www.recruitment.guru

The organism. whTch exhibits very nearly ure characterisucs 0f nil idenl pathogenic Indicator 1S

IL t;nlomocha hislC)lyti~8

b. Escherichia cClii

e. SolnlC)ndla ~-phi

d. Vibrio comma

21. ,\ sprinkler Irrigation S~ICm is suitable when

a. the lund gl'I1IIicntis ~IC"f‌and the soil is easily erodible

I>, the :Klil is haying low permeebllity

C, the water table is low

d. the crops to be growlI have deep roots

12. lu 'he comext "Γ flexible pavement design. the ratio of contact pressure to tyJ'\l pressure-is called the Rigidity Fnctor. This factor L~ less' ~IUn unity when the tyro pressure is

0. I= thnn 0,56 I'l/"I1II'

11, equnl ro 0.56 I'Ilmm'

c, "'I11,,I(01),7 N(mm'

d, more than 0.7 N/nulI ¹_

the SIIIT and Grid pattern (lf'rond network" IVRS adopted in

0. Nngpur Rond Plnn

b. Lucknow Road Plan

c. Bombay I"(oud I'lau

d. Delbi Rond Plnn

24. The road geometries ill .Iodl. ure designed lor !be

a. 98'h highest hourly Iramc volume

b. 85'" highest hourly traffic volume

c. 80" highest hDurly traffic volume

.I.)ott> highest hourly troflic volume

25. Real matrices IA1"I. [BjJ..,I.CJJl>5. [OJ"" [El,., and [F]"t are gh'to. Mmrioes [BJ ond [1iJ are symmetric.

following stmCJ11QIllS are Illude with respect to these motrices.

r, Matrix product IP.J' [C]1 [B] [el III is a scalar.

n Mntrix product [OJ' [f) [0J Is always symmetric ..

With reference to above statements, which orthe flllluwillg uppli~s?

a. StaternentJ is true but D is talse

b. Slmcment I is raise but II is true

c, B()lh IlIl::stmements are true

d. Both the sratcments are false

26. The summation ul' series S = 2 + ~ ~~ 2 2- + 2' II +,.....,~15

a 4,50

h. 6,II

c. 675

d IIJ,O

27 The value 0f the function ,tl\) /tnt x' ...X' is -Ji.v -7 .

a. 0

b. I 1

c. 1'

d. I∞

TWO MARKS QUESTIONS

28 In u 1"0 dlnJenSloJlul stress analysis. the stule III stress at u point is shown betow, If ,,- 12(1 Ml'a und ι ~ 711M"I~ o, and <I" am respecrively.

g. 16,1Ml'u1Jnd 172,5MI';1

b. 54 MPu lind 128MPQV

C. 67j MPa and 213.3 MPa

d 16MI'!1 and 138 Ml'b

29. Por !lw linear elastic beom shown I" the figure. lbe flexural rigidity. El 15 78 r1jO kN-m'. When w =H1 k.N/Ill, Ole! vertical reaction RA at A is 50 kN. Tbe value oCR. ror w - IOOkN/mls

a. 500 kN

b. 425 kN

c. 250 kN

d. 75kN

30 A homogenous. SiM1p[~ 3i1p1Orr-d prismauc beam of widlh B. depth D and ,'pnn l- Is SUbJctIcd to u ~'OnoentrBle(f Innd of magnuude I' The load call be placed anywhere n10ilg the span of the beam. I'he tJllLxil1\u!1l 11eSltra' stress developed ill beam 1)1

a. 1 Pl..) BD'

b. J /'l, "4Bl.)'

c. ~ Pl. 3no;

d. 3 Pl. IBO'

3l. II circular solid 5hall of spun L -;) 'lll is fixed at one end and free nl uie tuber end. 1\ twisting moment T -. '()() ..N·m i— -apl1ll-d al d.e free end, TIle rorslonal rigidity (l.l ar 5()()11(kN-nlllrad, following statements arc made lor this 500ft:

, The maximum rotation is 0.01 rad.

2. The lQrsionnJ strain IUlergy is , kN-rn.

With reference to the above suuements. whiC!hof the f"llpwing nllpli~'1

a. Bt)lh.Slat~llilllS' are true

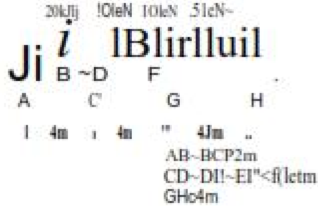
b SUllcmcnl I lS true but 2 ;$ false:

c. Sllllilmeill 2 i> true hUl l is False

d .Both the SlOtcmcm~ute lills.:

I)olll for Q.J2 & Q.JJ un' glY~11btloll. Solve lhe problems and choose the curreeranswers,

A tlorce-Sl.3Jl contlnuous beam has an interual hmge at B, Secuon B is at the mid-span of AC. Section E is m the nud- span of CO. The 20 liN loud is applied :n section B whereas 10 kN loads ore npplieu at sections' D and P as shown in the figllre. Span GH is ~ll~io!C.l~d 10 unilermly (liSlriblll~d Illad of mngnitudcs kN/m. For Ih~ loadiJl~ shown. shear iorce immediarc 10 the right "l' seeuou E is 9,84c kN upwards und Ihe hogging mQmcglltt~c[io" ~ is -,0.31 ktil.m.



32. Ilie magJlHudc of' tl1c sT1~'3r rorce Innnediurc 10th~ l~fl und imllletliule 10 lhe right (If,eClilll B are, respectively

a. 2 and 20 kN

b. lOki-! and lOkN

c. 20 kN lind 0

d. 9,&4 kN und 10.16 kN

33. 1'lie vertical reaction ul support H 15

a. 15 kN upwllrd

b. 9.84 kN upward

o. lS kN downward

d. 9.114 kN downward

34. An RC shoo column whh]00 mm x 300 nun square cross-section is made or M20 grade concrete und has 4 numbers, lOon In diameter longitudinal bars ofFo415 steel, It is under (he action of a conlli:ntric axial compressive loud. Ignoring Ute reductio» hl the area Of concrete dne to sleel bars, th~ 111Llmil(-;).\'inlhlila Cllrryin(!.cllp"cily of ihe column is

a, 16~9 k]\'

h. 1548 kN

c. 111')~kN

li. loMkN

35, A ~imJlI~ supp<ll'l~d pri!5itr"!<scd concrete beam 1& 6m long nnd 300mm wide. us gross depih is 600mllL IL is prestressed b) horizomal cable tendons ai a uniform c('CCntriuily l)." lJ<[lll'l, I'he prestressing tellsile tbtw iii the cable l~lldon5 is r OOOkN. Negle~l Ule self weighl or beam, The maxlmuru nonnni lJompressiYe SIre.'I$ iii the beam ut transfer i .

u, lcro

b. 555 N/mm'

c. 11.11 N/mm'

d. 15.68 N'/mm'

36. An RC'square fbonng at' side Ilmj,lth 2m and uniferm elfectTve depth. 100ntm is provided fOr ii 300m," x 3()Omm column The line (if acuon (li' lhe verlieal comnressive Il)uli 1)\!>'cS lhn)u~h lhe celtlroid IIf Ih~ tOllting. as 'I'ell IL~ (ll' lhe column, lithe magnitude uf rhe loud is 3201u'l. lhe nommul unnsverse (one waYl shear stress in the fOOling[s

a. (1.20 N/mm

b. UJON/mn,l

c. 0,34N/mm'

d. O.75NlllIm'

Dllla fur Q.37 & Q.38 UR gi\'en b~tow. Solve the problems and choose correct answers.

At the limit stat", of collapse, an RC beam is subjected to flexural moment 200kN-m. shear force 20kN and t()rque 9kN-m. The beam is 300mm wide and has a gross depth of 4250101_ with an effecti ve cover of 25mnL The equi valem nominal shear stress (T,.) as calculated by using the design code turns our 10 be lesser than the design shear strengih (,.) of the concrete.

37 The equlvalent shear force (V,) is

- a. 20 kN
- b 54 kN
- c, 50 kN
- d. 68 kN

3'8. The equivalent flexural moment (M,~) for designing the longirudinat tension steel is

- a. 187.kN-J]1
- b. 200kN-lll
- C 2M kJ'l-J1l
- d. 213 kN-I"

39 A square stool slab base of area 1m2 is provided ror!l column mad. of IWOrolled channel sections The ,00111m . 300111111 column carnes an axial compressive load of2000kN The line. ofactlou or the load passes through the cenrroid of'the column section as well as of me slab base. The permissible bending stress In the slab base is 18SiVtPa, The required "1111,,~um thickness of the slab base. is

- a. I10mm
- b. 89J1lOl
- c 63111111
- d 55111m

40 A strut in a steel nuss is composed of two equal angles JSA 150 mm > i50 mm of thickness 10 mm connected back-to-hack to the same side of a gusset plate. The cross sectienal area of each angle is 29211Jlm' and moment "I' inertia ,(In– l,~) is 6335000 mm' The 'distance Qf lhe cemroid of'the angle from lrs.surface (C,- !:,) is 40.8 m111. The minimum radlus of gyration 01' the, srrur is

- a. 9J .2nutl
- b 62,70\1\1
- C, 46.6111m
- d 29.8111111

41 Two equal nn'gles rSA 100ml11 • 10001Di of thickness I,111111' are placed back-to-back pn.d connected 10 the either side of a gusset, plate through ~ single row of 16mln dilln.lter rivets In double shear. The effective areas of the connected and unconnected IC2S of each of these angles are 775mm' anll 950lllm' respectively. If these angles are NOT lacl<riveted, the net effective area orlbis pair of angles is

- a, }6S0mm·
- b. 345.0ottm¹
- c. 3()76intn¹
- d, 1899111111·

-l2. A moment M of magnitude 50 kN-m is transmitted to a column flange through a bracket by using four '20m{l1 diameter rivets as-shown in the figure;

43

The shear [01'01 induced ill die rivet A is

- a. 250'1.l'l
- b 17S.8kN
- c 12$ kN
- d. 88.4 kN

44. A propped cantilever of span L ls carrying a vertical concentrated load acting at midspan, The plastic moment of the section js M. The magnitude of ti,e collapse loa~ is

- a'. SM. / l.
- b. 6M. / L
- c. aM,. / l
- d. 2M. / t.

4~ The figure given below represents the contacrpressure distribution underneath a

- a. rigid fooilng 00 sarorated clay
- b. rigid r06ling on sand
- c. ile.)(iblefootillgOri saturated clay

d. flexible footing on sand

46. A em thick c18)1 layer undergoes 90% cousolidation four lini6s faster under two-way drainage as compared to one- way drainage. In an identical clay layer of 15 ш "va-way drainage .will be faster as compured 11 lone way drainage by

a. 8 thnes
b. 4 times
e 2.5 times
d. 2 times.

47th" fig)lre below shows t.wo 1101"lln-s for seepage across an loterface between two sail media of different coefficients or permeability. Lf entrance angle U. ~ 30". llio exit angle a.j will be

k,-1.O'llT'mt.

n. 7.50'
b. 14.03"
c. 66.59-
ll. 75.96"

48. All unsupported excavadon is made 10 the uraxanum possible depth m a clay soll hnving 11 = lRkNlnl. c = lOOkJlUm², 4. = 30-. Tl,e actl ve earth pressure, according 10 Rankiues theory. ar die base level of the excavation i~

a. I! SA7 kWtn!
b. 54.3(\ kN/I1l"
c. 27,1 8k.l-l/IU!
d. 130 kN/m'

4,). A rC!aiuinl!,wail of hdgh! 8m retnins D,y -.mid In lhe mitial stare, the soil is. loose lind has a void mUI) 01:05. 'l. ~ 17.8kNlm' and ~ = 30°. Subsequently. the backfillrs. compacted 10 a state where V0l-[r~.ti().. 0.4. l. = 18.81<1'lim² and ø =35°, The rario of initial passive rhrusrro the final passive thrust, according l¦l Rankine's earth pressure theory, is

a. 0.38
b. 0.64
c. 0.77
d 1.:55

50. Anlnl1nilesoll slepc wiih an in611mition 011 J~o lS :mbjc.\cled ш seepage VU1':ll!cl 10. ils surface. 11•• soil has c' = 100 kNilil and 4l' = 30" U it" thtl !:OnC:lnof mobilized adhesion and frfctlon. at 11 factor-of safety of 1.5 With respect to shear strength, the mobilized tr1clion angle is

a. 20.02~
b. 21 05"
C. 23.33"
d. 30.00"

51. LJsing ~ll -0 eualysis and !lSsumillg planar failure ns shown, the minimum factor of safety against shear lililul'e of.a verncal cur of height 4m in a pure clay having cu -
J 2(JkN/m' an.d Y.. =2()k.N/m' ls

T
4m
v..lial
.1

a.
b. 0
c. 10
d. 20

52., In the context of collecting undisturbed son samples, of higft quality using a spoon sampler, following statements-are made;
I'. Area ratio should lie less lltan 10%,
II Clearance ratio should be less than 1%.
With reference to above statements, WhlCh ofthc jo!Lowillg applies?

s. 80lh the staretneurs are rrue
h. S~t"D1"njs His, true but l. is false
c. Sratemem.t is uue but I lis false
d. Both the smternents'a~ mise

Data for Q.53 & Q.54 are given below. Solve the problems and choose lb. correei answers,
A group of 16 piles of LOm length and 0.5111 diameter is installed in a I(1m thick sol'!' clay layer underlain by rock. The pile-soil adhesion factor is 0.'1; average shear strength of soil On the sides i~ lOOkl':l'; undrained shenr strength "flh"""il atthe base lS also J no klla,

s:t The base resistance of a single pile is

a, 40.00 leN
b. 811.3$~
c. 10(1.00 kN
d 116_71111'1

54. Assuming 100')-0efficiency. the group side restslwlcei's

a, S02.6.5 kN
b. lMO(l.O kN
c. lQO$3. l kN
d. 201(l$.0 kN

55. " velocity lieli!;$ given :i−f = 2yi +J.,J whore 'ıt ond T ore in meters. I'he acceleration of a 'nuid particle .t (x, Yl – lJ. 1, uı the" dlrectlon i~
a. 0 mill'
b. 5.00 mJ"l
e. 6.00 n'i~~
d. SAS mJs[1]

54, The "eloeity in mI$ al R poinl in • two -<Iim_;oMI flow is given ')$il' – li + -:j . The equation of the stream line pa.~-in!l through the pollli i.
n, 3d." - 2dv - 0
b, '-" ... 3y ; ll
c. ~d.,<+1dy = ll
<L ;"1'=6

57, 1\ fin: pr()t"clilln stem 1$supplied fro", " water tower wilh u bent pipe us shown f. the figure, 'f'b" pipe friotion f i~0.03. Ignoring ell minor losses, the maxrmum discharge, Q, in lh.e pipe i.

~-'I.ld-jOO-
-Q
~

a. 3L7lilfse"
b, i4.0Iil'890
c. 15.9 lil[.otoo
d. 12.0 JiJJ"'c

58", :\. slendy !low occurs m ııı open glum"el with lalernl-inflolV 01'q ons per unit widlh M shown ln the figure. Tho mass conservatlcn equaliM 15'

, _rrc..
QDVt'_ + -:I .

R. iJg/aT .)
b, aO/d. ;O
e, OO-q-O / at
(L ag. '1=0 / d.

59, A steep wide reotangular channel takes off" from • reservoir """ing on elevntion of' Illl ;2m. At the entrance, lhe< bottom elevation 0l' the channel i. IO()m. If the slope of the channel is increased by 4'1>0., ofJO the dlscharSe per unilltngth in the cbOllDb) will be
ıı. 2.24m~1!l
b. hrSher tlinn2.24111!'. by -I';"
c. lolghet than 2.24",'1, by 2%
il. "hok"d

1il1. TIle heighl 0r " l•ytjrauli" jump I" tho" ~li"ing l)Qo1 0f 1:25 sll;Jl~model ":IS observed r.o~ lOem, TIle cOtl'OSponding prototype hoight or thc jump is
c. not determinable l":'.ll the dat" given
b. 2Sm
e. O,~m
d. O,lm

51. A thin Ublplat"O.5m 0.700 inJ<iz".<!Ules III u lu~g~ tauk of weter with ≈ tJmnin.J velocity of O.I2mis, 'The coefficicnts elf drug C --Jr328. lorD l'ammar bOl-DuUry / VR,
layer lind C"- (l,i)12. / (R,)" Ibr a lutbul.ent boundary layer. where ll_ is the plnte Reynold; "wnber:. "'sume fl-10"'N-slm' ond p-Ill0kgl m"

~"iD';"
0Jm

The submerged weight ofthe plate is
a. l).\1ll ~ N
b. l),OllMN
c, 11.0231 nr
cl 1),0376 N

62. "Inc nllownblc Net Positive Suction Head (NPSH) for n pump provided bt the manufacmr es for n now or tl.05",'" i. 3.3m, The temperature o water ls 3tl"C (vupour pfe'I.ure head ~bsolulc "" (lMm). atmospl."rit! pressure is ltMl llP. u~plute nnd ·Iho ·houd lOll, from the re~ch'Qir tll pump i. O.;\N·m/N, 'lhe maximum height of the pump above the 8u.tioo reservoir is
ıı. 10.1911'
b. G,S!) m
c. l'd 5 m
d. 2.86m

J)1lt" for Q.63 lUld Q.6-j oı· given below, Solve rho problem. and cheese <01T«'f llnswtrs,

TIie 13111"" nO\\ Itoo,S place between closely spaced pamllel p1nt<'s as sl.JO\VU in flgur< below The \'elooit111fllfile i. given b)" = I'~ '1,,, gnp hoight, h. is 50101 and the space is filled with oil (specuio grnvi1y - /).1!6. viscositv 1'=2xm-·N-.I",'), TII~ bouom phil. i~ Smlional)' and the top plnl. moves with II Slenely vdoci~' of V = S cm~s, The UNn C1f—nplul~ of 0.25111·

63. The MLc or rotatiou or 11 nll.d pMlicle i~ given hy

u, /)) "O:t/) "L / 2h

b ffl :0'(1) : :.. y / Jj

c. =J';IIJ, '''.! / h

d. ,, "1 / h" ll) = 0

64. The power required til keep the plate in ~,e:ld)f1,,Jlion i~

a. S I1)'' w~l,L~

II 1O·-wnus

c. 2.5 1O.-wnus

d. ~ 1O--watts

65. The present pnpul8lion of o communitv IS]]lO0fl whlr on evernge water c(lnsul1Ipiiall ,f 4200 01'/d. '0,,,- existing wmer treall1t~nl plant hns n design '"pnc.iiy 01' 6()O()m/d. It is expected Ih.1 tho population will Inerense 10 -14000 durlnS the nu.x; 20 yeers, 111~number oi vears Irom now W.b.lll the pkun \ViII nJj)~'h its design cnpaciry, ussuruiuS an aritlnnetic rate of pepulaticngrewth, will be

u, 5.S ye."T~

b. 8.6 'y~:U'll

c. 1S.0 vears

II. 1(,oS ~eal'"

66. WIll~r SIUlillc~ (X "lid Y) l;0111 (wu ,lill;""nt '0111'0"S were ".(/ughl 10 Ihe laholIllJJI'Y fo~ 11,< 111i.'ru;uro01ctJl l)f dissolved O-'YlL-l iDO) ILsing IIlodified Winkler method.. Sarnplas wen> Ir;lOsferreli 1.0 300m/ BOD bOlll~!; 2ml of MnSO" ~OlUlioll 'Uld 2ml oj' tllkulli)did~,"zid~ reagent were lidded 'to 'the borne. and mixed. SAmple X developed • brown preclpitate whereas sample Y developed II while precipltnte. In reference 10 these (>"s~""n1ioll'. Ihe oorreet sntement Is

~. bulh the smuples \\·.r.,.d~voitl 01'00

b, Jlllmpl" X was davIlid I)f DO while sample Y ollll.iINd DO

c. liUlnple X conmlned DO ,vhile ."mple V 11'11.llevoid oj' DO

II, 001:11'Ih'samples oontained DO

67. A stani:lnn;! OIulllpl",tll))" timllonjalion tëSt was conducted on a ~11Dtp.leofwater from a sudn~ stream, The results of the analysis tor the confirmed lc.!ll,0"; gil'" 1»10".

Sample size (ml)	Number of poshlve resulls out QfS LUbes	Number Of negative. results 011 lof5 lubes
I~	4	t
QI	J	2
0.01	I	4

MPjlf index nnd 95·0 CQnfideli~e liltilS for combinnH"n nT Pt)~ilive resul ." when five lube:: us~d Iler dilUlfons (100l'. 1.ll mLO.l m/)

Combilll!li<llt uf' p>filivQI	WN Index, per 100ml	9S~'C!olIfid"IC~ limil lower:	Upper
4-2·1	26	'12	SS
-1-3-1	J3	IS	77

U~lns the nbove MPN ;ndell 1.'11>1..the M<l!<l Probable NUlllber (Ml'l<ll of the sample is

:l. 26

li, 33

'" 260

d. :l:J()

6R. The design pa.(llllel<l' 1.)0' n""""lltlillil i~ -g,i)"iYtl by o tJlll-'ıtSinllens number G1 where U is U,c I'el()City gradieut ami I is ihe detention tlru.l. Vallies Of Gt rauging froni 10' m l()f oro commoniv 1150d. wlih mngin& [rom l0 to J() THitt 'lite most preterred combinetien Of G nod I III pri>d.,~ sm!llIer lind denser 00'* is

a. large G l'31(1'" with short I

b. IIlIge Gvalues with 1011g'

c, ~ll1111 G vulu".' with snen t

J. .smnll () .UhK'S wilh short I

69. Chlnnll" wis uscel for di,fnt'ecli(lII c.,lt~lines wilh \\,Ill~r 10 fllnn ll,vpouh lor"u. .cld (IIOCI). 11)0 IIOCI iQniz<'S li) ff'jl11 hypoohl,jrilc (OCfl in a rev"",ible rouoli,oo:

IJoe ~ II' OCr tk - 1... 10-jjIII 20'C), the etjlllih,;um of "hieb j~ governed by rH Tlle –u~0f HOCT U!lt! OCr Is kno.\l'Jl <i– fr"" cj11orjne 1'<lSidllUI lind HOl-'I i~ Ille more ctl'e..1Jvc disinfectanl. The ~).,. motion (Ir HUCl in the lree chlorine 'Clidll.1 i~.alljlila&le al ~ pH value

a. 4,8

b. 6,6

c, 7,5

d- 9,4

70. An analvsis for dctermlnation of solids In the ~m .Iudge af Ao,iv,rled Sludge. ['ruccss was done as follows:

1. A OJ:Ucible w11.1 dded L, • C(I'~SIJQI m1l" of 62A85g,
2. 75 ml of • well-mixed •• mple ~••• taken in the crucible.
3. the ct'U"ibll\\i~, UII"ample ms dried 10 u constant mass of G5,(l20S III = d~g oven at 104°(,.

~, The crucible w11.1 the dried ~3mple was I""""d in • JJluID. furnace al 60()"C_ [0" au hour. Afier "<luling, the ,Jl.";l of Ole cnl"ihltnvifh teSldues wasl)3.J '15g. Ihe e,)nIlCnlration "I' organic rllt!,if)R nl' ~<ilid, l'[<"""" in the retum Sludge smnple

a. S~OOmg/1

b. 2SllOOmg]

c. .B~OOm&1I

d. 42600mgJ/

71. f\ portion of waste water sample WOI SUbjected to ~I""tlanl nOI) te&t tS cloys. 20·C). yield,ng a I'AIOe of 18OmS!I. The reu"liull rate coukl.,., (," the hDsc 'c') III 20·C w.s taken .~ 0.18 per y. The r<1uctic)Orare C')ll~t."1 .l Illter t<lJI'Il)cT:t",re nlbY be <:!llim.lei! by ~T = k'4 (1.047) "~"I The temperature .L which tile ether pOrtion l'lf1hu samphHhuuld be tested, to exert llta:. same BOI) in 2.5 davs. is

"' -L9"C

b 24.9·C

e. 3l.7·C

d. 35.l)·C'

Ihe following data are grven for 4 channel-type grit chamber ofk-ngtb 7.501.

1. nOIV.lhrough velocity =03m/s
2- Ihe depth of wasle w3ler al flow it] Ihe ch.lIncl ~ 0.9 III
3. sptcille gravity ofworgruU" portio!". 2.5

g - 9.80 nl/Hl. I' ~ 1.002 • Hr" N _/llI' .1 20"(', Pw = IOOOkg1m' i\s~lImi"u Ihal II.,, ~I"ke's loll' is valid, !~" iJlrgesl dl31U"lcl' pnrticle thai would be> I'CltlQvecl wi~1 100 Il|hOl!ul uffici"lloy is

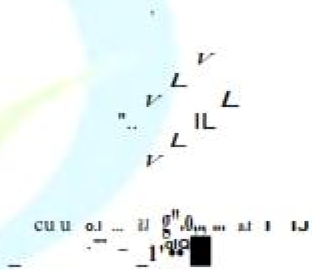
u, 0.04mm

b. II.21mm

c. 1.92111111

d. 6.6411l'lll

73. An e."istut~ 300nun diaureter circultu-sewer i. l;id a' a shipe of I : 2~ and ""rties a peak di.charj!~ 01' 1728m'/d. Use the p.ltiaJ flOW d~'1HU shown in Ihe given figure nnd a.'SUllie Mtllloing'$ n : 0.01S.



AI U,e peak discharge. Ihe depih Of flow :llld the velocity art ..respectively.

n, 4S ITUII and 0.28 rnts

b. nO mm and 0.50 mf~

c, lSO man and 0.57 nIT!;

II. ;100 mlD and 0.71 "ilK

74, The average minf.Jl for. 3 hOUl'dul'llliOo storm is 2.7cm .nd the lo>co rnte ;. 0,3cm l hr. The t10cxl ,hydrol!f'll'h lin. base flow of 20111',. and produces a 11"ak DbII' of 2ioll1 1 /s. 'TlI. peak ot a 3·iJ unit hydrosraph is

a. 1'25.50 m^J ~

b. I0S. S0 U)"

c. 77.77 1l1l's

d. 70.:;7 mJls

75, 'The ralnran dunllll three successive 2 hour periods ar e (1.5. ~,8 and 1.0Cm. The surtace ruooJr resulting from th.lJ swrD1 is 3.2onl-TIl". inde." ,••luc "flhi~ sronn i~

a, 0.2() cm/hr

b. Q.2S emthr

c, \1.30 c'Ul!ltr

d. U.SO omlhr

7(;, A C\'l"al irrig.t0S • plJrtion Qf' cu'llurnble commllnd .ren to grOI. SIl8~n::.nc nnd

wheal. The. evenge discharges required to grow sugarcane ond Wheat are, I'l:$pecHvet)'. 0.36 and (l.l7 eumees. The Iime f.ctor i. 0.9.
t,.e required desiS" C'11'.dty of the eannl. i.

a. 0.36 eumees
b. 0.40 cumces
c. (\6il cumecs
d. O.7(1eumecs

77. lhe d.la glven b~",w pertain to Ihe design of • llc;Ul.>l~ paverneut:

htitinl troffi~ = 12J3 cvpd
!'rame growth rate = 11%per annum
Desrgn life= 12 yea",
Vdli~led"1U3gc factor = 2.5
Distribution rictor - 1.0

The design traffic In terms Ll' million standard axles (m~.) 10 be c.Itercd would IIIII

a. 0.06 Jlll!"
II. S,4n n.s~
e. '2 b()O (TIS.
IL 322601.4

78. For a road with camber of 3²u 'Uld the design. speed of lI0 km11r. the minimum. radius of ~1I'curve heyond which 1)10 super elevation is needed is

it. 1680m
... 948 m
e. ·406 m
d. 280 m

79. rb~ co...,ffieit:U1 of friction III 0,. longillHliUJII direction of " highway j. estimated ... (l.'19l;, T11ohraf(mg distance for 3 carmol'lng .1 "$pe;:d of6Skmflu';::'

a. 87m
b. .ISm
c. 42m
d. 40m

8CI. I1lrelH,ew roads P. Q and .R are planned ill n <lislJ'ioL Tile d.1n for U,cse ,'Qad!! are ~i\'en in .!he table below.

ROAd	Length (1<:~)	Nllmher uf villages wlth 108,II,.n 2000	20(){l- 50()(J	mU1'e1h.n SOOQ
p		8	(I	1
(I	'28	1|2		II
R	12	7		2

Based 011 the principle of maximum utility. the' order of priorily tor lh<.." throe roads shmdd be

a. P.Q.R
b. Q. R.l>
c. R, P. 0
d. RoQ.P

81. A MnrohnJI spcc111 1011 is P""l'ar"a *for* bituminons concrete with n hilumen content of 5 pel' cent b:- weigJ'1 of lulal mix, 'The tlloorctical and the measured unit. weight. of lb. mi'<. are 2.44281c1113 nod 234581.:.m). respectively, The bitumen has a l,,,,,,flic 8.Jl\'i1~' (it 1.02, The per cent void. in mineral aWeg.1.e: liD",I with bitumen (VFB).nre :

a. 34~5S
b. 35.9
c. 13.55
d. 143

62 Thl: eigenvalces II fII ie muu'~'4 1 -2

a. ıre 1 ;ɹ.u 4
b. itr" -I ~1ld 2
c. are 0 and S
d. cannot b. determined

83. The funclion lr.-l~ 2.,, - 3)(; - 36x + 2 has its maxim a.a t

a. ,,~-2 only
b. >:: t) only
c. I(~3 only
II. buth x = -2 nnd ~ " 3

R4. Biotrensformetion III' an organic C(lmpOIJ1]having "oncenrrillil)n (s) Clon he modeled Ilsjn~ an ordinary dlff~renli.1 equation '/~ d, U, WJl~u " ln llb> ,O- ctlon mt<: conslent, If x ~ a -.t t = O. the sohuior» Of the equsuon i.

a. .r=Qe"""
b. -:--+ ¦ (/ s n
c. ..=a(l-~·I»
d. _-=l' ı .lII

85. A bydra:ulic structure has four gu.t.. wluch 01"".," independently. The probabihry {If roilurc ot t:'Jch g.tc is n.2. G.iveo Ula-folle J Il'Ulfniled. U'<probnbiljty U..t. boll, 8111~ 20M3 will thIIi~

a. 0.240
b. 0.21)(1
n. 0,\140
d. O.()ON

---..::C:.:,IV..:.,;I:.:t.:...,:E=.::N:.:.,G=.:.:.IN,::E;::E:.:,R.:,:I.:.,:N;.;;;;G---J

ONE MARKS QUESTIONS

For linear elastic S\'SlCtnS, the type of displacement funClion for the stm)n ene/gy is

a linear
b. quadrtliit
c. cubic
d. quaruc

In the Jim,l slate design method 0f concrete structures. the recommended partial material safely factor (y",) for steel according to IS:45()::200():is

a. 1.5
b. 1,15
c, 1 On
d. 0.87

3 For avoiding the llinie slate Qf collapse, lhe Sllfel), of RC structures is checked for approprlate combinauons 0f Dead Load (DL). Imposed Load or Live Load (IL), Wind Load, lWL) and Earthquake Load -(EL). Which of 1he following load combinations is NO-r considered'!

tt O.9DL+1.SWL
b. 1.5DL+1.5 WL
c, 1,5D['+1.5WL'H.sa
d. I.~DLtI 2IL+I.1WL

4. In a plate girder, the web plate is connected ııı the Ilange pi ales bv ft ller w~lding. The size of the fillet ,;'eld_s is designed 10 safely resist

a. 'rho bending Stresses in the flanges
b. the vertical shear force atthe secuon
c. the honzontal shear force between the flanges and the web plate
d. the/forces causing buckling in (he web

5. Rivet value ISdefined as

a. lesser of the' bearing. strength of river lind the shearing strength 0f The rivet
h. Jesser of the bearing. strengih of rivet and the tearing srrengrh of'thumer plnte
c. grea.lt)r of ııı) bearing strength of rivel and the shearing of ihe rive!
d. lesser 0f the shearing strength of the rivet and the tearing.strength of thinner plate

f\ 111mthick day layer ,s underlain by a sand laver of 20m depth (see figure below). 'The water table. IS 5m below the surface 0f ctav laver. The soil above. (he. water table i's caprllary .saiurmed. The value My", is 19kN/nllhe unit weight of wl\lef'is y.~lf now the water table rises to the surface. the effective stress al н point p.P" tho Interface will

2()ul P

— — — — —

a. increase by 5yw
b. remrun unchanged
c. decrease bv Sr.
d. decrease by I(ly..

7 A unit, volume of n mass of saturated soil is subjected 10 hori7.onlnl seepage. The saturated unit weight Is 22KN/m³ ruld the-hydraulic gradiem is 0.3 The resultant bod)' force on the soil mass is

a. 1.98 kN
b. (i.r. kN
c. 1 JA9 ki'<
d. :22.97 kN

In an undramed triaxral test on a SarUF31ed, clay, the POLSSOn'S ratlo ıs

a. o'. (cr,-a,)
b. o'. (ai-a,)
c. (a,-asl a,
d. la,~O'j) o'.

I). The un-drained cohesion of a remoulded clay soil is Itll.N/m² If the SeliSili"ily. of the clnv ııı 10, the corresponding remouJd~c<lmpressl"e'strength is

a .5 kl)j/m²
b. 10 kNlm"
c. 20 kNim'
d. 10n kN/m~

www.recruitment.guru

10 '('IV" circular lootings (if diameters D and [h are r.slinl! ",\ lho) surface of Ill" ""me p-roly cohesive soil The ratio oj' their W'o~ulti 111111-<ril- cilplltlill"$ is

<. J)II r):

b. 1.1)

c. D; ~ i

d. D~, Dl

11 The roli,. of saturated IUlit weight to dry 1l~1l\Vuig_hlf u soil is 1.25. Ir-Ih~ specific gmvity of solids (G.) is 2.li5, the void ratio of the soil

a. 0,625

b. 0.(,()3

c. 0.\144

d. 1.325

12. The II component of velocity ill 0 two dil)1~n~ion.1 incompressible nnw is given bv u = 1.5l(. Allhlt pQint (x, y) = (1.0), thd y' component of veloeity r = O. The eqwlilln tor th~youmponunl "f vd()cily i~

u. ,,-0

b. v = 1.5y

c. I-~-1.5x

d. v= -LS\f

13. A j'rieti(»)i~'s~ lluid Of del]~'ly po,)\\, Jhrnugl\ • bent PI~ us shown below, If A i, the cross sectional urea and V is the veloclly of flow, the forces exerted nil *iI'1le'll l Z Of the pipe ill the II and y' directions arc. respectively,

'L .

a. prlV1;O

b. 1',)1-;.J2p -lf'.J

c. O-0

d. 0;-1/√2 /1,.11"

14. In lit" iotlindd I1lUl1")1I~I~fshu"," jn Ih. tigure below. fbe reservoir is large. Its "llrface may lJll illOlllJl1cdIII remain at 0 fixed elevniion. A is connected 10 o gns pirclii,o und the d-nCVli"J) noted on !ho i,,,;.lined glu.s rube is 100 111n!Assumlng 0= 3D' nud the mnnometrlc tluid ns ,,;1 with sl"oiiic gr~vJI~" Of 0.86. U\e pressure utA is

II

a. 43 nun IVtter(vacullm)

b. ~3nun water

c. 86 min water

d. 100'111mwnter

15. For a pipe nr radius, r, UnWlllg !IUlC till under I-he (lction ot' gravity, the hydrn.uli~ depth is

a. r

b. Hr'/4

c. r'/2

d. 0.3!17r

A wide channel ls 1m deep and hus u velncity of flow, V. is 2.13 mis, If n disturbance is caused, on elementary wave can l"l vel upstream wilh .. veloeity \,l'

a. lOOulls

b. 2.U lUis

c. >.13 mrs

d. 5.2601/8

17 All niroraft is Ilying ln level Ilight et II speed or 200kmihr through oir (density, I' - 1.2 k!!lm~.and ,'iscosi~yJ.l - 1.6 H'- sll!l~). Tl,. litl C<,);llikielll ill this ~p~ is 0.4. and We drag ,,(lCll'i~iotll u 0.0065. TII<l LOtlSS of th e aireraft is 800ks. Tho dl'"tive liit oren (lf the ..reTllfr i.

a. 2l04Ju'

b. lO.6m²

c. 22"1.1

d. 1 Ion

18. MUlil "I' the, lurbidil> meters We,d; on the scanering princil'l.:. The ""bodily value so obtained in expressed ill

a. CPU

b. FTU

c. JTU

d. NTU

19 Hardil,es.' of water is cll",ctiy measured by titr~lj~n with ethylcn,ai-3111 me-letraceric acid (lmTA) using

a. eriochnnne black l indicator

b. Ierroin i.ndicnlOr

c. methyl orange ladil:att)r

d. phenolphthalein indicator