UPSEE 2019

PAPER-CE: CODE AA*

ANSWER KEY, Examination Date: 21-04-2019

1	C	26	C	51	C	76	B
2	A	27	B	52	B	77	D
3	A	28	D	53	C	78	C
4	C	29	A	54	C	79	C
5	D	30	C	55	C	80	C
6	C	31	B	56	D	81	C
7	B	32	D	57	D	82	A
8	A	33	D	58	B	83	C
9	D	34	C	59	C	84	A
10	B	35	B	60	C	85	C
11	D	36	A	61	D	86	C
12	B	37	B	62	B	87	B
13	B	38	B	63	D	88	C
14	A	39	A	64	C	89	B
15	B	40	D	65	B	90	B
16	B	41	D	66	D	91	D
17	B	42	B	67	D	92	A
18	A	43	A	68	B	93	B
19	A	44	B	69	D	94	A
20	B	45	C	70	D	95	A
21	D	46	D	71	B	96	B
22	C	47	C	72	D	97	D
23	B	48	A	73	A	98	C
24	A	49	B	74	C	99	A
25	D	50	A	75	B	100	D

Note: **In case of any grievance, it must be reported at upseegrievance@aktu.ac.in along with Students Roll No. with Paper Code, Question Booklet Code, Question No. and suggested answer with supporting documents on or before 03rd May 2019.**

*प्रश्न पुस्तिका क्रमांक **AA** का प्रश्नपत्र एवं कुंजी प्रकाशित की जा रही है। प्रश्न पुस्तिका क्रमांक **BB, CC** तथा **DD** में प्रश्नों एवं उनके विकल्पों का क्रम परिवर्तित है कृपया तद्नुसार उत्तर मिलान करें।

CE

Question Booklet Sr. No.

Q. Booklet Code

AA

Roll No.

OMR Answer Sheet No.

Declaration :
I have read and understood the instructions given on page No. 1

Signature of Candidate
as signed in application)

Seal of Superintendent of Examination Centre

Signature of the Invigilator

Name of Candidate :

To be copied by the candidate in your own handwriting in the space given below for this purpose is compulsory.
"You will know you are in the right profession when : you wake anxious to go to work, you want to do your best daily, and you know your work is important."

*** After cutting half upper part of this page, invigilator preserve it along with student's OMR sheet.**

No. of Pages in Booklet including title	**16**	Time **2** Hours	Marks **400**	No. of Questions in Booklet	**100**

CE

Question Booklet Sr. No.

Roll No.

Signature of the Invigilator

Q. Booklet Code

AA

Name of Candidate :

INSTRUCTIONS TO CANDIDATE

1. Use BLUE or BLACK BALL POINT PEN only for all entries and for filling the bubbles in the OMR Answer Sheet.
2. Before opening the SECURITY SEAL of the question booklet, write your Name, Roll Number (In figures), and OMR Answer-sheet Number in the space provided at the top of the Question Booklet. Non-compliance of these instructions would mean that the Answer Sheet can not be evaluated leading the disqualification of the candidate.
3. Each question carries FOUR marks. There will be negative marking on wrong answer. FOUR marks will be awarded for each correct answer and ONE mark will be deducted for each wrong answer. No marks will be deducted/awarded for unattempted questions.
4. Each multiple choice question has only one correct answer. More than one answer indicated against a question will be treated as incorrect answer.
5. Use of log table, mobile phones, any electronic gadget and slide rule etc. is strictly prohibited. Non-programmable calculator is permitted.
6. Candidate will be allowed to leave the examination hall at the end of examination time period only.
7. If a candidate is found in possession of books or any other printed or written material from which he/she might derive assistance, he/she is liable to be treated as disqualified. Similarly, if a candidate is found giving or obtaining (or attempting to give or obtain) assistance from any source, he/she is liable to be disqualified.
8. OMR sheet is placed within this paper and can be taken out from this paper but seal of paper must be opened only at the start of paper.
9. This booklet contains TWO Sections, Section A (Aptitude & Mathematics) has 30 Questions to be attempted and Section B (Subject domain) has 70 Questions to be attempted.

CE

Section - A :
General Aptitude : Q. 1 to Q. 15
Mathematics : Q. 16 to Q. 30

Section - B :
Civil Engineering : Q. 31 to Q. 100

001. Antonym of word "Dissent" is:
(A) Renounce (B) Adopt
(C) Agree (D) Give

002. Synonym of work "Impudent" is:
(A) Insolent (B) Partial
(C) Bankrupt (D) Restive

003. Find out which part of the sentence has an error. If there is no mistake, the answer is 'No error'
(A) I have seen
(B) that film last year
(C) but I do not remember its story
(D) No error

004. Chose the correct meaning of the phrase "To get into hot water":
(A) To be impatient
(B) To suffer huge financial loss
(C) To get into trouble
(D) To be in confused state of mind

005. Find out the word with correct spelling:
(A) Brassere (B) Brissiere
(C) Brasiiere (D) Brassiere

006. The value of 25-5 [2+3{2-2(5-3)+5}-10]÷4 is

(A) 5 (B) 23.25

(C) 23.75 (D) 25.75

007. If the sum of a number and its square is 182, what is the number?

(A) 12 (B) 13

(C) 28 (D) 91

008. The sum of the ages of a father and his son is 45 years. Five years ago, the product of their ages was 34. The ages of the son and the father are respectively:

(A) 6 and 39 (B) 7 and 38

(C) 9 and 36 (D) 11 and 34

009. A number, when 35 is subtracted from it, reduces to its 80%. What is four fifth of that number?

(A) 70 (B) 90

(C) 120 (D) 140

010. If the ratio of areas of two circles is 4:9 then the ratio of their circumstances will be:

(A) 3:2 (B) 2:3

(C) 4:9 (D) 9:4

011. Army is related to Soldier as Galaxy is related to:

(A) Planet (B) Satellite

(C) Meteor (D) Star

012. IGH:TRS::?:KIJ

(A) POQ (B) QOP

(C) OPQ (D) QPO

013. '1+2+3' stands for the 'the brave boy' '2+3+4' stands for 'brave boy swims' '1+2+4+5' stands for 'the brave girl swims'. What stand for 'brave'?

(A) 1 (B) 2

(C) 3 (D) 4

014. Manipulate the symbol and find the missing number.

If 3*6=18

4*7=22

9*1=20

then 5*2 =?

(A) 14 (B) 10

(C) 7 (D) 3

015. In a row of children, Kamal is sixth from the left and Appu is fourth from the right. When Kamal and Appu exchange positions, Appu becomes seventeenth from the right. Which will be Kamal's position from the left?

(A) Twentieth

(B) Nineteenth

(C) Twenty-first

(D) Seventh

M. Tech.: Part A-(ii) Mathematics

016. If $A=\begin{bmatrix}3 & -3 & 4\\ 2 & -3 & 4\\ 0 & -1 & 1\end{bmatrix}$, then

(A) $A^2=A^{-1}$ (B) $A^3=A^{-1}$

(C) $A^4=A^{-1}$ (D) $A^5=A^{-1}$

where A^{-1} is the inverse matrix of A.

017. The rank of the matrix

$$A=\begin{bmatrix}1 & 1 & -1 & 1\\ -1 & 1 & -3 & -3\\ 1 & 0 & 1 & 2\\ 1 & -1 & 3 & 3\end{bmatrix}$$ is

(A) 1 (B) 2

(C) 3 (D) 4

018. If $A=\begin{bmatrix}1 & 0 & 0\\ 1 & 0 & 1\\ 0 & 1 & 0\end{bmatrix}$ then for every integer n ≥3

(A) $A^n=A^{n-2}+A^2-I$

(B) $A^n=A^{n-2}-A^2+I$

(C) $A^n=A^{n-3}+A^2-I$

(D) $A^n=A^{n-3}-A^2-I$

where I is the identity matrix of order 3.

019. $\lim\limits_{x\to 0} x\sin\frac{1}{x}=$

(A) 0 (B) 1

(C) ∞ (D) $-\infty$

020. If $f(x)=\begin{cases}\dfrac{x\left(e^{\frac{1}{x}}-e^{\frac{1}{x}}\right)}{\left(e^{\frac{1}{x}}+e^{\frac{1}{x}}\right)}, x\neq 0\\ 0, x=0\end{cases}$, *then*

(A) f is continuous and derivable at $x=0$

(B) f is continuous but not derivable at $x=0$

(C) f is discontinuous at $x=0$

(D) f is derivable everywhere.

021. The sum of the serie

$1-\frac{1}{2^2}+\frac{1}{3^2}-\frac{1}{4^2}+....,$ is equal to

(A) $\frac{\pi^2}{4}$ (B) $\frac{\pi^2}{6}$

(C) $\frac{\pi^2}{8}$ (D) $\frac{\pi^2}{12}$

022. The general solution of the partial differential equation

$\left(\frac{y-z}{yz}\right)\frac{\partial z}{\partial x}+\left(\frac{z-x}{zx}\right)\frac{\partial z}{\partial y}=\frac{x-y}{xy}$, is

(A) $\phi(xyz, x^2+y^2+z^2)=0$

(B) $\phi(xyz, xy+yz+zx)=0$

(C) $\phi(xyz, x+y+z)=0$

(D) $\phi(xyz, x^2y+y^2z+z^2x)=0$

023. A unit vector normal to the surface $x^3+y^3+3xyz=3$ at the point *(1,2,-1)* is

(A) $\frac{\hat{i}+3\hat{j}+2\hat{k}}{\sqrt{14}}$ (B) $\frac{-\hat{i}+3\hat{j}+2\hat{k}}{\sqrt{14}}$

(C) $\frac{\hat{i}+2\hat{j}+3\hat{k}}{\sqrt{14}}$ (D) $\frac{-\hat{i}+2\hat{j}+3\hat{k}}{\sqrt{14}}$

024. The vector field defined by

$\vec{F} = (x + 2y + az)\hat{i} + (bx - 3y - z)\hat{j} + (4x + cy + 2z)\hat{k}$

is irrotational, if

(A) $a=4, b=2, c=-1$

(B) $a=4, b=-2, c=1$

(C) $a=1, b=2, c=4$

(D) $a=-1, b=4, c=2.$

025. The value of $\oint_c \left(x^2 + xy\right)dx + \left(x^2 + y^2\right)dy$ where C is the square formed by the lines $y = \pm 1, x = \pm 1$, is equal to

(A) 2π (B) 2

(C) 1 (D) 0

026. The only solution of the differential equation $x\frac{dy}{dx} - \frac{1}{2}y = x + 1$ for which x and y can attain the value unity is given by

(A) $y = 2x - \sqrt{x} + 2$

(B) $y = 2x + \sqrt{x} + 2$

(C) $y = 2x - \sqrt{x} - 2$

(D) $y = 2x + \sqrt{x} - 1$

027. The Laplace transform of $e^x x^{\frac{1}{2}}$ is

(A) $\frac{x}{\sqrt{s-1}}$ (B) $\frac{\sqrt{\pi}}{\sqrt{s-1}}$

(C) $\frac{\sqrt{\pi}}{\sqrt{s+1}}$ (D) $\frac{\pi}{\sqrt{s+1}}$

028. A die is tossed thrice. A success is getting *1* or *6* on a toss. Then the mean of the number of success is

(A) $\frac{1}{2}$

(B) $\frac{1}{3}$

(C) $\frac{2}{3}$

(D) 1

029. A manufacturer knows that the condensers he makes contain on an average 1% of defectives. He packs them in boxes of 100. The probability that a box picked at random will contain 4 or more faulty condensers is

(A) $1 - \frac{8}{3e}$

(B) $1 - \frac{3}{8e}$

(C) $1 - \frac{4}{3e}$

(D) $1 - \frac{3}{4e}$

030. The order of convergence of Newton Raphson method is

(A) 0 (B) 1

(C) 2 (D) 3

031. The rate of change of velocity and the rate of change of momentum of a moving body respectively are

(A) acceleration and impulse

(B) acceleration and force

(C) displacement and force

(D) force and displacement

032. In the equation of virtual work, which of the following force is neglected?

(A) reaction at any smooth surface with which the body is in contact

(B) reaction of rough surface of a body which rolls on it without shipping

(C) reaction at a point on an axis fixed in space, around which a body is constrained to turn

(D) all the above

033. A simply supported beam with span 6 m has a rectangular cross section with depth 350 mm. If it is to be loaded centrally with a concentrated load of 30 kN. The width required at a distance 2 m from end for uniform strength of 8 n/mm^2 is

(A) 176 mm

(B) 167 mm

(C) 192 mm

(D) 184 mm

034. A circular shaft was subjected to torsion initially and then subjected to a bending moment. If the maximum bending stress and maximum torsional shear stress had same value, ratio of torque applied to bending moment is

(A) 1/2

(B) 3/4

(C) 2

(D) 3/2

035. A cantilever beam span length 6 m is loaded by a weight 'W' at the free. The deflection at the free end is observed to be 1.8 cm. The slope of the beam at the free end in radian will be

(A) 0.045

(B) 0.0045

(C) 0.45

(D) 45 x 10^{-5}

036. A fixed beam AB is subjected to a triangular load varying from zero at B w per unit length at end A. The ratio of fixed end moment at B to A will be

(A) 2/3

(B) 3/2

(C) 1/2

(D) 1/3

037. Which of the following statements are correct?

I. The stiffness coefficient k_{ji} indicates force at j and a unit deformation at i.

II. Stiffness matrix is a square symmetric matrix.

III. Stiffness matrix is possible for both stable and unstable structures also.

(A) I, II, III are correct

(B) I, II are correct

(C) I, III are correct

(D) II, III are correct

038. U_1 and U_2 are the strain energies stored in a prismatic bar due to axial tensile force W_1 and W_2 respectively. The strain energy U stored in the same bar due to combined action of W_1 and W_2 is

(A) $U = U_1 U_2$

(B) $U > U_1 + U_2$

(C) $U < U_1 + U_2$

(D) $U = U_1 + U_2$

039. A three hinged parabolic arch is subjected to uniformly distributed load of 10 kN/m over its entire span. At any section, the arch is subjected to

I. normal thrust

II. shear force and normal thrust

III. bending moment

IV. shear force and bending moment

Which of these statements is/are correct?

(A) only I (B) II and III

(C) only II (D) only IV

040. Modular bricks are of nominal size 20 x 10 x 10 cm and 20% of the volume is lost in mortar between joints. Then what is the number of modular bricks required per cubic meter of brick work?

(A) 520

(B) 500

(C) 485

(D) 470

041. Consider the following statements regarding the addition of pozzolanas to cement causes

I. increase in strength.

II. less heat hydration.

III. decrease in workability.

The true statements are

(A) I, II, III are correct

(B) I and II are correct

(C) I and III are correct

(D) only II is correct

042. The probability distribution taken to represent the completion time in PERT analysis is

(A) gamma distribution

(B) normal distribution

(C) beta distribution

(D) log-normal distribution

043. The minimum tension reinforcement in RC beam to be provided to

(A) prevent sudden failure.

(B) arrest crack width.

(C) control excessive deflection.

(D) prevent surface hair cracks.

044. In the design of a reinforced concrete beam, the requirement for bond is not getting satisfied. The economical option to satisfy the requirement for bond is by

(A) bundling of bars.

(B) providing smaller diameter bars more in number.

(C) providing larger diameter bars less in number.

(D) providing same diameter bars more in number.

045. The factored load carrying capacity of a column of 300 mm x 599 mm size with minimum percentage of steel is (take M20 and Fe415)

(A) 1234 kN

(B) 1468 kN

(C) 1524 kN

(D) 1632 kN

046. For prestressed structural members, high strength concrete is used primarily because

(A) both shrinkage and creep are more.

(B) shrinkage is less but creep is more.

(C) modulus of elasticity and creep values are higher.

(D) high modulus of elasticity and low creep.

047. Which of the following are subjected to primary torsion?

(A) isolated L-beam

(B) ring beam of circular water tank

(C) (A) and (B)

(D) grid system

048. In a steel plate with bolted connection, the rupture of the net section is a mode of failure under

(A) tension

(B) compression

(C) flexure

(D) shear

049. For a steel built-up column subjected to an axial force of 1500 kN, the lacing system is to be designed for resisting transverse shear of

(A) 75 kN

(B) 37.5 kN

(C) 50 kN

(D) 25.5 kN

050. Intermediate vertical stiffeners are provided in plate girders to

(A) eliminate web buckling.

(B) eliminate local buckling.

(C) transfer concentrated loads.

(D) prevent excessive deflection.

051. As per IS:800-2007 the cross section in which extreme fibre can reach the yield stress but cannot develop the plastic moment of resistance due to local buckling is defined as

(A) plastic section

(B) compact section

(C) semi-compact section

(D) shear section

052. Width of roadway of two lane national highways in mountainous and steep terrain is

(A) 6.25 m

(B) 8.8 m

(C) 4.75 m

(D) 9. 0 m

053. The minimum value of 15 minutes peak hour factor on a section of road is

(A) 0.10

(B) 0.20

(C) 0.25

(D) 0.33

054. Base course is used in rigid pavement for

(A) Prevention of subgrade settlement

(B) Prevention of slag cracking

(C) Prevention of pumping

(D) Prevention of thermal expansion

055. The standard plate size in a plate bearing test for finding modulus of sub grade reaction (K) value is

(A) 100 cm diameter

(B) 50 cm diameter

(C) 75 cm diameter

(D) 25 cm diameter

056. The road geometrics in India are designed for the

(A) 98^{th} highest hourly traffic volume

(B) 85^{th} highest hourly traffic volume

(C) 50^{th} highest hourly traffic volume

(D) 30^{th} highest hourly traffic volume

057. Which of the following set of terms does not relate to operation of a theodolite?

(A) transiting and inverting

(B) face left and face right

(C) right swing and left swing

(D) gauging and sounding

058. Which of the following errors is more severe in plane table surveying?

(A) defective sighting

(B) defective orientation

(C) movement of board between sights

(D) non-horizontality of board when points sighted are at large differences of their elevation

059. The long and short sides of a rectangular measure are 9.32 m and 4.82 with errors ±5 mm, express the area of correct number of significant figures

(A) 44.98 mm^2

(B) 44.96 mm^2

(C) 44.92 mm^2

(D) 44.85 mm^2

060. Tilt in tachometric survey increase the intercept, if it is

(A) away from the telescope pointing up the hill

(B) towards the telescope pointing up the hill

(C) away from the telescope down the hill

(D) none of these

061. For a chord of 60 m, the mid ordinate for a circular curve of 50 m radius will be

(A) 10 m

(B) 12.5 m

(C) 15 m

(D) 18.75 m

062. The unsupported vertical cut of the embankment,

if $C = 40\ kN/m^2$, $\gamma = 30\ kN/m^3$, $K_a = 1$, is

(A) 5.23 m

(B) 5.33 m

(C) 5.43 m

(D) 5.53 m

063. The bearing capacity factors Nc, Nq and Nγ are function of

(A) width and depth of footing

(B) density of soil

(C) cohesion of soil

(D) angle of internal friction of soil

064. Cohesionless soils are formed due to

(A) oxidation

(B) hydration

(C) physical disintegration

(D) chemical decomposition

065. Westergaard's theory is applicable for which type soils?

(A) sandy soils

(B) saturated soils

(C) humus soils

(D) gravel

066. For a saturated cohesive soil, a triaxial test yields the angle of internal friction (ϕ) as zero. The conducted test is

(A) consolidated drained test

(B) consolidated undrained test

(C) unconfined compression test

(D) unconsolidated undrained test

067. The predominant mineral responsible for shrinkage and swelling in black cotton soil is

(A) illite

(B) kaolinite

(C) mica

(D) montmorillonite

068. The shape of clay particle is usually

(A) angular

(B) flaky

(C) tubular

(D) rounded

069. The liquid limit and plastic limit exist in

(A) Sandy soil

(B) Silty soil

(C) Gravel soil

(D) Clay soil

070. Mechanical stabilization of soil is done with the help of

(A) cement

(B) lime

(C) bitumen

(D) proper grading

071. Hardness of water is caused by the presence of which of the following in water?

(A) chlorides and sulphates

(B) calcium and magnesium

(C) nitrites and nitrates

(D) sodium and potassium

072. Aeration of water is done to remove

(A) suspended impurities

(B) colour

(C) dissolved salts

(D) dissolved gases

073. MPN index is a measure of one of the following

(A) coliform bacteria

(B) BOD_5

(C) dissolved oxygen contain

(D) hardness

074. The minimum dissolved oxygen which should be present in water in order to save aquatic life is

(A) 1 ppm

(B) 3 ppm

(C) 4 ppm

(D) 6 ppm

075. During temperature inversion in atmosphere, air pollutants tend to

(A) accumulate above inversion layer

(B) accumulate below inversion layer

(C) disperse laterally

(D) disperse vertically

076. The method of refuse disposal, involving burial in trenches, is called

(A) incineration

(B) composting

(C) pulverisation

(D) none of these

077. Two biodegradable components of municipal solid waste are

(A) plastics and wood

(B) cardboard and glass

(C) leather and tin cans

(D) food waste and garden trimmings

078. Two primary pollutants are

(A) sulphur oxide and ozone

(B) nitrogen oxide and peroxyacetylnitrate

(C) sulphur oxide and hydrocarbon

(D) ozone and peroxyacetylnitrate

079. A trickling filter is designed to remove

(A) settleable solids

(B) colloidal solids

(C) dissolved organic matters

(D) none of these

080. Chlorine is sometimes used in sewage treatment

(A) to avoid flocculation

(B) to increase biological activity of bacteria

(C) to avoid buckling of activated sludge

(D) to help in grease separation

081. Compare the value of the bulk modulus of elasticity of an incompressible fluid with that of a compressible fluid.

(A) both are the same

(B) the values of both are zero

(C) it is greater

(D) it is smaller

082. Name the type of flow, if (dV/ds) = 0

(A) uniform flow

(B) non-uniform flow

(C) steady flow

(D) unsteady flow

083. The compressibility of fluid is inversely proportional to

(A) Young's modulus of elasticity

(B) modulus of rigidity

(C) bulk modulus

(D) Reynolds number

084. What is the relationship between absolute viscosity and dynamic viscosity?

(A) both are the same

(B) one is the reciprocal of the other

(C) ratio of two is equal to g

(D) none of the above

085. An inverted U-tube manometer is more sensitive than an upright manometer because

(A) the height of levels is greater.

(B) the manometric fluids are heavier than working fluids.

(C) the manometric fluids are lighter than working fluids.

(D) None of these

086. A fine grained soil has liquid limit of 60 and plastic limit of 20. As per plasticity chart, according IS classification, the soil is represented by letter symbols

(A) CL (B) CI

(C) CH (D) CL – ML

087. An open ended steel barrel of 1 m height and 1 m diameter is filled with saturated fine sand, having coefficient of permeability of 10^{-2} m/s. The barrel stands on saturated bed gravel. The required for the water level in the barrel to drop by 0.75 m is

(A) 58.9 s (B) 75 s

(C) 100 s (D) 150 s

088. In a Darcian flow, the flow velocity is

(A) actual velocity

(B) seepage velocity

(C) discharge velocity

(D) boundary velocity

089. The depth of flow in an alluvial channel is 1.5 m. If critical velocity ratio is 1.1 and Manning's constant n = 0.018, the critical velocity of channel as per Kennedy's theory is

(A) 0.713 m/s

(B) 0.784 m/s

(C) 0.879 m/s

(D) 1.108 m/s

090. A soil has a bulk density of 22 kN/m^2 and water content 10%. The dry density of soil is

(A) 15 kN/m^2

(B) 20 kN/m^2

(C) 30 kN/m^2

(D) 40 kN/m^2

091. The identical clay samples of the same size, designated as A and B are subject to consolidation tests under identical loading conditions. Drainage takes place through one face in sample A and through both the face in sample B. 50% consolidation of sample A occurs in 10 minutes. The time required for 50% consolidation to occur in sample B will be:

(A) 12.5 minutes

(B) 10 minutes

(C) 7. 5 minutes

(D) 2.5 minutes

092. The natural void ratio of saturated clay strata 3 m thick is 0.90. The final void ratio of the clay at the end of consolidation is expected to be 0.71. The total consolidation settlement of the clay strata is

(A) 300 mm

(B) 275 mm

(C) 200 mm

(D) 175 mm

093. Due to rise in temperature, the viscosity and unity weight of percolating fluid are reduces to 70% and 90% respectively. Other things being constant, the change in coefficient of permeability will be

(A) 20%

(B) 28.6%

(C) 63.0%

(D) 77.8%

094. If the elevation of hydraulic grade line at the junction of three pipes is above the elevation of reservoirs B and C and below the reservoir A, then the direction of flow will be

(A) from reservoir A to reservoirs B and C

(B) from reservoir B to reservoirs A and C

(C) from reservoir C to reservoirs B and A

(D) unpredictable

095. A square footing is to be proportioned on a cohesionless soil with an average N value of 42. The allowable bearing pressure of this footing will be governed by

(A) General shear failure

(B) Local shear failure

(C) Progressive failure

(D) Settlement criteria

096. Which of the following velocity potentials satisfies the continuity equation?

(A) x^2y (B) x^2-y^2

(C) Cos x (D) x^2+y^2

097. The following assumption is not made for the friction circle method of slope stability analysis

(A) Friction fully not mobilized

(B) Total stress analysis is applicable

(C) The resultant is tangential to the friction circle

(D) None of these.

098. Echo sounder is used to measure

(A) Width of river

(B) Velocity of flow

(C) Peak flow

(D) all of the above

099. Stream lines and path lines always coincides in case of

(A) Steady flow (B) Laminar flow

(C) Uniform flow (D) Turbulent flow

100. A fully saturated clay sample is subjected to a pressure of 200kN/m^2, in the consolidation test. After a period of time when the average pore pressure is 60 kN/m^2, the degree of consolidation is

(A) 10 (B) 30

(C) 40 (D) 70

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