CIVIL ENGINEERING

ONE MARKS QUESTIONS

1. An axiaLly loaded bar is subjected 'to a normal stress or 173 M Pa The shear stress in the bar is
   a. 75 Ml'a
   b. 86.5 MPa
   c. f00 MPa
   d. 122.3 MPn

   A steel column, pinned. at both ends, has a buckling load of 200 kN. If the, column IS restrained against lateral movement ru its mid-height us buckling load will. be
   a. 200kN
   b. 183l<N
   c, J{)() kN
   d. 8iKl kN

3, For an isotropic material. the relarlonship between the Young-s modulus (11). shear modulus (d)and PQisson's ratio (f.l.)'s ~11'euljy

   q, r,– 2(1+11)
   b. e C; 2(l+,u)
   c. a (l+:l,u)
   d. a– E 2(1-,u)

-l. The stiffness coefficieru k. indicates
   -a forceat r due to a unit deformation at]
   11 defOrmation at] due to a unit rorce 01. i
   c. defcnuatien at i due to a unit force nlj
   d. force atJ due to a unit deformaucn ai,

.5, /\ cJar soil Sample is tested iii a tnaxial apparatus iii consolidated- drained coeditions at ll cell pressure Of 1ffi)kNfol! What 11'1lhe the pore water pressure at 0 devlator stress elf ~akN/n'l;>"
   a. ()kN/m'!
   b. 20kN/lll
   c. 4UkN/m!
   it. 6UkN/m'

   the number of blows observed in a Standard Penetrauon Test (SPT) for differesn penetration depths are given a' follows:

Penetratien vf sa mllier	Numb~1'uf t>lo",~
0-1500101.	(
l5tl- 31101llm	
30U - 4SUml11	10

   the observed N value ls
   a. K
   b. 14
   c. R
   d. 2<1

7 The vertical stress at some dep.th below Ihe comer of a 2m)(3m rectangular looting due to a certain load intenshv is 100 kN/m:. Wha~ \\~lJ be the yemell stress in kN/llll below the centre of a 4111 • (,m rectangular footing lll the same depth and same-lead ,ntlllS'ty'/
   l|. 25
   b 100
   c. 200
   d. ~l)(l

   the presence or hardness In excess or permissible limit causes
   a cardio vasculer problems
   h. skin dlscotournuon
   c. calcium deficiency
   d. increased laundry expenses

   The dispersion of pollutants in aunosphere Is maxunum when
   a. environmental lapse nile JS greater Ihan adiabatic lapse rate
   b, environmental lapse rate is less than adiabntio lapse-rate
   c. environmental lapse rate is '~llulJl ro adiabatic lapse rate
   d. maximum nuxing deplh IS equal to

10, The alkalinily and the hardness of a water sample are 2SQ mg/l and)SO lll,yl a~ CaC0;1, respectively , the water has
   a 35L) mglll;8!bonatc hardness and zero non-carbonate hardness

b. 250 mgtlCMbolt3t" hardne", and zero non-carbonate hardness

o. 25() mgll carbonnte hanlm:sS lind 350 m!!ll nun-ClIrM,ull" harM"S~

,I. 250 rug/I carbonate bardness ami 100 mg/I non-carbonate J""d_8

II 1111:consumptive usc of water lor ~ crop (luring a particular stage. of gJ:Oi<th I" 2.(1 mm/day. The maximum depth of avtlll.ble; wak.'r in the root ZOne is 60 mm. lrrig_atioJl is required when the amount ll" o""il.l>l., I\.I<T ii(50-.. uf the m"l(i'~um .v-iJ!h1e-water io Q,c rOt,1 lOne. 11rc:que,ncy oj' lrrigntion ~lıould be

~. 1l)<l.y.

h. 15 days

c. 20 day.

,I. 25 d.y.

12. As per the Lace)". method f0l" de!lign of ..Uuvial channels, idenliJy !It" TRVS statement riom thefolJowin8:

ll. Weued perimeter ilc:N"scs with lin increase in dc~i.£n dischni'g&z.

h. lfydr.ulic r:lai". in",'CnHl,\l< Il ith an in~"""c in silt J;'elor

e. Wcu"" perimeter decreases whh an [ncreaae ill dcsig_n discharg«,

d. Wened penmeter increases lllll an Increase. in silt factor.

13. 'D", cQnsislancy and 110w resistance of bitumen can be determined from which or the I"I)llIIIIIg!

n. ()~Clmly 1"'11

b. Penetration rest

c. SOn':flln~ polnl test

(L Vt,cosiiy leSl

14. [j'.• [wu-I.no Nnlional Highw.y and a lwo-lane SIDle Iligll\\ ay inle,'S."1 ,II right nngles. Ihe number o(pOtt:ooli.1 canniet l'0'nL. 01. the inlers.oliDo, assuming: lJ.:ll both the road\ are IWO-I-~'yIs

a. 11

b. 17

c. 24

'I. 32

15. In signal. design as per Indian Road. Congress specifications, if the sum of the ratios of normal flow. 10 saruratien flbW of two directional tf1lJlio flow is O.~O and the tOlal lost time per cycle 1£10 seconds. the optimum cycle lenglh in s""and~ .~

n, 100

b. 50

c, 60

d. 40

16. There J, ~fire .)verl;'11 ol tho end of o long IIII"Il .h.lIuoL For-3 given 11"" nll~ lil critical.depfh i. IctlS than Ih"lIornl~1 depfb, What' gr.duoUy varied, flow pt'OJilo will oecur in Ihe channel ft1r this l1ol~ role:!

a, M,

b. M,

c, M;

tL S,

11. .-\l two points 1 and [redacted]in .. pipeline the velocities nre V nnd iV I'cclivoly. Both the points are .1 tlie ..arne el""ation; The fluid density is p. '[lle flow can be essumed 10 be iacompresslble, In viscid. steady Dud irrotatlonal, The ilifOl'Cuoo in prcS-"'l'CS 1'1 and I', nt

a. 0,5 "V[1]

b, L5 pV'

c. 2 flV-•

d_ 3 pyl

18. The minimum and Il,,, maximum eigen vulue. of the matrix are- -2 and G. reSpectivel)' Whol i. the other eigen vDlud?

•. 5

b, 3

e, I

d, -I

19. The degree of fbe ~iffc:",oli,,1 elLuaGoD

,I x 1 ~ .= O. is 4/'

a, 0

b, 1

c. 2

d. '3

2(1. The ~t)lutio" f'r Ihe clifferenri.' equation : : x!J' with the condirron Ih31

I' = I at x - 0 is

a, y=eI

b. In(,v)~3 x'/14

c. InLI')<;~ /2

d. I'~jJI

TWO MARKS QUESTIONS

Zf. II m~!11bur of length IU()mm is inserted between two rigid supports, and its temperature. is increased b) IO·C. If !he cl,effloiqnt or thermal expansion Is 12 ~ IIt"pcr C and the Young's modulus is 2 ~ I(f MPs. the. stress in thc bar is

u. zero
b. 11 MI'!,
c. 24 Ml'n
d. 1400 MPu

n. 1\ rigid bur is ~'USpc"de'(1by OWc" rocls made I'll' the same rnnterlal as shown in the flgure, 111e aren find lenglh Ill' Ihe ~enlrnl rl~d nrc 3 II and L, fllS(1"ctiwl), \,hili: Ihftl of the Iwo omer rods a'c 2,.. nnd 2l. respectivety.Jf u dnwnwurd ron;nF50 kN I~ applied m lhe rl,gid b;u; the f()tc<s in Ih~ eemrat and ""eh \)\' Ihe OUI~rrods will 11"

a. 111.67 kN each
b. 30 kN and IS kN
a. 30 kN and 10 kN
d. 21A kN unci 14.3 kN

23. rh" m..ximum and minimum she'tlr stresses in a hullow circulnr shnn or outer dlameter 20mm and thickness 2 mm. subjected to a torque 0(92.7 N-n) will be

u. Sf)MFa und 47.1 MP~
b. 100 MPo nnd 80 MPa
c. 118 MPu and 160 MI'I\
d. 200 MPn and 160 Ml'n

2<1. I'he shear s1res~ ~l the neutral II,i~in " beorn of trinuglliur sect 1011whh u buse >f 40 mm wnt height 10 rum, $uhj~'<!l£dttl u shear three of:i kN is

u. 3 NlPa
b. 6 MPa
c. 11) MPn
d. 2(1Ml'a

25. VI Wid U] are the straln energies stored hi a prismoliil bar due to n~iaJ tensile. forces I', and P,. respectively. 1 he slrJin ~ncr!1Y U stored in tbe slime bur due to combined action of I', nod p~will be

a. UaUI~U,
b. U=U,U,
c. U<H,+Ul
tl. IJ>\J,+U,

26. The riaht triangular truss is made 0f m<mbc;:S baving -c<lu;llcross sectlonal area of 1550 mm' WId Youngrs modulus of2)(IO~ MI'tL The horizontal detlecrion „I' ihe- ioini 0 Is

a. 2..J7mnl
b. 1{},25mm
c. 14.31 mm
d. 15.680101

27 The fmU"DCC lioe dingru!11(tLD) SIUIIIT! is ror the member

cy

a. I'S
b. RS
c. I'Q
d. QS

Data for Q.28 & Q.29 are given below. Solve the prohiems lind choose lhe rorr.cl answers,

A two span continuous beam having equal spans „"eh o~ lenglh L IS' subje.cl~d to a uniformly dlmil>ulc-d luod IV per unit length. '1he benrn hns cunSI""1 flexurnl rigidity.

28. Ihe react ion III the middle support is

3. wL
b. 5wL/2

c. $\frac{S_wL}{4}$

, $\frac{\sim SwL}{8}$

29. Ole bonding moment at the middle support is

b. $\frac{\text{\W}}{8}$

a. $\frac{wL=}{12}$

d. $\frac{\text{\wL}^2}{1(;}$

3{1. Cousider the following slJiIJ:nlc,nl$;

1. The compresslve strength of concrete decreases with Increase in wntOr-cement ratio of the concrete mix,
2. Water is added to the' concrete mix for hydtotioo Ill'cement and wOI'knbillly.
3. Creep ~ntl shrinkage Of eonerete .1(c indepclldtlnt of'Lbo water-eemenr J:iiiO ,in the COncrete mix,

'rhe TRUE statements arc

n. I and 2

b. 1.2.od3

e, :2 "lid 3

<I. 00ly2

31. I'he percentage loss Of prestres$ due to ;mebb",!:" slip of 3mm in" concrete 6•• m oflurigtb30m which i. post-tensioned bJ ~ Umdon with an Initial .Ir"",o of 120()Nlmm- and modulus of elasUclt), equnl to 2.1 IO~Nlmml i!t

u, O.~175

b. 0.175

e, 1,75

d. 17.S

:U. A oonCrt:tc bCl1IDnf 1""!Jlngul.,- cmss-section of sjze 120mm (width) and 2(IOm." (depth) Is prestressed by ı slr3ight tendon 10 an "nbelhc force (ır ISO kN at 4In eccentricity of 20nltn (below th.,.,,,."IJ'ujcinl .-:.j^TIlhe depth direction). 'J'he-.lres.cs hl lh~ top ulHl haltom lib~ "rlhe section ~~

-n. 2.SN/mm' (cempressien). ION/mm; (ccmpression)

b, ION/rru,,: (tension). 2.5NflIlril! (coml'r ess ionJ

C" 3.7Slmm' (len>ion). 3.7SNlmm! (compressicnj

d. 2.7SN/njm' (cOmprt:ll ..ion), 3.7SNlmm² !"",mpcessi".I)

33. Conaider tb", foUo\\ iug"latemcDt.s;

1. Modulus of elasticily "f concrete increases \vitJ, increase in compressive strength of concrete.
2. Brillli:ncs~ of concrete increases with dCcrt:A~c in CjJJlIP"",'~ve -.lre"lItil ul' concrete.
3. Shear slJ'01uuh or concrete increase with in.cr~ in compressive strength of concrete.

'file TRUE statements D.rl>

•. :2 and 3

b. 1.2and3

c. 1 aud '2

ll. 1 .mi.3

Dat. fur Q.34 &. Q.35 Me lliv~n below, Solve the problem's and choose correct answers;

.'\ Sin.gJc reinforced rectangular concrete beam has • widlh of ISIImm and a" effective depth of 330.Ull1. The cbnracterisJ.;C couipressive siJ1:ngtb "looDcNt<lis 201V1P• nd tbe c,h.r.clorislic tensile strength of steel i. ~I S~lPa. Adopt Lh" <lr"., ~I()ck for concrete as given in IS:45G-200() and take JiJllilillg va lue of d~ptb of neutral axil! ıs 0,48 times lhe effective dopIli of tile beam,

34. TIlc limilm!! valne of the moment of resistsnee of lhe beam ~n kJlt·m ls

;h U,14

b. O.~S

c, 45.(18

d. 136.82

35. The JinliliJlg area of tension steel UImm² is

a. 473.9

b. 412.3

c. 31.'\.9

d. 312.3

36. t\ steel not of r<letllll'gul:tl' section Of. 17-" 70 Gmm Is connected 10 0 gllSSc:plate by three bolts each having a .shear C"Jl3CII;/ of 15 kN in holes iuivl,,~ diameter 11.5 mm. If the alllm.bll: Lells;le ~ltc.,ill tho fl.l L. lSI) /vIP" lire maximum tension U,.L .all be ai/plied '0 lhe nat i.

T

a. 42.;3 kN

b 52.65 kN

c. 59.5 kN

d. roO,kN

37. A bracket connection is made with four bolts of 10 mm diameter and SUPP0I1S.8 land of 10 kN at an. cceenrrlcltv of 100 uuu, 11.,, maximum force to be resisted by any boll \Vill lie

~ •-.... •••••

ıят

.ı.

'1/

.. •

a. .5 ~N

II. 6:5 kN

c, u.8 kN

it 7.16 kN

38. The plastic collapse load WI' fur (he propped canlilever supporting two poini loads as shown in figure in teams of plastic momem.capaelty, Mr '5 given by

0, 3M" / r

II- 4MI' / t.

c, 5.M" / I.

d.. 6,14, / C

39. Sieve analysis on a dry soil sample of mass 1000 g showed that 980 ,g and 27U g of soil pass tIlrough 4.75 nun and 0,075 •nm sieve, respectively. The liquid limit and plastic limits of the soil fraction

:. of Ju

passing through 425" sieves are 40% and 18%, respectively, n,e soil may be classified as.

a. SC

b. MI

c. ('1

II. SM

40. The water cement of a saturated soil and Ole specific gravity of soil solids were found to be 30% and 2. 70. respectively, Assuming the IUl1 weighr of water to be 10 kN/III'. the samrated unit weight (kN/ml) and Ihe void ratio of the soil are

a, 19.4,0.SI

b. 18.5, U.30

c. 19~4(Jt4~

d. IS.5.0.45

41. The factor of safety of an irilioite soil stope shown in the figure having th~ properties ¢ = O. ~ = 15°. Y",>= I(lkN/m³ and 'I..,.= .20kl'I{llr .is approximately equal lu

a. U.70

b. 0.80

c. **1,00**

d. 1..20

42. Maiolo L{SI-1 with List-It IIud sel.cut the correct answer **using the** codes given below the lists:

Lisl-l

P. Constant 'head permeability test

Q. Consolidation test

R, Pycnometer test

8:. Negative skin friction

List·n

I. Pile foundation

2. Specific gJ'avity

3, Clay soil

4. Sond

Codes:

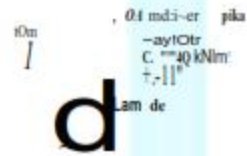
	P	Q	R	S
u.	4	3'	2	I
b.	4	'1	S	

c. 3 ~ 1
~ ~ 1 3

43. TIle bearing capacity .of li rectangular footing of plan dhnenslens 1.5111 x 3m «sting 0.0 the surface of a sand deposit was estimated os *600kN/m'* when the warer table is fa,' below tile base of th~ footing. The bearing capacities in ~N/ml when tile water level rises to depths of3111. l.Sm and 0.501 below the base of the footmg ure

~. 600, 600.40()
b. 600.450. 150
e. 600, 500.250
d. 600. 400. 150

44 What i~he ultimate c.ap;lChy in kN of th~ pile group shown in the figure assuming the gro~p to fall as a single block?



a. 921.6
b. 1177.6
c. 2438.6
d. 1481.6

I)atft rnr Q. 45 8. Q.46 are gh'en below. Sol"c the problems and choose the.correct answers,

Waler is nowh'g through the permeability apparatus as shown In the figure, TIle coefficieu! of perrueability of Ole soil is 'K,' nils and the pomshy of the soli sample is 050.

45. TIle total head, elevation head Bod.pressure head in metres of water ·at the point R shown in the figure arc

a. 0,8.0.4,0.4
b. I,~0,4, 0.S
c. 0.4.0,0.4
d. 1.6,0.4, 1.2

46. What are the discharge velocity and, seepage velocity tlft)\Jgh the soil sample?

a. k.2k
b. $\frac{7}{3}$1t,1"~
0. 21t,k
d. $\frac{4}{3}$-it,~$\frac{7}{3}$k

Data fpr Q. ~7 k< Q.48 are given below. Solve th.e prillllenl~ and ehOC)5the eorreer answers,

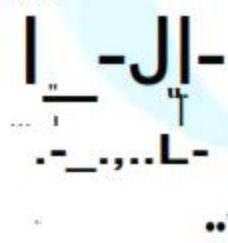
The ground conditions at. site are.as shown in 'he figure. The water table at the site which was initially 813 deptb of Sill below O,e ground level g)i permanently lowered to a depth of 15m below the ground level due to pumping of water over a few years. Assume the following data:

ri) unit weight 01'water = 10 *I<'N/m!*

(ti) unit weight of sand above Water table = I~ kN'Ju'

(iii) nail weight of sand all!! Clay below tho water table; 20.kN/m}

(r~lltl9ttlkienl of volume col'l1Jlre$~ibility.= 0,25 *m'/MN*



47_ What IS the change ill the effective stress in *:k;N/m~* .!ti mid-depth (if dre day layer due to the lowering of the water lahle?

a. 0
b. 2(J
c. 80
d. 100

48. Wllal is 'the compression of the cLly lnyer In rnm dUe 10 the lOlVering- of the: water IiIbl&.

a, I25
b. 100
c. 2.5
tl. I)

49. Two "I."u-o.l:lt.io pro"ipi.Ll1Ors (ESPs) .r. in series, loe fractional efficiencies of the upstream ond downstream IlSPs for size are 80/m sud 65%, respectively, Whal is tho' overall "rlidency of Il,a 'ysl"III.fw' the same

a, l00'ï'
h 9~.~
e, S0":.
d. 65~\,

50. 50&of CO, .nd 25 11of C11., are !unduced frolll th e dt:OOmposition Ilf municipalsolid Wa.,til (MSW) with • £oru,u," "04!JlI of l2ilg Whal i the average-per c.-pit. green hous<>gu" productinn in n city' lll' I million l.e<)"I. Wilh J MSW l'"dul!tion ",to of S0t) lunrdlty1

n. IM!!/dny
b. nOg/day.
c. 20Sg!d.y
d. 313g/day

1>.ln ror Q,51 & Q.Sl "rl" giyen ""low. Solve the problems und dl'Ml:;e correct answers.
A couipletely mixed activated slu~~e proecss j! used to lo.t U wastewater 110" of 1 milliou litcl'~ per doy (1 Ml..J)) b.ving • BOD, of 200'l1jp'!" l'ha bioml1Sli c!JncOlw:tHon ill the aerstion Innk is '200Qmgll and the conocntratioll of the net, biomass. leaving Ih~ .ystem i~SO",!!/l/. Tho aeration tank hna a volume of:lIlOm^{1} •

51 Whal is the hydraulic. retention lime orth e w.,te watel' in ueratioo tank"

a. (,l2b
h. 4.gh
c. 10h
U. 24h

52 Wh.t Is th.e aver.ge tl'me for willelt the biom(l5$st.y. in the ~ys"m1

,... 5h
h. ~ll
c. 2 days
d. ~days

Data for Q. 53 & 5:illte given belol •. Soh'e til" prublerns anti cheose co,.r~'-1 answers,
A plain ~edimentllllil)n 11llikwith " l""gU, .,f 2\)01. width M j 001.• lId • depth or 3," J—uxed it! • 11'.L... "".(menl pllml to b..:at + miUion litt", of water per day (4 MLD). 'I'he ~vet~ge temperature of water is 20"C'. The dynamic viscoshy of water I. 1,002 In 'N.~/Wm1 at 20°t. D.usity or water is 998.2kglru^{3}. Ave ra S" 'PL..u£iQ j\t3vlty of particles is 2.65.

SS. Whal is the ~n,.f:lce ,lVerflo", n,r" in tho sedimentation IJlnk'?

a, 20 mi1tn'/dllY
b. 401lPlm^{z}r.doy
e, 67mJ uz d:ty
d. LJ3m^{J}/1l12'd.y

54. Wb.l iii the minimum dlameter of th" particle wbkh can ,be removed wilh 10G~. effidency in the above sedimentation L."k'i

a, 11.8- I()"'mm
b. i6.0 ltf' mm
c. 50 10^{3} mm
d. 16Q IW'mm

5), The cuhurable command area (or a distributed, channel is 2()'OOO hectares. Wheat is grown in ihe entire Me. and lb. intensity-of irrlgation is 50"11, 'Ihe kor period for wheal i, 30 d3ys and 'the kor water depOl is 120mm.. 111" outlet discharge for the illsltlbutuy should be

a. ~85 IlIjl~
b. 1,2J mJA
c. 4.63 m~/'
d. S,nm'!.

j6. An isQl.led "·hOur ,lo,m OeClIrle9 nver • catchment as follow$:

Time	l" hr	2"' lor	3"· hr	4'1 hr
RainfaU(.lIIn)	9	28	12	7

The 4. ink.'< for tho ""tehm",,1 J" 10111111)h, The cstimlltc4 runoff depth r.lIm the, catchment due to the above ..torm i.

•. 10 DUn
b. 16 IIUII
c. 2(I1IUII
d, 2.., lltnt

Ihlll ror Q.57 & Q.58 .r~gh'l?n below, Solve lhe ,... ohl~m •• "d choose correcl 'lIIsw~n.

Ordinates of ~ I-how unit hydtograph III I hour illlervull:, 81.'111ln&from time I " 0 are O. 2. 6. 4.2. 1 ana 0 m'ts.

57. Catchment are. represerued by this "nil hydrograph is

a, 1.0 Jan'

11. 2.0 F11ll

o. ".2 1.",-

d. 504 I..",'

?!!. Qrllim,te t)f' - S'N'lur lI11il hydrograph fn'; tJ'~eatchmen! ~tr= ~ hourH "

a, 2,0 m'ls

b. 3.0 m^3/s

c. 4.0 m~/s

d. 5.0 m!s

59. I1'0 exua widening required for a two-laue, Notional Uigbw.y .1 n hor.i2onwi curve of 100m radms, ocln~ideJins " wheel ho«, !If 8 m and. !lesigp speed ~f00kmph is

n. O.~2m

b. (\.Cl'2m.

a. I).ttl m

,I. 0.92m

60. While dC$igni,,! :. hill road with. ~ ruling !lr~4icnl.of 6%, if, sharp horizontal curq flf 50m ,~dhl$ is encountered. the compensated gt"3dielll at ~IC ~UN";U per Ib. Indian Roods Congress .speeificatiuns should be

a ·1,4~Q

b. 4.,Sq"

c 5,O~~

d. 5.25(t,...

61. Ihe design speed on a road is 60kmph. Assuming rhe driver reacrion time of 2.5 seconds and coefficiem; (If .meanll of pavement KDrfnc~ :IS 0.35. the required 'IOPP;"!! dist:1Ot-e I'ot rvirtv ..Y tmnic on a single I'I\¢ rond i~

a. 821m

b. 102.4 m

c. 164.2 m

d. IS6A m

62 Ihe width oj' the "~pnnsio.u joint Is 20nun in a cement concrete pavement. The layin; iemperature is 20·C and the maximum slab temperature in .summer is 6II'C. The coefficient of thermal expansion of concrete is 1[1 10" mQ1/m1l1I"Cand the joinLl tiller compresser up to 50% of the thickne8s. The JpIl¢ing between expansion joinlS shOlild be

•. 20111

b. 25m

c, 30m

d. ~OII1

(13. The l'ollrJI"illS iiUI. l't1'jo,ins il) the number of commercial vehiclea 1"' da) for the design of • flexible pavement for a national hilih":1Y as ocr IRC:37·1984;

-ryfW or cotn mercial \'~bicte	NU01b-r Of vehicles p« dllY cnn$hl.rlng the number Mh,nI':'i	\.r~hic:l~ l>IIJ1IIIgt' Factor
Two ,~'(It nueks	2000	
Tandem ~)tle lruc~	lOO	li

Assuming" truffic growth [.!!tOr of 7,5% per annum for both the types of vehicles, Uie cumulative number of standard axle load repetilion~ (m million} for a deyi~ lifo (til"" Y"3"' is

•. .14.6

b. 57.S

c. 62.4

d. 78.7

64. Maloh the foljowing tests on aggregate lind its properties,

Test

P. Crushing lest

Q. I,n~ AlIg.lo~ ahr..,ion !esl

R. S('UJUOCSS n;st

S. Angullliil), lest

Prnperty

1. I1.rdnCi;~

2. WI.:ath";I1~

3. Shupe

4. Strc:ngtll

C.o<L:s:

	P	Q	R	S
a.	2	1	~	3
b.	4	2	3	1
c.	3	i	1	!!
d,	4	I	2	3

65. The plan of a DlDp was ho(Q copied to ~ reduced $il." such that • Ifne ori!!!oaUy l00mm. mdU:lu'.... ')Omm. 'Ib" ong&,oll scale of me plan was I ; 1000. The revised. scale Is

a. I :000

b.I:111l
c. I: 1121
d. I: 12'21

rile following table gives dala of consecutive coordinates in respect of ct""od the odolite traverse PQRSP.

Station	Ntrlhine m	SeuOfi,,: m	ga'lin~ m	Wlitiaa&. m.
R		19').0	1997~	
S,		300.0		'!l0.5

The magnitude nod dlrcolioD Of error of closure in wlrole circle bearing are
A. 2~Om nnd 45°
b. 2,0 u1 "nd "t SO
c. 2.82 m IIm1315"
d. :;"42 m and 4S"

the ,foUowing me3Nurernellts were Illlide durin. testina a 1"".llib2 instrument

Instrumeut ot Sull1 ....ulln g d.

P	2.S00 m	1.700 m
O	2. 700111	L8(10 111

P, ISdCIl!e IQ P and Q ı L~close to Q. If U,.. reduced level or sretion I' i. lOO.(l()Om. the reduced level ohlillion Q i.
a. 9<),(I()(\ m
b. lOO.llt)0 m
c. 10 1.000 m
d. 102,000 m

sa fwo slmillll1 lines i"tell""t 3t nn angle of 609. 'Ihc radius Of. curve),nuııı–Il,. two straight llnos is GQO m. Pbe length of long chord and midO()rdirw~ in ı1ıetrı'1 of the curve-are
... SOA. 600.0
h. (o()().tl, SIL4
e. (,1)(1.0.39.89
d. 49.1;9.300.0

69. The lllllgnttil! 1)c3rin~ of a line AS i~S ~5·Eand the a.clin.ti9n is S· W""L 111. true bearing "flhe nne AS U
a. S 4S"H
h. S 40·1(
c. S 50'1\
,L :; 5()'\V

7(). ,-\ h"l'~o",t>1 water J~t with ı velocity \lJ' lOm/8 and cross 'S.cliol,~l ,r® of 10111111' ~Ir1kes n 0.1 plate held 1100m. 1 1.0 the flow dlre.cLton, 'me density 01' water I. lOOOk.l!,m' The coııj force un the pl,nlo dlle 10 the jel is
•. lOll N
b. l(l N
c. 1l-1
d. 0.1 N

7'l. fi I : 5(1scatc model or ~ sl'iJJw.y is ın t>e tested in tll~ laboratory, The discharge in the prctotype :. 1 ()aOl11~'~.The discharge 10 he m.intain<lll 10l the model testis
o· i).{157m~ls
b. 0.08 ml/6
c. O.S1m³/s
d. 5.7,"³,s

72. A lrilllgullr open d'811001 has n vertex anale of ')()" and clırlc:t llow ot ɒ crilical dePth of 030m. The discharge in the channel is
a. \1.(1$ 01'/8
b. (l, l,l '11'/"
c. 0.15 rrıj:~
d. O.2m'/s

73. Flc)W rolC} of 4 nuid (density - 1011 llg/111³) a 4 small diameter tube is SOO ıoııı³/s. The lenglh .r,d the diameter of the tube nre 2m "lid (.1.51l\m. respectively 1)le pressure drup in 2m longlh in equal to 2.0 MPJ.; the viscosity oflho fl4id is
a. 0.025 N.oim:l.
17. O.012.N.slm'
c. 0,\)0192N"fill'
d. Q.OOl02 N,glm~

74. The flow nite 'n a wide rec!'ngtllar 01"f' cilltllnel is 2.0m"ls per mete widU" The di~llU.1 bOOslop« is O.(X)2. Tlte Manning' 5 roughness coefficient i. 0.012. The slope ofthe channel i~classified as
a. Critic;)1
b. HorrLOntn l
c. Mild
d. Sleep

Datu rur Q.75 all<1 Q.76 urp !liVe" IJeloW. Sulw tho pruhll'llls .lld tlwo." eM.eet ".hwers.

A ,:cet.ngub .. upen chIDllc111CCt(S tu be dc.ignud 10 carrv ,. flaw of 2,Om"ls under uniform flow conditions 1111'M,nnlng'~ reughness coefficient is (l.OJ8. TIt" channel should be soon d,.t the llow depth ;" equal to half the width, and the Ero"de numb", is equal 10 0.5.

75 The bed _lope of Ihe channel 10 be 'provided is

a. 1).()(l12
b. O.<!021
c. 0.0025
d. 0.0(152

76. Keeping the widt.h, Ilow dliPlh .lId rougbn~ss tho same; if the bed slope of the above chnnnel ;$ doubled. the """"S" boundary shear stress nnder l!niJol'tll flow conditions ls

a, 5.6 NI.UI'
b. 10.8Nlm:
.l. 123 f</m~
d. 17.2Nfm'

77. For whnt y~luc~ of a lind 13tho fnUowitl& .imullJlnęOlls eqUlllian~ hb"~oil infinite number of solutions?

$x+y+z$ = S;~·~~Y't3∓l); ~"'21""((7 0

a. 2. 7
h. ~. 8
~. S.3
d. 7.2

71l A velooil) _lOf is give., as P=5.")~-2)·':i+~~",lkT h" divergence oflhlsvatocityv""lor~l(1,l,l)t5

a. 9
b. Il)
u. 14
tl. 15

79. A body criginal 31 G()·C cools down to 4()°C ill]5 mitluiC!! \\1110'kept in air .l " temperature of 25" C \VIlIlI \Vill be lltu temperature of lhe liody 31 the end cyf~O minutes?

u, 35..2'C
b. 31.SoC
e, 2S.1"C
d. iS-c

80: The fuUowing equation neeWl to b~ numericatlv solved usmg the Newton-R;JpIL~orl';ethod.

xJ+-Ix-!l=U

Fhe iterative equation for this purpose is (k .indicate .. the iteratiou 1"",1)

a, ~.ı 2.t!..,. 9 / 3>:,-4

b. x,.! "' ,l!' t-4 / 2-'~ 9

81.

u, ll
b. 11/2
c. 1/4
d. l'i8

82. Potential function. is given asϕ = x'-y'. What will b. tho .tretolD (tood;un ('l') \\'olo 14e cundition 'I' = g .1 u= Y= 01

a. l."
b. :c+ s.'
c. ..2 _ }12
d. 2,,11'

83. TI,e inverse of the 2 2 Ul.trL·~ [l 2 / 7] ds,

a. i[~7 ~~]
b. ~G~]
c. t[~5~2J
d. ~[~ _~]

84. Given thol. one roo: at' the equation x− 111l:~ 3 tx - 30 = o is 5. lhe o.lhCt' two "(Jots an:

u. 2 anti 3
b. 2 and 4
c. 3 and 4
d. ·'2l1lld-3

85, If tlle fil3ndanl devi.til1O of the $pol ore«! 1)!' vehicles ln a 10ghwto.y t, l!.S· ktoiph :md lJie mean "l""" of 111evehicles lt; 33 kmph, 110' coefficient of v.ri.lilll itl "pocd i.

a. O.in7
b. 0.1867
c. 0.2666
d. 0.3646