) AICTE

(b) UGC

(c) ISTE

(d) NBA

Q. 16 The historical research is different from experimental research in the process of

(a) Replication

(b) Formulation of hypothesis

(c) Hypothesis testing

(d) All of the above

Q. 17 Which of the following is the most essential characteristic of a research worker

(a) Sympathy

(b) Open mindedness

(c) Patience

(d) Emotional control

Q. 18 If in a research independent variables cannot be manipulated then it is known as

(a) Experimental Research

(b) Non-experimental Research

(c) Fundamental Research

(d) Exploratory Research

Q. 19 Which TV channel is exclusively dedicated to engineering & technical education

(a) Gyan Darshan

(b) Vyas

(c) Eklavya

(d) Kisan

Q. 20 ICT stands for

(a) Information Common Technology

(b) Information & Communication Technology

(c) Information & Computer Technology

(d) Inter Connected Technology

Q. 21 An ideal fluid is one

(a) Which obeys Newton's Law of Viscosity

(b) Frictionless and incompressible

(c) Very viscous

(d) Frictionless and compressible

Q. 22 One kilo-Pascal is equivalent to

(a) 1 N/mm^2

(b) 1000 N/m^2

(c) 1000 N/mm^2

(d) 1000 N/cm^2

Q. 23 Stream lines and path lines always coincide in case of

(a) Steady Flow

(b) Laminar Flow

(c) Uniform Flow

(d) Turbulent Flow

Q. 24 Equation of continuity is based on the principle of conservation of
(a) Mass
(b) Energy
(c) Momentum
(d) None of the above

Q. 25 Which is the best hydraulic section of the following open channel cross sections
(a) Rectangle
(b) Triangle
(c) Trapezoidal
(d) Semi-circle

Q. 26 The most common device used for measuring discharge through channels is
(a) Venturi flume
(b) Current meter
(c) Pitot tube
(d) Water meter

Q. 27 Which of the following scales is largest one
(a) 1 cm = 50 m
(b) 1 : 42000
(c) R.F. = 1/300000
(d) 1 cm = 50 km

Q. 28 Geodetic surveying is different from plane surveying because of
(a) Undulations of the topography
(b) Large difference of elevation between points
(c) The curvature of earth
(d) Coverage of very large area

Q. 29 A building is an obstacle to
(a) Chaining but not ranging
(b) Ranging but not chaining
(c) Both chaining and ranging
(d) Neither chaining nor ranging

Q. 30 A level line is
(a) Horizontal line
(b) Parallel to mean spheriodal surface of earth
(c) Joining points of equal elevation
(d) All the above

Q. 31 Benchmark is established by
(a) Hypsometry
(b) Barometric levelling
(c) Spirit levelling
(d) Trignometrical levelling

Q. 32 Bowditch rule is applied to
(a) An open traverse for graphical adjustment
(b) A closed traverse for adjustment of closing error
(c) Determine the effect of local attraction
(d) None of the above

Q. 33 For a Tacheometer the additive and multiplying constants are respectively
(a) 0 and 100
(b) 100 and 0
(c) 100 and 10
(d) 10 and 1000

Q. 34 If the degree of a curve is 1^{o} then radius of curve is equal to
(a) 860 m
(b) 1720 m
(c) 5400 m
(d) 3440 m

Q. 35 Agonic line is the line joining points having
(a) Zero declination
(b) Minimum declination
(c) Maximum declination
(d) Same declination

Q. 36 Hydrograph is the graphical representation of
(a) Stream discharge and time
(b) Groundwater flow and time
(c) Rainfall intensity and time
(d) None of the above

Q. 37 The water stored in the reservoir below the minimum pool level is called
(a) Useful storage
(b) Dead storage
(c) Valley storage
(d) Surcharge storage

Q. 38 The elementary profile of a dam is
(a) A rectangle
(b) A trapezoidal
(c) An equilateral triangle
(d) A right angled triangle

Q. 39 A water shed canal
(a) Irrigates only on one side
(b) Is most suitable in hilly areas
(c) Avoids the cross-drainage works
(d) Is aligned parallel to the contours of the area

Q. 40 Wetted perimeter of a regime channel for a discharge of 64 cumecs as per Lacey's theory is

(a) 19 m

(b) 38 m

(c) 57 m

(d) 76 m

Q. 41 A land is known as waterlogged when

(a) Permanent wilting point is reached

(b) Gravity drainage has ceased

(c) Capillary fringe reaches the root zone of plants

(d) None of the above

Q. 42 A unit hydrograph has one unit of

(a) Rainfall duration

(b) Rainfall excess

(c) Time base of direct runoff

(d) Discharge

Q. 43 Camber in the road is provided for

(a) Effective drainage

(b) Counteracting the centrifugal force

(c) Proper sight distance

(d) Centre line marking

Q. 44 The maximum design gradient for vertical profile of the road is termed as

(a) Exceptional gradient

(b) Limiting gradient

(c) Ruling gradient

(d) Minimum gradient

Q. 45 The maximum width of vehicle permitted on Indian roads as per IRC recommendations is

(a) 1.85 m

(b) 2.44 m

(c) 3.81 m

(d) 4.72 m

Q. 46 On a single lane road with two way traffic, the minimum stopping sight distance is equal to

(a) Stopping distance

(b) Two times the stopping distance

(c) Half the stopping distance

(d) Three times the stopping distance

Q. 47 The maximum limit of superelevation for mixed traffic in plain terrain is

(a) 1 in 15

(b) 1 in 12.5

(c) 1 in 10

(d) Equal to camber

Q. 48 The maximum number of vehicles beyond which the roundabout does not function efficiently is

(a) 500 vehicles per hour

(b) 1000 vehicles per day

(c) 5000 vehicles per hour

(d) 10000 vehicles per day

Q. 49 The IRC method of Design of flexible pavements is based upon

(a) Group index method

(b) Benkelman beam method

(c) Westergaard method

(d) CBR method

Q. 50 The maximum spacing of contraction joints in rigid pavements is

(a) 2.5 m

(b) 3.5 m

(c) 4.5 m

(d) 5.5 m

Q. 51 The standard length of rail for Broad Gauge is

(a) 12 m

(b) 18 m

(c) 13 m

(d) 25 m

Q. 52 Sleeper density in India is normally kept as

(a) M+2 to M+7

(b) M to M+2

(c) M+5 to M+10

(d) M

Where M is the rail length in meters

Q. 53 To determine the modulus of rupture, the size of test specimens used is

(a) 150 x 150 x 500 mm

(b) 100 x 100 x 700 mm

(c) 150 x 150 x 700 mm

(d) 100 x 100 x 500 mm

Q. 54 The compressive strength of 100 mm cube as compared to 150 mm cube is always

(a) Less

(b) More

(c) Equal

(d) All of the above

Q. 55 Poisson's ratio for concrete

(a) Remains constant

(b) Increases with richer mixes

(c) Decreases with richer mixes

(d) None of the above

Q. 56 According to IS:456, minimum slenderness ratio for a short column is

(a) Less than 12

(b) Less than 18

(c) Between 18 and 24

(d) More than 24

Q. 57 According to IS:456, the maximum reinforcement in a column should be limited to

(a) 8 %

(b) 2 %

(c) 4 %

(d) 6 %

Q. 58 Minimum thickness of a load bearing RCC wall should be equal to

(a) 5 cm

(b) 10 cm

(c) 15 cm

(d) 20 cm

Q. 59 The purpose of reinforcement in pre-stressed concrete is to

(a) Provide adequate bond stress

(b) Resist tensile stresses

(c) Impart initial compressive stress in concrete

(d) All of the above

Q. 60 Minimum water cement ratio required for full hydration of cement is equal to

(a) 0.23

(b) 0.36

(c) 0.45

(d) 0.60

Q. 61 In limit state design method, the limiting value of depth of neutral axis is (d = eff. depth)

(a) 0.53 d

(b) 0.48 d

(c) 0.45 d

(d) 0.43 d

Q. 62 Endurance limit of mild steel is approximately equal to

(a) 0.3

(b) 0.5

(c) 0.7

(d) 0.8

Q. 63 The heaviest I-section for same depth is

(a) ISMB

(b) ISLB

(c) ISHB

(d) ISWB

Q. 64 As per IS: 800, the maximum deflection in a beam should not exceed

(a) L/180

(b) L/250

(c) L/325

(d) L/360

Q. 65 A circular column section of steel is generally not used in actual practice because

(a) It is difficult to connect beams to the round sections

(b) It is uneconomical

(c) It can not carry the load safely

(d) All of the above

Q. 66 The maximum slenderness ratio of a steel column, the design of which is governed by wind or seismic forces is

(a) 350

(b) 180

(c) 150

(d) 250

Q. 67 Which of the following sections should preferably be used at places where torsion occurs

(a) Angle section

(b) Channel section

(c) Box type section

(d) None of the above

Q. 68 Which of the following sections will have largest shape factor
(a) Rectangular
(b) I-section
(c) Solid circular section
(d) Diamond

Q. 69 The number of independent equations to be satisfied for static equilibrium of a plane structure is
(a) 1
(b) 3
(c) 5
(d) 7

Q. 70 In Column Analogy method of structural analysis, the area of an analogous column for a fixed beam of span L and flexure rigidity EI is taken as
(a) L/EI
(b) L/2EI
(c) L/3EI
(d) L/4EI

Q. 71 Which of the following methods of structural analysis is a displacement method
(a) Moment distribution method
(b) Column analogy method
(c) Three moment equation
(d) None of the above

Q. 72 The deformation of a spring produced by a unit load is called
(a) Stiffness
(b) Flexibility
(c) Influence coefficient
(d) Unit strain

Q. 73 The phenomenon of decreased resistance of a material to reversal of stress is called
(a) Plasticity
(b) Resilience
(c) Creep
(d) Fatigue

Q. 74 Impact test is conducted to estimate the property of
(a) Hardness
(b) Toughness
(c) Strength
(d) Elasticity

Q. 75 Modulus of rigidity is defined as the ratio of
(a) Longitudinal stress to longitudinal strain
(b) Shear stress to shear strain
(c) Stress to strain
(d) Stress to volumetric strain

Q. 76 If a material has identical properties in all directions, it is said to be
(a) Homogeneous
(b) Elastic
(c) Isotropic
(d) Orthotropic

Q. 77 Which of the following sedimentary rocks changes into quartzite by metamorphic action
(a) Sand stone
(b) Lime stone
(c) Shale
(d) Gypsum

Q. 78 Crushing Strength of a first class brick should not be less than
(a) 50 Kg/cm^2
(b) 75 Kg/cm^2
(c) 105 Kg/cm^2
(d) 150 Kg/cm^2

Q. 79 The main ingredients of Ordinary Portland Cement are
(a) Lime and silica
(b) Lime and alumina
(c) Silica and alumina
(d) Lime and iron

Q. 80 The bearing capacity of a water logged soil can be improved by
(a) Compacting the soil
(b) Draining the soil
(c) Increasing the depth of foundation
(d) Grouting

Q. 81 A soil has bulk density of 22 kN/m^3, and water content 10%. The dry density of soil is
(a) 18.6 kN/m^3
(b) 20.0 kN/m^3
(c) 22.0 kN/m^3
(d) 23.2 kN/m^3

Q. 82 Which of the following is a measure of soil particle size range

(a) Effective size

(b) Coefficient of curvature

(c) Uniformity coefficient

(d) None of the above

Q. 83 According to IS classification, the size range of silt particles is

(a) 4.75 mm to 2.00 mm

(b) 2.00 mm to 0.425 mm

(c) 0.425 mm to 0.075 mm

(d) 0.075 mm to 0.002 mm

Q. 84 Phreatic line in an earthen dam is

(a) Straight line

(b) Parabolic

(c) Circular

(d) Elliptical

Q. 85 Time factor for a clay layer is

(a) Directly proportional to permeability of soil

(b) A dimensional parameter

(c) Inversely proportional to drainage path

(d) Independent of thickness of clay layer

Q. 86 Mechanical stabilization of soil is done with the help of

(a) Cement

(b) Lime

(c) Bitumen

(d) Proper grading

Q. 87 PERT technique of network analysis is mainly useful for

(a) Small projects

(b) Large and complex projects

(c) Research and development projects

(d) Deterministic activities

Q. 88 The process of incorporating changes and re-scheduling or re-planning is called

(a) Resource levelling

(b) Updating

(c) Resource smoothing

(d) Critical path scheduling

Q. 89 If the average daily consumption of water of a city is 100,000 m^3, the maximum daily consumption on peak hourly demand will be

(a) 100,000 m^3

(b) 150,000 m^3

(c) 180,000 m^3

(d) 270,000 m^3

Q. 90 The maximum permissible limit for fluoride in drinking water is

(a) 0.1 mg/litre

(b) 1.5 mg/litre

(c) 5 mg/litre

(d) 10 mg/litre