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Α

M.Phil./Ph.D./URS-EE-2019

SET-Y

10037

SUBJECT: Civil Engineering

		Sr. No	••
Time : 11/4 Hours	Max. Marks : 100	Total Questions: 10	0
Roll No. (in figures)	(in words)		_
Name	Father's Name		_
Mother's Name	Date of Examination		_
(Signature of the Candidate)	· <u></u>	(Signature of the Invigilator)	_

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			and the second s
	1.	The transition curve used in the ho recommendations is:	rizontal alignment of highways as per IRC
		(1) Spiral	(2) lemniscate
		(3) Cubical parabola	(4) any of the above
	•	Bitumen of grade 80/100 means:	
	۷.	(1) its penetration value is 8mm	(2) its penetration value is 10mm
		(3) its penetration value is 8 to 10mm	(4) its penetration value is 8 to 10cm
			,
	3.	The alligator cracking in bituminous pay	rement is mainly due to:
	•	(1) inadequate wearing course	
		(2) inadequate thickness of sub base con	
		(3) use of excessive bituminous materia	
		(4) fatigue arising from repeated stress	applications
	4.	In the Los Angeles Abrasion Test on ag 50rpm, the abrasion value will:	gregate, if the speed of the drum is increased to
		(1) Remain unchanged	(2) be unpredictable
		(3) increase	(4) decrease
	5.		ay traffic cross at an uncontrolled intersection, or conflict points would be:
		(1) 32 (2) 24	(3) 16 (4) 4
	6.	If a descending gradient of 1 in 25 meet valley curve required for head light dista	s an ascending gradient of 1 in 40, the length of the of 100m will be:
		(1) 110m (2) 130m	(3) 210m (4) 230m
	7.	For carrying out bituminous patch wo binder is:	rk during the rainy season, the most suitable
		(1) Road tar	(2) Hot bitumen
		(3) Cutback bitumen	(4) Bituminous emulsion
	_		by fully jamming the brakes. The skid marks
	8.	Measured 9.8m. The average skid resista	nce coefficient will be:
		(1) 0.25 (2) 0.4	(3) 0.5 (4) 0.7
	9.	The general requirement in constructing layer of reinforcement:	a reinforced concrete road is to place a single
		(1) Near the top of slab	(2) Near the bottom of slab
		(3) At the middle of slab	(4) Equally distributed at the top and bottom
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•	10	incasured is record	ound to be 0 lm too sided as 600m, the actu	hort throughout the nual distance will be:	neasurement. If the distance
		(1) 598m	(2) 599m	(3) 601m	(4) 602m
	11	plotting and check will be the most a	king the work in the	map of an area in a field itself. Which of	n magnetic zone by directly one of the following survey
		(1) Chain	(2) Theodolite	(3) Plane table	(4) Compass
	12	curve passing thro	BC $b = 300m$ and an ugh the points A, B a	ngle ABC = 60° , the and C will be:	en the radius of the circular
		(1) 86.60m	(2) 100m	(3) 126.60m	(4) 173.20m
	13.	Which one of the f(1) Spheroid(3) Prolate sphero	following closely rep	resents the shape of t (2) Oblate spheroi (4) Ellipsoid	
	14.	When the latitude		clination is 17°30'S, (2) 73°30'	the 'zenith distance' at the
	15.	If the cross sectio 30m ² , respectively, (1) 5300m ³	nal area of an emba the volume of emba (2) 8300m ³	ankment at 30m into	ervals are 20,40,60,50 and of prismoidal rule, is: (4) 9800m ³
	16.	The main plate of vernier coincides of seconds) of the trans	exactly with 59 div	into 1080 equal divisions of the main	visions, 60 divisions of the plate. The least count (in
		(1) 5	(2) 10	(3) 15	(4) 20
	17.	photograph. The fo the area having an e	cal length of the car elevation of 1000m w	nera is 21 cm. The swill be:	sures 10cm on a vertical scale of the photograph for
		(1) 1:20606	(2) 1:25008	(3) 1:27381	(4) 1:30421
	18.	The minimum disso save the aquatic life	olved oxygen which is:	should always be p	resent in water in order to
		(1) 1ppm	(2) 4ppm	(3) 10ppm	(4) 40ppm
		Septic tank is a:		(a) aquatique to u1-	
-			(b) digestion tank(2) (a) and (b)	(3) (a) and (c)	(1) (b) and (a)
MI		(1) Only (a) PHD/URS-EE-2019/			(4) (b) and (c)
.,,,,,,		LLD, CALCULATION DE	(Original Principles)	(~~~ ×)/ (××)	
					1 150 pt 100 pt

The maximum efficiency of BOD removal is achieved in: (1) aerated lagoons (2) oxidation pond (3) oxidation ditch (4) trickling filter
For the combined sewerage system, egg shaped sewers are preferred because: (1) they offer good flow velocity during the dry weather flow condition (2) they are structurally more stable (3) their maintenance is easier (4) they are economical
Various units in a sewerage treatment are: (a) screening (b) grit removal (c) secondary sedimentation (d) aeration (e) primary sedimentation Their <i>correct</i> order of placement will be: (1) b, a, d, e and c (2) b, a, d, c and e (3) a, b, c, d and e (4) a, b, e, c and d
One litre of sewage, when allowed to settle for 30 minutes gives a sludge volume 27cm ³ . If the dry weight of this sludge is 3.0 grams, the sludge volume index will be: (1) 100 (2) 81 (3) 24 (4) 9
Electrical conductivity of water and total dissolved solids (TDS) are interrelated. The value of electrical conductivity will: (1) increase initially and then decrease with increase in TDS (2) decrease initially and then increase with the increase in TDS (3) increase with the increase in TDS (4) decrease with the increase in TDS
Coal based thermal power stations pollute the atmosphere by adding: (1) NO _x and SO ₂ (2) NO _x , SO ₂ and SPM (3) NO _x , SO ₂ , SPM and CO (4) NO _x , SO ₂ , and CO
Zero hardness of water is achieved by: (1) Using lime soda process (2) Excess lime treatment (3) Ion exchange method (4) Using excess alum dosage I/PHD/URS-EE-2019/(Civil Engineering)-(SET-Y)/(A) P. T. C.

27.	In a water treatment plant, dissolved i	ron and manganese can be removed from water
	by 6K:	
	(1) aeration	(2) aeration and flocculation
	(3) aeration and coagulation	(4) aeration and sedimentation
28.	What is the correct sequence of for chlorination of water in which ammonia	rmation of the following compounds during a is present?
	(a) NCl ₃ (b) NH ₂ Cl Correct order is:	(c) NHCl ₂
	(1) a, b and c (2) b, a and c	(3) c, a and b (4) c, b and a
29.	Consider the following activities of a ho	ousing project :
	(a) Flooring	(b) Wall plastering
	(c) Conceal wiring	(d) Fixing door window frames
	(e) Fixing door window shutters	
	The <i>correct</i> logical sequence of above a	
	(1) a, b, c, d and e	(2) e, d, c, b and a
	(3) d, c, b, e and a	(4) b, c, d, e and a
30.		
		(1) 11= K
31.	lack time is associated with:	(2) A real activity
	(1) Dummy activity(3) An event	(2) A real activity(4) Both event and real activity
D	·	• . • . • •
32.	In PERT analysis, the time estimates o follow:	f activities and probability of their occurrence
	(1) Normal distribution curve	(2) Bionomial distribution curve
	(3) Poisson's distribution curve	(4) β-distribution curve
33.	What is the time by which the compaffecting the start of succeeding activitie	letion of an activity can be delayed without s called?
	(1) Free float	(2) Interfering float
	(3) Independent float	(4) Total float
34.	Which one of the following is NOT an ex-	cavating and moving type equipment?
	(1) Bulldozer (2) Dump truck	(3) Clamshell (4) Scraper
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35.	Match LIST-I with LIST-II and select the correct answer using the codes given below
	in the lists: LIST-I LIST-II
,	(a) Cube specimen (i) Pin Vibrator
	(b) Pavement slab . (ii) Form Vibrator
	(c) Heavily reinforced column (iii) Table Vibrator
	(d) Mass concrete in bridge piers (iv) Screed Vibrator
• •	(v) Manual compaction
	Select the <i>correct</i> answer:
	(a) (b) (c) (d)
	(1) iv iii ii i
	(2) iii iv ii i
	(3) ii iii iv v
	(4) iii iv i v
00	The function of coping is to serve as a:
36.	(1) Shade against solar radiation
	and the compart a structural member
	(2) Projection from a wall to support a structural member (3) Ornamental course between lintel and roof level
	(4) Covering to the wall to throw off water
	1 1 1 - 64h a fallowing cement is hest suited?
.37.	
	(1) Ordinary Portland cement (2) Rapid Hardening cement (3) Blast furnace slag cement (4) Low heat Portland cement
	(5) Diast turner and
38.	Consider the following statements.
	Cement mortars richer than 1:3 are not used in masonry work because:
	(a) There is no gain in strength of masonry
, ,	(b) There is high shrinkage
	(c) They are prone to segregation
	Which of these statements are <i>correct</i> : (2) (a) and (b) (d) (d) (d) (a) and (b)
	(1) (a), (b) and (c) (2) (b) and (c) (3) (a) and (c) (4) (a) and (b)
39.	Slump and compaction factors are two different measures of workability of concrete.
	For a slump of 0 to 20mm, what is the equivalent range of compaction factor? (1) 0.70-0.80 (2) 0.80 - 0.85 (3) 0.85 - 0.90 (4) 0.90-0.95
	(1) 0.70-0.80 (2) 0.80 - 0.03
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40	The fineness modulus of fine aggregate is 2.78 and of coarse aggregate is 7.82 and the desired fineness modulus of mixed aggregate is 6.14. What is the amount of fine aggregate to be mixed with one part of coarse aggregate?				
	(1) 55%	(2) 50%	(3) 45%	(4) 40%	
41	 Modular bricks are mortar between jo of brickwork? 	e of nominal size 20 ints. What is the nur	\times 10 \times 10 cm and 2 mber of modular bric	20% of the volume is lost in the cks required per cubic metre	
	(1) 520	(2) 500	(3) 485	(4) 470	
42	 As per Indian Sta should be 	andards, the minima	um compressive stre	ength of a first class brick	
	$(1) 75 kg/cm^2$	(2) 90kg/cm ²	$(3) 100 \text{kg/cm}^2$	(4) 125kg/cm ²	
43	be connected):	should not be more t	than (t=least thicknes	ss of the wooden member to	
-	(1) t/6	(2) t/8	(3) t/10	(4) t/12	
44	The moisture contour (1) 15-25%	ent in a structural tin (2) 10-20%	nber should be: (3) 5-10%	(4) less than 5%	
45		t of structural steel is (2) 0.50-0.75%	· · · · · · · · · · · · · · · · · · ·	(4) 0.10-0.25%	
46	Which one of the f(1) Mild steel(3) Manganese ste	following types of sto	eel is used in the man (2) Cast steel (4) Bessemer stee		
47.	For sand of unifor densest states is:	m spherical particle	s, the ratio of void 1	ratios in the loosest and the	
	(1) 3.0	(2) 2.6	(3) 2.0	(4) 1.5	
48	The correct order of (1) sand, silt, clay (3) silt, sand, clay	· ·	area of the soil is: (2) sand, silt, coll (4) clay, silt, sand	oids and clay I and colloids	
49	(1) Failure plane is(2) Satisfactory state(3) Pore pressures	s not the weakest pla rain levels cannot be developed cannot be	ar parameters of a claine maintained e measured	argument that direct shear ayey soil?	
MPF	(4) Adequate cons I/PHD/URS-EE-2019	solidation cannot be of the control			
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50.	The upstream slope of an earth dam unde	er steady seepage condition is:
	(1) phreatic line	(2) flow line
4.	(3) seepage line	(4) equipotential line
51.	Undisturbed soil samples are required to	conduct:
	(1) Hydrometer test	(2) consolidation test
	(3) Shrinkage limit test	(4) specific gravity test
52.	When the degree of consolidation is 50%	the time factor is about
	(1) 0.2 (2) 0.5	(3) 1.0 (4) 2.0
53.	Which one of the following, gives the cosample?	orrect decreasing order of the densities of a soil
	(1) saturated, submerged, wet, dry	(2) saturated, wet, submerged, dry
	(3) saturated, wet, dry, submerged	(4) dry, wet, submerged, saturated
54.	Consider the following types of soil tests (a) California bearing ratio (b) Consolidation (c) Unconfined Compression The soil tests required to be done in the call (1) a, b and C (2) a and b	
55.		
55.	The direction of seepage during seepage (1) Along the direction of gravity (2) Parallel to equipotential lines	unough an earth mass is .
	(3) Perpendicular to the equipotential lin	nes
	(4) Perpendicular to stream lines	· · · · · · · · · · · · · · · · · · ·
56.	The difference between maximum void i	ratio and minimum void ratio of a sand sample apple is 66.60% at a void ratio of 0.40, the void ll be:
	(1) 0.40 (2) 0.60	(3) 0.70 (4) 0.75
57.	Which one of the following parameters friction of a sandy soil?	can be used to estimate the angle of internal
	(1) density index	(2) particle size
	(3) roughness of particle	(4) particle size distribution
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58.	The limit of the val (1) 0.60-0.75	ues of the coefficien (2) 0.76-0.80	at of discharge of ver (3) 0.81-0.94	nturimeter is between: (4) 0.95-0.99
59.	Consider the follow (a) Blood (c) Molasses (e) Kerosene	ving fluids :	(b) Glycerine(d) Slurry of clay	in water
	Among the above, (1) b, d and e	non-Newtonian flui (2) b, d and c	ds will include: (3) a, c and d	(4) a, d and e
60.	(1) Specific energy(2) For a given specifical velocity	ecific energy, two do ty occurs at Froude	above the floor of ar epths exist and these	are called alternate depth
61.	A racing car with uniform accelerate assume a slope of (1) 45°	ion equal to 'g'. The	el tank moves in the free surface of the	the horizontal direction at a liquid fuel in the tank will (4) 15°
62.	(1) For water has closed		he valve at the end	of a pipeline must be fully
	\ <i>\</i>		on when there is unst ugh elastic media giv	eady flow in a pipe es rise to water hammer
63.	A 4 hour rainfall in successive 2 ho off volume in ha-	our unit periods. Ass	Okm ² produces rainf numing the Φ index o	fall depth of 6.2cm and 5.0cm of soil to be 1.2 cm/hr, the ru
	(1) 22 (3) 16		(2) 2200(4) 1600	
64	 A channel design unity. The hydrau 	ed by Lacey's theory llic mean radius will	be:	y of one m/s. The silt factor
	(1) 2.5m (3) 1m	6 6	(2) 2m (4) 0.5m	He is a segion of

65	5. A pumped sto	orage plant is a:			
	(1) High head		(2) Run-off river plant		
	(3) Peak load	l plant	(4) Base load	-	•
66	6. Probability of	a 10 year flood to occ	cur at least once in t	the next 4 years is:	
	(1) 25%	(2) 35%	(3) 50%	(4) 60%	
67	A motor shaft , switched off a would be :	rotating with a speed and stops in 40sec. T	d of 90rpm decelerate he number of revol	ites uniformly when the surface to t	he motor is haft in this
	(1) 10	(2) 20	(3) 30	(4) 40	*
68.	In a particular Poisson's coef	r material, if the mod ficient will be:	dulus of rigidity is	equal to the bulk m	odulus, the
	(1) 1	(2) 0.50	(3) 0.25	(4) 0.125	
69.	(1) Directly proceeds (2) Directly proceeds (2)	in a member is: roportional to strains roportional to changes n of strains as well as n of loads only	,		
70.	load is equal to				Rankine's
	(1) 600kN	(2) 1000kN	(3) 1500kN	(4) 2500kN	
71.	simple support	gth 10m carries a udles. In order that the mole, the supports must (2) 2.07m	aximum bending me be placed from the	noment produced in the	he beam is
72.	(1) Lame's cons	Method: Deflection: Theory of	inder n of beam column	ed ?	
73.	The ratio of the being placed w	e flexural strengths ovith its top and bottoe diagonal horizontally	of two beams squarem sides horizontal y is:	ly and the second be	
			(3) √3	(4) 1√3	
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74.	In a two hinged arch (1) no bending mom (2) uniform bending (3) maximum bending	ent in the arch rib moment in the arch	rib	
	(4) minimum bendir		*	
75.	The absolute maxim to moving udl of 4kl (1) 87.5kNm at the (3) 75kNm at the su	N/m spanning over 5 support		K.
76.	construction defects increase in bending	, the end B is now moment at A is:	reduced to a simple	entire length. Due to some support. The percentage
77.	deflect by δ at the r point will be:	(2) 85AB fixed at A and mid point of AB. Th(2) δ/2	(3) 75carrying a load W and deflection of B due(3) δ	 (4) 50 at the free end is found to e to a load W/2 at the mid (4) 2δ
78.	(1) δ/4If the axial deformation bay portal frame at (1) 3	ation is neglected, v		indeterminacy of a single (4) 6
79.	The moment distrib (1) Force method (3) First order appr		octural analysis falls i (2) Displacement i (4) Flexibility met	method
80.	A propped cantilev B. The moment at t (1) 2M	er beam AB of spar he fixed end A is: (2) M	L is subjected to a (3) 3M/4	moment M at the prop end (4) M/2
81.	The permissible st exceeded by about (1) 50%	•	der wind load condition (3) 25%	tions as per IS:800 can be
82.	The type of stresses (1) pure tension (3) bearing	s induced in the four	ndation bolts fixing a (2) pure compress (4) bending	column to its footing is:
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83.	Steel structures are	ideally suitable for in	mpac	et loads because	they	have high:
	(1) plastic modulus			elastic modulu		
	(3) design stress		(4)	toughness valu	ie	
84.	subjected to:	e coincides with th	ie ce	entroid of the	rivet	group, the rivets are
	(1) Tension only		(2)	Shear only		
	(3) Bending only	*	(4)	Shear as well a	is ten	sion
85.	Steel of yield stren maximum allowabl		en us	ed in a structur	e. W	hat is the value of the
	(1) 96MPa	(2) 120MPa	(3)	240MPa	(4)	400MPa
86.	The slenderness rat	io of lacing bars sho	uld n	ot exceed:		
	(1) 145	(2) 120		100	(4)	75
87.		commonly produced h moment of inertia				ents in frames, floors,
	(1) ISWB-section	(2) ISLB-section	(3)	ISMB-section	(4)	ISHB-section
88.	 Consider the following statements in respect of design of web and flange splices: (a) Flange splice shall be designed for actual bending moment at the section (b) Flange splice shall be designed for actual shear at the section (c) Web splice shall be designed for actual bending moment at the section (d) Web splice shall be designed for actual shear at the section Choose the <i>correct</i> statement: 					
N. ONE	(1) a and c	(2) b and c	(3)	a and b	(4)	a and d
89.	If the shape factor of factor will be:	of a section is 1.5 and	d the	factor of safety	to be	adopted is 2, the load
- The Land	(1) 2	(2) 3	(3)	4	(4)	1.5
90.	In a plastic analys hinges is assumed to		seg	ment between a	any t	wo successive plastic
	(1) A plastic mater	ial	` '	As elastic mate		
	(3) As rigid materia	al	(4)	As inelastic ma	ateria	1
91,	The final deflection due to all loads including the effects of temperature, creep, and shrinkage and measured from the cast level of supports of floors, roofs, and all other horizontal members should NOT exceed:					
	(1) Span/250	(2) Span/300	(3)	Span/350	(4)	Span/400
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 92. In the limit state method of design, the failure criterion for reinforced concrete beam and columns is: (1) Maximum shear stress theory (2) Maximum strain energy theory (3) Distortion energy theory (4) Maximum principal strain theory 93. What should be the minimum grade of concrete in and around sea coast construction per IS:456? (1) M20 (2) M25 (3) M30 (4) M35 94. A reinforced concrete beam of span 4m has a cross section 150mm × 500mm. checked for lateral stability and deflection, the beam will: (1) Fail in both deflection and lateral stability (2) Fail in lateral stability only (3) Fail in deflection only (4) Satisfies the requirements of lateral stability and deflection 95. If b = width, d = effective depth and D = overall depth, the maximum area of compress reinforcement in a beam is: (1) 0.04bd (2) 0.04bD (3) 0.12bd (4) 0.12bD 96. How does the bond stress acts on longitudinal reinforcement in a beam on the interiof bar and concrete? (1) compressive stress (2) tensile stress (3) bearing stress (4) shear stress 97. Lap length of reinforcement in compression shall not be less than: (1) 15Φ (2) 20Φ (3) 24Φ (4) 30Φ 98. The load carrying capacity of a column designed by working stress method is 1000 The collapse load of the column is: (1) 662.5kN (2) 1000kN (3) 1250kN (4) 1500kN 99. Minimum clear covers to the main steel bars (in mm), in slab, beam, column footing, respectively are: (1) 15, 25, 40 and 75mm (2) 10, 15, 20 and 25mm (3) 20, 25, 30 and 50mm (4) 20, 25, 35 and 70mm 100. For prestressed structural elements, high strength concrete is used pr	12	1	3 t 4 t					
 (3) Distortion energy theory (4) Maximum principal strain litery 93. What should be the minimum grade of concrete in and around sea coast construction per IS:456? (1) M20 (2) M25 (3) M30 (4) M35 94. A reinforced concrete beam of span 4m has a cross section 150mm × 500mm. checked for lateral stability and deflection, the beam will: (1) Fail in both deflection and lateral stability (2) Fail in lateral stability only (3) Fail in deflection only (4) Satisfies the requirements of lateral stability and deflection 95. If b = width, d = effective depth and D = overall depth, the maximum area of compress reinforcement in a beam is: (1) 0.04bd (2) 0.04bD (3) 0.12bd (4) 0.12bD 96. How does the bond stress acts on longitudinal reinforcement in a beam on the interior of bar and concrete? (1) compressive stress (2) tensile stress (3) bearing stress (4) shear stress 97. Lap length of reinforcement in compression shall not be less than: (1) 15Φ (2) 20Φ (3) 24Φ (4) 30Φ 98. The load carrying capacity of a column designed by working stress method is 1000 The collapse load of the column is: (1) 662.5kN (2) 1000kN (3) 1250kN (4) 1500kN 99. Minimum clear covers to the main steel bars (in mm), in slab, beam, column footing, respectively are: (1) 15, 25, 40 and 75mm (2) 10, 15, 20 and 25mm (3) 20, 25, 30 and 50mm (4) 20, 25, 35 and 70mm 100. For prestressed structural elements, high strength concrete is used primarily becaus (1) Modulus of elasticity and creep values are higher (2) Higher modulus of elasticity and low creep 	92.	In the limit state method of design, the and columns is:						
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The collapse load of the column is: (1) 662.5kN (2) 1000kN (3) 1250kN (4) 1500kN 99. Minimum clear covers to the main steel bars (in mm), in slab, beam, column footing, respectively are: (1) 15, 25, 40 and 75mm (2) 10, 15, 20 and 25mm (3) 20, 25, 30 and 50mm (4) 20, 25, 35 and 70mm 100. For prestressed structural elements, high strength concrete is used primarily becaus (1) Modulus of elasticity and creep values are higher (2) Higher modulus of elasticity and low creep	97.		(A) A (3					
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100. For prestressed structural elements, high strength concrete is used primarily becaus(1) Modulus of elasticity and creep values are higher(2) Higher modulus of elasticity and low creep	99.	(1) 15, 25, 40 and 75mm	teel bars (in mm), in slab, beam, column an (2) 10, 15, 20 and 25mm					
(4) Both creep and shrinkage are more	100.	For prestressed structural elements, high strength concrete is used primarily because: (1) Modulus of elasticity and creep values are higher (2) Higher modulus of elasticity and low creep (3) Shrinkage is less but creep values are higher						
MPH/PHD/URS-EE-2019/(Civil Engineering)-(SET-Y)/(A)	MPH/	PHD/URS-EE-2019/(Civil Engineerin	g)-(SET-Y)/(A)					

Total No. of Printed Pages: 13

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M.Phil./Ph.D./URS-EE-2019

SET-Y

10038

SUBJECT: Civil Engineering

		JI. 140
Time: 11/4 Hours	Max. Marks : 100 (in words)	Total Questions : 100
Roll No. (in figures)	(III Wolds)	
Name	Father's Name	
Mother's Name	Date of Examination	·
Wiother 5 Hamo		
		(Oirmature of the Invigilator)
(Signature of the Candidate)		(Signature of the Invigilator)

CANDIDATES MUST READ THE FOLLOWING INFORMATION/INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER.

- 1. All questions are compulsory.
- 2. The candidates must return the question booklet as well as OMR Answer-Sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfairmeans / mis-behaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.
- 3. Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.
- 4. Question Booklet along with answer key of all the A, B, C & D code will be got uploaded on the University website after the conduct of Entrance Examination. In case there is any discrepancy in the Question Booklet/Answer Key, the same may be brought to the notice of the Controller of Examination in writing/through E.Mail within 24 hours of uploading the same on the University Website. Thereafter, no complaint in any case, will be considered.
- 5. The candidate must not do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question booklet itself. Answers must not be ticked in the question booklet.
- 6. There will be no negative marking. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.
- 7. Use only Black or Blue Ball Point Pen of good quality in the OMR Answer-Sheet.
- 8. Before answering the questions, the candidates should ensure that they have been supplied correct and complete booklet. Complaints, if any, regarding misprinting etc. will not be entertained 30 minutes after starting of the examination.

MPH/PHD/URS-EE-2019/(Civil Engg.)(SET-Y)/(B)

1.	Modular bricks are of nominal size $20 \times 10 \times 10$ cm and 20% of the volume is lost in mortar between joints. What is the number of modular bricks required per cubic metre of brickwork?				
	(1) 520	(2) 500	(3)	485	(4) 470
2.	should be				gth of a first class brick
	(1) 75 kg/cm2	$(2) 90 kg/cm^2$	(3)	100kg/cm ²	(4) 125kg/cm ²
3.	The nail diameter sibe connected):	hould not be more th	an (1	=least thickness	of the wooden member to
	(1) t/6	(2) t/8	(3)	t/10	(4) t/12
4.	The moisture conte	nt in a structural timb (2) 10-20%		hould be: 5-10%	(4) less than 5%
5.		of structural steel is (2) 0.50-0.75%		0.25-0.50%	(4) 0.10-0.25%
6.	Which one of the form (1) Mild steel (3) Manganese steel	ollowing types of stee	(2)	used in the manu Cast steel Bessemer steel	Yan da a sana
7.	For sand of unifordensest states is: (1) 3.0	m spherical particles (2) 2.6			atios in the loosest and the
8.		of increasing surface			
υ.	(1) sand, silt, clay	and colloids	(2) sand, silt, colloids and clay(4) clay, silt, sand and colloids		
- 7 <u>5</u>	(3) silt, sand, clay,		, ,		
9.	Which one of the following statements provides the best argument that direct she tests are not suited for determining shear parameters of a clayey soil?(1) Failure plane is not the weakest plane				yey soil?
	 (2) Satisfactory strain levels cannot be maintained (3) Pore pressures developed cannot be measured (4) Adequate consolidation cannot be ensured 				
10.	(1) phreatic line	e of an earth dam und	(2)) flow line	
	(3) seepage line		(4) equipotential l	
TPH	PHD/IIRS_FF_201	9//Civil Engineering	7) (9	ET_V)/(R)	P. T. C

- 1 	11. A beam of length 10m carries a simple supports. In order that the least possible, the supports m	e maximum hending	moment produced	in the beam is				
	(1) 1.75m (2) 2.07m	(3) 4.l4m	(4) 5.86m					
1.	(2) Macaulay's Method : Deflec	cylinder ction of beam	hed?					
•	(4) 1111111	y of column on of shafts		-6				
13	being placed with its top and be placed with one diagonal horizon	ottom sides horizonta	are cross section, that ally and the second	ne first beam beam being				
	(1) $\sqrt{2}$ (2) $1\sqrt{2}$	$(3) \ \sqrt{3}$	(4) 1√3	<i>i</i> •				
14 15. 16.	 (1) no bending moment in the arc (2) uniform bending moment in the control of the con	the arch rib the arch rib the crown the crown noment in a simply su over 5m is: (2) 87.5kNm a (4) 75kNm at	at the mid point the mid point					
	increase in bending moment at A is	now reduced to a s	imple support. The	percentage				
	(1) 100 (2) 85	(3) 75	(4) 50					
17.								
	$(1) \delta/4 \qquad (2) \delta/2$	(3) δ	(4) 28					
18.	If the axial deformation is neglected bay portal frame at base:	ed, what is the kinem	atic indeterminacy	of a single				
2	(1) 3	(3) 5	(4) 6					
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19.	The moment distribution method (1) Force method (3) First order approximate met	(2) Displacemen	t method
20.	A propped cantilever beam AB B. The moment at the fixed end (1) 2M (2) M	of span L is subjected to A is: (3) 3M/4	a moment M at the prop end (4) M/2
21.	The final deflection due to all shrinkage and measured from the horizontal members should NO	he cast level of supports of exceed:	es of temperature, creep, and of floors, roofs, and all other (4) Span/400
	(1) Span/250 (2) Span/3	·	
22.	In the limit state method of desand columns is:	•	
	(1) Maximum shear stress theo(3) Distortion energy theory	(4) Maximum pr	rain energy theory rincipal strain theory
23.	What should be the minimum g per IS:456?	14	
	(1) M20 (2) M25	(3) M30 ·	(4) M35
24.	A reinforced concrete beam of checked for lateral stability and (1) Fail in both deflection and (2) Fail in lateral stability only (3) Fail in deflection only (4) Satisfies the requirements of	deflection, the beam will stateral stability of lateral stability and defle	ection
25.	If b = width, d = effective depth reinforcement in a beam is:	and $D = \text{overall depth}$, the	t many the second
	(1) 0.04bd (2) 0.04bl	(3) 0.12bd	(4) 0.12bD
26	of bar and concrete?	on longitudinal reinforcem (2) tensile stres	
	 compressive stress bearing stress 	(4) shear stress	
27	. Lap length of reinforcement in	compression shall not be l	ess than:
	(1) 15Φ (2) 20Φ	(3) 24 \Phi	(4) 30Ф
28	The collapse load of the colum	n is:	
	(1) 662.5kN (2) 1000k	· · · · · · · · · · · · · · · · · · ·	(4) 1500kN
MPI	I/PHD/URS-EE-2019/(Civil Eng	gineering)-(SET-Y)/(B)	P. T. C

29	 Minimum clear covers to the mai footing, respectively are: 	n steel bars (in mm), ir	ı slab, beam, column a	and
	(1) 15, 25, 40 and 75mm (3) 20, 25, 30 and 50mm	(2) 10, 15, 20 and 2 (4) 20, 25, 35 and 7		•
30.	 For prestressed structural elements, (1) Modulus of elasticity and creep (2) Higher modulus of elasticity and (3) Shrinkage is less but creep value (4) Both creep and shrinkage are me 	values are higher I low creep es are higher	used primarily because	:
31.	The transition curve used in the recommendations is: (1) Spiral (3) Cubical parabola	horizontal alignment of (2) lemniscate (4) any of the above		RC
32.	Bitumen of grade 80/100 means: (1) its penetration value is 8mm (3) its penetration value is 8 to 10mm	(2) its penetration van(4) its penetration van		
33.	The alligator cracking in bituminous (1) inadequate wearing course (2) inadequate thickness of sub base (3) use of excessive bituminous mate (4) fatigue arising from repeated stre	course of pavement	o:	
34.	In the Los Angeles Abrasion Test on 50rpm, the abrasion value will: (1) Remain unchanged (3) increase	aggregate, if the speed of (2) be unpredictable (4) decrease	the drum is increased to	0
35.	When two roads with two lane, two the total number of major potential ma (1) 32 (2) 24	jor conflict points would		,
36.	If a descending gradient of 1 in 25 me valley curve required for head light dis (1) 110m (2) 130m	stance of 100m will be:	of 1 in 40, the length of 230m	f
MPH/I	PHD/URS-EE-2019/(Civil Engineerin		The second second	

37.	For carrying out bituminous patch work binder is:		k during the rainy season, the most suitable		
	(1) Road tar	(2) H	lot bitumen		
	(3) Cutback bitumen	(4) B	Bituminous emu	lsion -	
38.	A vehicle was stopped in two seconds measured 9.8m. The average skid resista				d marks
	(1) 0.25 (2) 0.4	(3) 0		(4) 0.7.	
39.	The general requirement in constructing layer of reinforcement:	g a reir	nforced concrete	e road is to place	a single
	(1) Near the top of slab	(2) 1	Near the bottom	of slab	
	(3) At the middle of slab	(4) E	Equally distribut	ted at the top and	bottom
40.	A 30m chain is found to be 0 lm too she measured is recorded as 600m, the actual	al dista	ince will be:		distance
	(1) 598m (2) 599m	(3)	501m	(4) 602m	
41.	Undisturbed soil samples are required to	o condi	uct:		
	(1) Hydrometer test	(2)	consolidation te	st	
	(3) Shrinkage limit test	(4) s	specific gravity	test	
42.	When the degree of consolidation is 509	%, the	time factor is al	oout:	
	(1) 0.2 (2) 0.5	(3)		(4) 2.0	:
43.	Which one of the following, gives the cample?	correct	decreasing orde	er of the densities	of a soil
	(1) saturated, submerged, wet, dry	(2)	saturated, wet, s	submerged, dry	
	(3) saturated, wet, dry, submerged	(4)	dry, wet, subme	rged, saturated	
44.	Consider the following types of soil tes	ts:	·		
	(a) California bearing ratio				
	(b) Consolidation				
	(c) Unconfined Compression				
	The soil tests required to be done in the	case t	undisturbed sam	ples include:	
	(1) a, b and C (2) a and b		a and c	(4) b and c	
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45.	The direction of seepage during seepag	ge through an earth	mass is:
	(1) Along the direction of gravity		
	(2) Parallel to equipotential lines		
	(3) Perpendicular to the equipotential	lines	
	(4) Perpendicular to stream lines		
46.	The difference between maximum voi is 0.30. If the relative density of this s ratio of this sample at its loosest state v	sample is 66.60% a	
	(1) 0.40 (2) 0.60	(3) 0.70	(4) 0.75
47.	Which one of the following parameter friction of a sandy soil?	ers can be used to	estimate the angle of internal
	(1) density index	(2) particle size	
	(3) roughness of particle	(4) particle size	distribution
48.	The limit of the values of the coefficie	ent of discharge of v	renturimeter is between:
	(1) 0.60-0.75 (2) 0.76-0.80	(3) 0.81-0.94	(4) 0.95-0.99
49.	Consider the following fluids:		
	(a) Blood	(b) Glycerine	
	(c) Molasses	(d) Slurry of cla	ay in water
	(e) Kerosene		
	Among the above, non-Newtonian flu	ids will include:	
	(1) b, d and e (2) b, d and c	(3) a, c and d	(4) a, d and e
50.	Which one of the following statement	is NOT correct?	
	(1) Specific energy is the total energy		an open channel
	(2) For a given specific energy, two d		
	(3) Critical velocity occurs at Froude	number = 1	
	(4) Velocity of flow is critical at max	imum specific energ	gy
51.	A racing car with partially filled fu uniform acceleration equal to 'g'. The assume a slope of:		· · · · · · · · · · · · · · · · · · ·
	(1) 45° (2) 30°	(3) 25°	(4) 15°
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02.	Willou one of t	me following statem	ient is NOT correct?	``			
	(1) For water closed	hammer to develop	p, the valve at the	end of a pipeline must	be fully		
	(2) Fall of prohammer	essure due to decre	ase in velocity resu	Its in the phenomenon	of wate		
	(3) Water han	nmer occurs in a situ	ation when there is u	insteady flow in a pipe			
				gives rise to water hami	mer		
53.	3. A 4 hour rainfall in a catchment of 250km^2 produces rainfall depth of 6.2cm and 5.0c in successive 2 hour unit periods. Assuming the Φ index of soil to be 1.2 cm/hr, the r off volume in ha-m will be:						
	(1) 22	· .	(2) 2200				
	(3) 16		(4) 1600		٠		
54.		igned by Lacey's the raulic mean radius w	-	city of one m/s. The silt	factor is		
	(1) 2.5m	•	(2) 2m				
•	(3) 1m		(4) 0.5m				
55.	A pumped stor	age plant is a:					
	(1) High head		(2) Run-off ri	ver plant			
•	(3) Peak load		(4) Base load	•			
			• •	· · ·			
56.			cur at least once in th	-			
	(1) 25%	(2) 35%	(3) 50%	(4) 60%	g = 1		
57.				es uniformly when the nations made by the shaft			
	(1) 10	(2) 20	(3) 30	(4) 40			
58.	In a particular Poisson's coeff		dulus of rigidity is o	equal to the bulk modul	us, the		
	(1) 1.	(2) 0.50	(3) 0.25	(4) 0.125			
59.	Strain energy in	n a member is:					
		oportional to strains		e transport of the second			
		oportional to change	s in strains				
		of strains as well as					
	(4) A function		31103303				
	(T) It function	or rough only					
MPH/	PHD/URS-EE-2	2019/(Civil Engineer	ring)-(SET-Y)/(B)		P. T. O.		

60.	The 'Euler's load' for a G	column is 1000kN	I and crushing load	is 1500kN. The Rankine's
00.	load is equal to : (1) 600kN (2)	1000kN	(3) 1500kN	(4) 2500kN
61.	For the combined sewer (1) they offer good flow (2) they are structurally (3) their maintenance is (4) they are economical	v velocity during more stable s easier	shaped sewers are protected the dry weather flow	referred because: w condition
62.	Various units in a sewer (a) screening (b) grit removal (c) secondary sediment (d) aeration (e) primary sedimentat Their <i>correct</i> order of p (1) b, a, d, e and c (2)	tation tion placement will be	:	(4) a, b, e, c and d
63.	One litre of sewage, very 27cm ³ . If the dry weigh (1) 100 (2)	when allowed to ht of this sludge is) 81	settle for 30 minus 3.0 grams, the slud (3) 24	tes gives a sludge volume ge volume index will be: (4) 9
64.	Electrical conductivity value of electrical cond (1) increase initially at (2) decrease initially at (3) increase with the it (4) decrease with the it	ductivity will: nd then decrease and then increase ncrease in TDS	with increase in TD	(TDS) are interrelated. Th S TDS
65	 Coal based thermal po (1) NO_x and SO₂ (3) NO_x, S02, SPM ar 		(2) NO _x , SO ₂ and (4) NO _x , SO ₂ , an	I SPM
66	(1) Using lime soda p(2) Excess lime treatr(3) Ion exchange met(4) Using excess alur	orocess nent hod n dosage		
MDI	T/PHD/IIRS_FE_2019/0	Civii Engineerin	2)-(SE1-Y)/(B)	

67.	In a water treatmen by 6K:	t plant, dissolved ir	on a	nd manganese c	can be removed from	water
	(1) aeration	•	(2)	aeration and flo	occulation	
	(3) aeration and coa	ngulation		aeration and se		
68.	What is the correction of water	ct sequence of for r in which ammonia	rmat is p	ion of the foll resent?	owing compounds of	during
	(a) NCl ₃ Correct order is:	(b) NH ₂ Cl	(c)	NHCl ₂		
	(1) a, b and c	(2) b, a and c	(3)	c, a and b	(4) c, b and a	
69.	Consider the following	ing activities of a ho	usin	g project :		
	(a) Flooring			Wall plastering		
•	(c) Conceal wiring		(d)	Fixing door win	ndow frames	
	(e) Fixing door win	,				
	The <i>correct</i> logical s	sequence of above a	ctivi	ties will be		·
	(1) a, b, c, d and e			e, d, c, b and a	•	
	(3) d, c, b, e and a			b, c, d, e and a		
70.	duration of T and e project duration thro	each with 'k' as the pugh these activities	stanc	dard deviation of	network, each with f its duration. The or range:	mean verall
	$(1) 4T \pm 6K$	$(2) 4T \pm 4K$	(3)	4T±2k	$(4) 4T \pm k$	
71.	It is required to pro- plotting and checkin will be the most app	ng the work in the f	nap ield	of an area in a itself. Which on	magnetic zone by dir	ectly
	(1) Chain	(2) Theodolite	(3)	Plane table	(4) Compass	
72.	If in a triangle ABC curve passing throug				the radius of the cir	cular
	(1) 86.60m	(2) 100m	(3)	126.60m	(4) 173.20m	
	Which one of the fol (1) Spheroid	lowing closely repre		s the shape of the Oblate spheroid		
	(3) Prolate spheroid		(4)	Ellipsoid		
74.	When the latitude is upper culmination of	56°15' N and declethe star will be:	inati	on is 17°30'S, t	he 'zenith distance' a	t the
	(1) 35°00'		` ′	73°30'		
	(3) 73°45'				le from the data giver	1
PH/F	PHD/URS-EE-2019/((Civil Engineering)	-(SE	T-Y)/(B)	P.	. T. O.

•						
75.	30m ² , respectively, (1) 5300m ³	the volume of embar (2) 8300m ³	1km6 (3)	9300m ³	ervals are 20,40,60,50 ar of prismoidal rule, is: (4) 9800m ³	
76.	The main plate of vernier coincides e seconds) of the tran	exactly with 59 divi	into ision	1080 equal division of the main	risions, 60 divisions of the plate. The least count (ne in
	(1) 5	(2) 10	(3)	15	(4) 20	
77.	photograph. The fo the area having an e	cal length of the can elevation of 1000m w	nera vill b	is 21 cm. The s e:	sures 10cm on a vertice scale of the photograph f (4) 1:30421	al or
	(1) 1:20606	(2) 1:25008	. ,	1:27381	and the second second	
78.	The minimum dissonance save the aquatic life		sho	uld always be pr	resent in water in order	to
	(1) 1ppm	(2) 4ppm	(3)	10ppm	(4) 40ppm	
79.	Septic tank is a:		7			
	(a) settling tank	(b) digestion tank	(c)	aeration tank		
	(1) only (a)	(2) (a) and (b)	(3)	(a) and (c)	(4) (b) and (c)	
80.	The maximum effic	eiency of BOD remov	al is	achieved in:	Sylvani en la sella de la s La sella de la	
	(1) aerated lagoons	•	` '	oxidation pond	contains of the	
	(3) oxidation ditch		(4)	trickling filter		
81.	The permissible streexceeded by about :		er wi	ind load condition	ions as per IS:800 can l	be
	(1) 50%	(2) 33%	(3)	25%	(4) 10%	
32.	The type of stresses	induced in the found	latio	n bolts fixing a c	column to its footing is:	
	(1) pure tension) W	(2)	pure compression	on	
	(3) bearing		(4)	bending		
83.	Steel structures are	ideally suitable for in				
	(1) plastic modulus		` '	elastic modulus		
	(3) design stress		(4)	toughness value	e	
84.	When the load line subjected to:	e coincides with th	e ce	entroid of the ri	rivet group, the rivets as	re
	(1) Tension only		(2)	Shear only		
	(3) Bending only		(4)	Shear as well as	s tension	

	2.17	and the second second						
85.	Steel of yield streng maximum allowable (1) 96MPa	gth 400MPa has e tensile strength (2) 120MPa	:	sed in a structu 240MPa	re. What is the value of the (4) 400MPa			
86.	The slenderness rati	•			(+) +001vii a			
	(1) 145	(2) 120°		100	(4) 75			
87.	beams, etc with mg	ii inoment of iner	tia abou	it x-axis designa	l elements in frames, floors, ated? (4) ISHB-section			
88.	 (1) ISWB-section (2) ISLB-section (3) ISMB-section (4) ISHB-section Consider the following statements in respect of design of web and flange splices: (a) Flange splice shall be designed for actual bending moment at the section (b) Flange splice shall be designed for actual shear at the section (c) Web splice shall be designed for actual bending moment at the section (d) Web splice shall be designed for actual shear at the section Choose the <i>correct</i> statement: (1) a and c (2) b and c (3) a and b (4) a and d 							
89.	If the shape factor of factor will be: (1) 2			factor of safety	(4) a and d to be adopted is 2, the load (4) 1.5			
90.	In a plastic analyshinges is assumed to (1) A plastic mater (3) As rigid material	o deform as :	(2)	ment between As elastic mat As inelastic m	any two successive plastic			
91.	lack time is associate (1) Dummy activity (3) An event			A real activity Both event and				
92.	In PERT analysis, follow: (1) Normal distribut (3) Poisson's distribut	tion curve	(2)	ivities and pro Bionomial dist β-distribution				
93.	What is the time affecting the start of (1) Free float (3) Independent flo	f succeeding activ	ities cal (2)	n of an activit lled? Interfering floa Total float	ty can be delayed without			
94. 1PH/	Which one of the fo (1) Bulldozer	ollowing is NOT at (2) Dump truck	(3)	Clamshell	ng type equipment? (4) Scraper			

in the lists:

		L151-	1				LI	51-11			
	(a) (Cube s	specim	en			(i) Pin	Nibrator			
	(b) I	Pavem	ent sla	b			(ii) Form Vibrator				
	(c) Heavily reinforced column					(iii) Tal	ble Vibrat	or			
	(d) N	Mass o	concret	e in b	ridge pier	rs	(iv) Scr	reed Vibra	ator		
							(v) Ma	nual com	paction	,	
	Selec	et the	correct	answ	er:						
		(a)	(b)	(c)	(d)						t
	(1)	iv	iii	ii	i						
	(2)	iii	iv	ii	i			•			
	(3)	ii	iii	iv	\mathbf{v}						
	(4)	iii	iv	i	V						
96.	The f	inctic	on of co	oning	is to serv	easa.					
					radiation						
			_		vall to sur		structural	member			
					between						
					ll to throv			, , , ,			
07											
97.						onowin		t is best s			
			,		cement	,		oid Harde	_		
	(3) B	iast n	irnace	siag c	ement	,	(4) Lov	w heat Por	rtland ce	ment	
98.					statement						
								asonry wo	ork beca	use:	
			_		strength o	of maso	nry				
			s high s		_						
•	(c) T	hey ar	e pron	e to s	egregation	n					
	Which	n of th	ese sta	teme	nts are co	rrect:					
	(1) (a), (b)	and (c)	(2)	(b) and ((c)	(3) (a)	and (c)	(4) (a) and (b)	
99.	Slump	and	compa	ction	factors a	re two	different	measure	c of	1	
	For a	slump	of 0 to	20m	m, what i	is the ed	quivalent	range of	compact	kability o ion factor	r concrete.
	(1) 0.	70-0.8	30	(2)	0.80 - 0.	85	(3) 0.85	5 - 0.90		0.90-0.95	•
100.	The fi	nenes	s modı	ılus o	f fine agg	gregate	is 2.78 a	nd of coa			00 1 the
					do OI IIII	incu ug	MICHALL	13 U.14.	What is	egate is 7. the amou	82 and the
	-00-06	,	be mi	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	min one p	art of c	ourse age	gregate?		ano amou	int or man
	(1) 55			, ,	50%		(3) 45%	-	(4) 4	10%	
IPH/I	PHD/U	RS-E	E-2019	9/(Ci	vil Engin	eering)	-(SET-Y	')/(B)	100		

95. Match LIST-I with LIST-II and select the correct answer using the codes given below

Total No. of Printed Pages: 13

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M.Phil./Ph.D./URS-EE-2019

SET-Y

SUBJECT: Civil Engineering

		Sr. No
Time : 11/4 Hours Roll No. (in figures)	Max. Marks : 100 (in words)	Total Questions : 100
Name	Father's Name	
Mother's Name	Date of Examination	
(Cignotius of the Condidate)		
(Signature of the Candidate)		(Signature of the Invigilator)

CANDIDATES MUST READ THE FOLLOWING INFORMATION/INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER.

- 1. All questions are compulsory.
- 2. The candidates *must return* the question booklet as well as OMR Answer-Sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfairmeans / mis-behaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.
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- 4. Question Booklet along with answer key of all the A, B, C & D code will be got uploaded on the University website after the conduct of Entrance Examination. In case there is any discrepancy in the Question Booklet/Answer Key, the same may be brought to the notice of the Controller of Examination in writing/through E.Mail within 24 hours of uploading the same on the University Website. Thereafter, no complaint in any case, will be considered.
- 5. The candidate *must not* do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question booklet itself. Answers *must not* be ticked in the question booklet.
- 5. There will be no negative marking. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.
- 7. Use only Black or Blue Ball Point Pen of good quality in the OMR Answer-Sheet.
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	(1) they offer good flow velocity durin(2) they are structurally more stable(3) their maintenance is easier(4) they are economical	g the dry weather flow	v condition
2	 Various units in a sewerage treatment at (a) screening (b) grit removal (c) secondary sedimentation (d) aeration (e) primary sedimentation Their <i>correct</i> order of placement will be (1) b, a, d, e and c (2) b, a, d, c and expressions. 	e:	(4) a, b, e, c and d
3.	One litre of sewage, when allowed to 27cm ³ . If the dry weight of this sludge (1) 100 (2) 81		200 Million (1980) (1980) (1980) (1980) (1980) (1980) (1980) (1980) (1980) (1980) (1980) (1980) (1980) (1980)
4.	Electrical conductivity of water and to value of electrical conductivity will: (1) increase initially and then decrease (2) decrease initially and then increase (3) increase with the increase in TDS (4) decrease with the increase in TDS	with increase in TDS with the increase in	S TDS
5.	Coal based thermal power stations poll (1) NO _x and SO ₂ (3) NO _x , SO ₂ , SPM and CO	(2) NO _x , SO ₂ and (4) NO _x , SO ₂ , and	SPM
6.	Zero hardness of water is achieved by (1) Using lime soda process (3) Ion exchange method	: (2) Excess lime t (4) Using excess	
7.	In a water treatment plant, dissolved in by 6K: (1) aeration (3) aeration and coagulation	(2) aeration and (4) aeration and	flocculation
·H/F	PHD/URS-EE-2019/(Civil Engineerin	g)-(SET-Y)/(C)	P. T. O
			Scanned by CamScanner

1. For the combined sewerage system, egg shaped sewers are preferred because:

2 ef the following compounds dur	mg
8. What is the correct sequence of formation of the following compounds durable relation of water in which ammonia is present?	
(c) NHCl2	
(a) NCI3 (b) Trize	
(1) a, b and c (2) b, a and c (3) C, a and c	
Granidar the following activities of a housing project:	
(a) Flooring (b) Wall place (c) Conceal wiring (d) Fixing door window frames	
(e) Fixing door window shutters	
The correct logical sequence of above activities will be	
(1) a, b, c, d and e (2) e, d, c, b and a	
(2) d c h e and a (4) b, c, d, e and a	h mean
10. There are four consecutive activities in a simple linear network, each with duration of T and each with 'k' as the standard deviation of its duration. The project duration through these activities is likely to be in the range:	e overall
(1) $4T \pm 6K$ (2) $4T \pm 4K$ (3) $4T \pm 2k$ (4) $4T \pm k$	
11. Undisturbed soil samples are required to conduct:	
(1) Hydrometer test (2) consolidation test	
(3) Shrinkage limit test (4) specific gravity test	
1 1 6 1: 1-4: : 500/ the time factor is about :	
(1) 20	
(1) 0.2	
13. Which one of the following, gives the correct decreasing order of the densit sample?	ties of a soil
(1) saturated, submerged, wet, dry (2) saturated, wet, submerged, dry	y
(3) saturated, wet, dry, submerged (4) dry, wet, submerged, saturate	ed
14. Consider the following types of soil tests:	
(a) California bearing ratio	
(b) Consolidation	
(c) Unconfined Compression	
The soil tests required to be done in the case undisturbed samples include	e:
(1) a, b and C (2) a and b (3) a and c (4) b and	C
(1) a and 5 (2) a and 5 (1) 6 and	
PH/PHD/URS-EE-2019/(Civil Engineering)-(SET-Y)/(C)	(A) (1) (8) (4)

	C			3	
	15. The direction (1) Along the (2) Parallel to (3) Perpendicu	of seepage during seepag direction of gravity equipotential lines alar to the equipotential alar to stream lines		s is:	
	is 0.30. If the r	between maximum voi elative density of this s apple at its loosest state	sample is 66.60% at a	void ratio of a sand sample void ratio of 0.40, the void	
	(1) 0.40	(2) 0.60	(3) 0.70	(4) 0.75	
	friction of a san	dy soil?		stimate the angle of internal	
	(1) density inde		(2) particle size	distribution	1
	(3) roughness of		(4) particle size		
	(1) 0.60-0.75	(2) 0.76-0.80	(3) 0.81-0.94	enturimeter is between: (4) 0.95-0.99	
1	19. Consider the fol	lowing fluids:			
	(a) Blood		(b) Glycerine	low in water	
	(c) Molasses		(d) Slurry of c	lay III water	
	(e) Kerosene	Nowtonian fl	uids will include:		
	(1) b, d and e	re, non-Newtonian fl (2) b, d and c	(3) a, c and d	(4) a, d and e	
20.	(1) Specific energy(2) For a given so(3) Critical velocity of f	city occurs at Froud low is critical at ma	gy above the floor of depths exist and the number = 1 eximum specific eximum s	hese are called alternate d	
21.	The permissible exceeded by abou		under wind load	conditions as per IS:80	0 can be
	(1) 50%	(2) 33%	(3) 25%	(4) 10%	
22.	The type of stress		foundation bolts	fixing a column to its for	oting is:
	1) pure tension		(2) pure co	ompression	
	3) bearing		(4) bendir	ng	
		O//Civil Enginee	ring)-(SET-Y)/	(C)	P
PH/PH	ID/UKS-EE-201	9/(Civil Enginee	(1111g) (522 2).		

30.

31.

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	c modulus	(2) elastic modul (4) toughness val	us	
	load line coincides wi	th the centroid of the	rivet group, the rivets a	are
(1) Tension (3) Bendin	n only	(2) Shear only (4) Shear as well	as tension	
25. Steel of yie maximum a	ld strength 400MPa has llowable tensile strength	been used in a structu	re. What is the value of	the
(1) 96MPa	(2) 120MPa	(3) 240MPa	(4) 400MPa	
26. The slendern (1) 145	ess ratio of lacing bars (2) 120	should not exceed: (3) 100	(4) 75	
beams, etc wi	th high moment of iner	tia about x-axis designa	elements in frames, floorated?	ors,
(1) 15 WB-sec	ction (2) ISLB-section	n (3) ISMB-section	(4) ISHB-section	
(a) Flange spli(b) Flange spli(c) Web splice(d) Web spliceChoose the corn		or actual bending moments or actual shear at the seactual bending moments of the sectual shear at the sectual shea	ent at the section ection t at the section ion	
(1) a and c	(2) b and c	(3) a and b	(4) a and d	
9. If the shape factor factor will be:	or of a section is 1.5 ar	nd the factor of safety	to be adopted is 2, the	load
(1) 2	(2) 3	(3) 4	(4) 1.5	
In a plastic analy		e segment between	any two successive pl	astic
(1) A plastic mate	erial	(2) As elastic mate	erial	
(3) As rigid mater	rial	(4) As inelastic ma	aterial	
simple supports. In the least possible, the	order that the maximum order than the maximum order to be presented to to be	mum bending mome		
(1) 1.75m	(2) 2.07m	(3) 4.14m	(4) 5.86m	

23. Steel structures are ideally suitable for impact loads because they have high:

	being placed with its top and bottom placed with one diagonal horizontally is	sides horizontally	and the second beam being	
	(1) $\sqrt{2}$ (2) $1\sqrt{2}$	(3) √3	(4) 1√3	
34.	In a two hinged arch an increase in tem (1) no bending moment in the arch rib (2) uniform bending moment in the arc (3) maximum bending moment at the (4) minimum bending moment at the	ch rib crown		
35.	The absolute maximum bending mom to moving udl of 4kN/m spanning ove (1) 87.5kNm at the support (3) 75kNm at the support	r 3m is:	t the mid point	ie
36.	A beam AB is fixed at both ends and construction defects, the end B is n increase in bending moment at A is: (1) 100 (2) 85	d carries a udl ove	rita antino locallo	ome
37.	A cantilever beam AB fixed at A a deflect by δ at the mid point of AB. point will be:	nd carrying a loo	d W -4 41 C	nd to
	(1) $\delta/4$ (2) $\delta/2$	(3) δ	(4) 2δ	
38.	If the axial deformation is neglecte bay portal frame at base:	d, what is the kir	nematic indeterminacy of a	singl
	(1) 3 (2) 4	(3) 5	(4) 6	
39.	The moment distribution method in (1) Force method (3) First order approximate method	(2) Displa (4) Flexib	cement method ility method	
MPH/I	PHD/URS-EE-2019/(Civil Enginee	ering)-(SET-Y)/((C)	P
				CONTRACTOR OF THE PARTY OF THE

32. Which one of the following pairs is not correctly matched?

(2) Macaulay's Method: Deflection of beam

: Thick cylinder

: Theory of column

: Torsion of shafts

(1) Lame's constants

(3) Euler's load

(4) Eddy's theorem

33. The ratio of the flexural

6	ted to a moment M at the propend
40. A propped cantilever beam AB of spa B. The moment at the fixed end A is: (1) 2M (2) M	(a) 3M/4 (a) M/2 (b) M/2 (b) M/2 (c) M/2 (d) M/2
41. The transition curve used in the harecommendations is: (1) Spiral (3) Cubical parabola	(3) 3M/4 norizontal alignment of highways as per IRC (2) lemniscate (4) any of the above
42. Bitumen of grade 80/100 means: (1) its penetration value is 8 mm (3) its penetration value is 8 to 10mm	(2) its penetration value is 10mm(4) its penetration value is 8 to 10cm
 43. The alligator cracking in bituminous pay (1) inadequate wearing course (2) inadequate thickness of sub base cour (3) use of excessive bituminous material (4) fatigue arising from repeated stress approximation 	irse of pavement I pplications
(1) Remain unchanged (regate, if the speed of the drum is increased to (2) be unpredictable (4) decrease
45. When two roads with two lane, two way the total number of major potential major c (1) 32 (2) 24 (3)	traffic cross at an uncontrolled intersection, conflict points would be: (4) 4
valley curve required for head light distance	
47. For carrying out bituminous patch work of binder is:	
(3) Cutback bitumen (4)	Hot bitumen Bituminous emulsion
48. A vehicle was stopped in two seconds by fineasured 9.8m. The average skid resistance of (1) 0.25(2) 0.4(3)	coefficient will be:
MPH/PHD/URS-EE-2019/(Civil Engineering)-(SE)	(1) 0.7

	1838							
46'	The gene layer of r	eral requestions	uireme	ent in constr	ructing a re	inforced conc	rete road is to pla	7 ce a single
	(1) Near (3) At th	me tor	o of sla	h	(2)	Near the botto		
50.	A 30m e	hain is I is rec	found orded a	to be 0 lm	too short the actual dis	roughout the tance will be :		the distance
51.	lack time	is asse	ociated	with:	, ,		(4) 002111	
	(1) Dum (3) An e	my act				A real activi	ity and real activity	
52.	In PERT follow:	analys	sis, the	time estin			probability of the	eir occurrence
	(1) Norm (3) Poiss			n curve ion curve		Bionomial α β-distribution	distribution curv on curve	e
53.				which the			tivity can be d	elayed without
	(1) Free i) Interfering	float	
	(3) Indep	enden	t float) Total float		
	Which one					vating and n) Clamshell	noving type equ (4) Scrap	
	Match LIS n the lists		vith L	ST-II and	select the	correct ansv	ver using the co	odes given below
	LIST-	-I				LIST-II		
(a) Cube s	specin	nen		(i) Pin Vibra	tor	
(1	b) Pavem	ent sla	ab		(i	i) Form Vib	orator	
((e) Heavil	y rein	forced	column		iii) Table Vil		
((l) Mass c	concre	te in b	ridge pier		iv) Screed V v) Manual c		
Se	elect the a	correc	t answ	/er:				
	(a)	(b)	(c)	(d)				
(1) iv	iii	ii	· i				
(2	2) iii	iv	ii	i				
(3	3) ii	iii	iv	V				
14	n iii	iv	i	V				

 (1) Shade against solar radiation (2) Projection from a wall to support (3) Ornamental course between lintel (4) Covering to the wall to throw off 	a structural member and roof level
57. For marine works, which of the follow(1) Ordinary Portland cement(3) Blast furnace slag cement	ving cement is best suited? (2) Rapid Hardening cement (4) Low heat Portland cement
58. Consider the following statements. Cement mortars richer than 1:3 are no (a) There is no gain in strength of mas (b) There is high shrinkage (c) They are prone to segregation	
Which of these statements are <i>correct</i> (1) (a), (b) and (c) (2) (b) and (c)	: (3) (a) and (c) (4) (a) and (b)
59. Slump and compaction factors are tw For a slump of 0 to 20mm, what is the (1) 0.70-0.80 (2) 0.80 - 0.85	o different measures of workability of concrete. equivalent range of compaction factor? (3) 0.85 - 0.90 (4) 0.90-0.95
60. The fineness modulus of fine aggregate desired fineness modulus of mixed a aggregate to be mixed with one part of (1) 55% (2) 50%	the is 2.78 and of coarse aggregate is 7.82 and the aggregate is 6.14. What is the amount of fine coarse aggregate? (3) 45% (4) 40%
61. It is required to produce a small scale plotting and checking the work in the will be the most appropriate:	map of an area in a magnetic zone by directly field itself. Which one of the following surve
	(3) Plane table (4) Compass ngle ABC = 60°, then the radius of the circu
62. If in a triangle ABC $b = 300$ m and are curve passing through the points A, B a	and C will be:
(1) 86.60m (2) 100m	(3) 126.60m (4) 173.20m
63. Which one of the following closely repr	resents the shape of the earth?
(1) Spheroid	(2) Oblate spheroid
(3) Prolate spheroid	(4) Ellipsoid
MPH/PHD/URS-EE-2019/(Civil Engineering	;)-(SET-Y)/(C)

C

81. The final deflection due to all loads including the effects of temperature, creep, and shrinkage and measured from the cast level of supports of floors, roofs, and all other horizontal members should NOT exceed:

(1) Span/250

(2) Span/300

(3) Span/350

(4) Span/400

82. In the limit state method of design, the failure criterion for reinforced concrete beams and columns is:

(1) Maximum shear stress theory

(2) Maximum strain energy theory

(3) Distortion energy theory

(4) Maximum principal strain theory

83. What should be the minimum grade of concrete in and around sea coast construction as per IS:456?

(1) M20

(2) M25

(3) M30

(4) M35

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84.	checked for lateral stability on 1 1 7 and 1					
	(2) Fail in lateral stability only					
	(3) Fail in deflection only (4) Satisfies the requirement					
85.	(4) Satisfies the requirements of lateral stability and deflection If b = width, d = effective depth and D = overall depth, the maximum area of compressive reinforcement in a beam is:					
	(1) 0.04bd (2) 0.04bD (3) 0.12bd (4) 0.12bD					
86.	How does the bond stress acts on longitudinal reinforcement in a beam on the interface of bar and concrete?					
	 (1) compressive stress (2) tensile stress (3) bearing stress (4) shear stress 					
87.	Lap length of reinforcement in compression shall not be less than : (1) 15Φ (2) 20Φ (3) 24Φ (4) 30Φ					
88.	The load carrying capacity of a column designed by working stress method is 1000kN. The collapse load of the column is: (1) 662.5kN (2) 1000kN (3) 1250kN (4) 1500kN					
89.	Minimum clear covers to the main steel bars (in mm), in slab, beam, column and footing, respectively are: (1) 15, 25, 40 and 75mm (2) 10, 15, 20 and 25mm					
	(3) 20, 25, 30 and 50mm (4) 20, 25, 35 and 70mm					
90.	For prestressed structural elements, high strength concrete is used primarily because: (1) Modulus of elasticity and creep values are higher					
	 (2) Higher modulus of elasticity and low creep (3) Shrinkage is less but creep values are higher (4) Both creep and shrinkage are more 					
91.	A racing car with partially filled fuel tank moves in the horizontal direction at a uniform acceleration equal to 'g'. The free surface of the liquid fuel in the tank will assume a slope of:					
	(1) 45° (2) 30° (3) 25° (4) 15°					
PH/F	PHD/URS-EE-2019/(Civil Engineering)-(SET-Y)/(C)					

closed (2) Fall of pressure due to d	coroses in relegity result	s in the phenomenon of water
(3) Water hammer occurs in a (4) Propagation of high pressu	situation when there is ur	nsteady flow in a pipe gives rise to water hammer
02 1 1 barn : C11 :		of soil to be 1.2 cm/hr, the run
(1) 22 (2) 2200	(3) 16	(4) 1600
94. A channel designed by Lacey's a unity. The hydraulic mean radius	theory has a mean velocis will be:	
(1) 2.5m (2) 2m	(3) 1m	(4) 0.5m
95. A pumped storage plant is a:		
(1) High head plant(3) Peak load plant	(2) Run-off riv (4) Base load p	
96. Probability of a 10 year flood to o	occur at least once in the	e next 4 years is:
(1) 25% (2) 35%	(3) 50%	(4) 60%
97. A motor shaft rotating with a spec switched off and stops in 40sec. would be:	ed of 90rpm decelerate The number of revolut	tions made by the shaft in this
(1) 10 (2) 20	(3) 30	(4) 40
98. In a particular material, if the more Poisson's coefficient will be:	dulus of rigidity is e	qual to the bulk modulus, the
(1) 1 (2) 0.50	(3) 0.25	(4) 0.125
99. Strain energy in a member is:		
(1) Directly proportional to strains	.4	
(2) Directly proportional to changes	s in strains	
(3) A function of strains as well as s		
	il CSSCS	
(4) A function of loads only		
0. The 'Euler's load' for a column is 100 load is equal to:	00kN and crushing 1	oad is 1500kN. The Rankine
(1) 600kN (2) 1000kN	(3) 1500kN	(4) 2500kN
/PHD/URS-EE-2019/(Civil Engineering	ng)-(SET-Y)/(C)	
	S/ (- / (-)	

92. Which one of the following statement is NOT correct?

(1) For water hammer to develop, the valve at the end of a pipeline must be fully closed

Total No. of Printed Pages: 13

(DO NOT OPEN THIS QUESTION BOOKLET BEFORE TIME OR UNTIL YOU ARE ASKED TO DO SO) SET-Y

D M.

M.Phil./Ph.D./URS-EE-2019 SUBJECT: Civil Engineering

,		Sr. No.	10040
Time : 1¼ Hours Roll No. (in figures)	Max. Marks : 100 (in words)		Total Questions : 100
Name	Father's Name		
Mother's Name	Date of Examination	125	· · · · · · · · · · · · · · · · · · ·
	,		•
(Signature of the Candidate)		(Signature	of the Invigilator)

CANDIDATES MUST READ THE FOLLOWING INFORMATION/INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER.

- 1. All questions are compulsory.
- 2. The candidates *must return* the question booklet as well as OMR Answer-Sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfairmeans / mis-behaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.
- 3. Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.
- 4. Question Booklet along with answer key of all the A, B, C & D code will be got uploaded on the University website after the conduct of Entrance Examination. In case there is any discrepancy in the Question Booklet/Answer Key, the same may be brought to the notice of the Controller of Examination in writing/through E.Mail within 24 hours of uploading the same on the University Website. Thereafter, no complaint in any case, will be considered.
- 5. The candidate *must not* do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question booklet itself. Answers *must not* be ticked in the question booklet.
- 6. There will be no negative marking. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.
- 7. Use only Black or Blue Ball Point Pen of good quality in the OMR Answer-Sheet.
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	. The final deflection due to all loads including the effects of temperature, creep, and shrinkage and measured from the cast level of supports of floors, roofs, and all other horizontal members should NOT exceed:				
٠.	(1) Span/250	(2) Span/300	(3) Span/350	(4) Span/400	
2	In the limit state me and columns is:(1) Maximum shear(3) Distortion energy	stress theory	failure criterion for a (2) Maximum strain (4) Maximum princ		
3.	per IS:456?			d sea coast construction as (4) M35	
		(2) M25	(3) M30		
4.	A reinforced concre checked for lateral st	•		on $150\text{mm} \times 500\text{mm}$. If	
	(1) Fail in both defle	•		- plant -	
	(2) Fail in lateral sta	12.4			
	(3) Fail in deflection	only			
	(4) Satisfies the requ	irements of lateral s	tability and deflection	n	
5.	If b = width, d = effect reinforcement in a be	_	overall depth, the max	imum area of compressive	
	(1) 0.04bd ((2) 0.04bD	(3) 0.12bd	(4) 0.12bD	
6.	How does the bond st of bar and concrete?	tress acts on longitu	dinal reinforcement i	n a beam on the interface	
	(1) compressive stres	SS	(2) tensile stress		
	(3) bearing stress		(4) shear stress		
7.	Lap length of reinforce	cement in compressi	on shall not be less th	nan :	
-	$(1) 15\Phi \qquad \qquad (2)$	2) 20Ф	(3) 24Φ	(4) 30Ф	
8.	The load carrying cap The collapse load of the	-	esigned by working	stress method is 1000kN.	
	(1) 662.5kN (2	2) 1000kN ((3) 1250kN	(4) 1500kN	
9.	Minimum clear cover footing, respectively a		l bars (in mm), in	slab, beam, column and	
	(1) 15, 25, 40 and 75n	nm ((2) 10, 15, 20 and 25	mm	
•	(3) 20, 25, 30 and 50n	nm (4) 20, 25, 35 and 70	mm	
MPH/F	MPH/PHD/URS-EE-2019/(Civil Engineering)-(SET-Y)/(D) P. T. O.				
			•		

10.	(1) Modulus of elasticity and creep values are higher				
	(2) Higher modulus of elasticity and lo	•			
	(3) Shrinkage is less but creep values at	re higher			
	(4) Both creep and shrinkage are more				
11.	lack time is associated with:	4			
	(1) Dummy activity	(2) A real activity			
	(3) An event	(4) Both event and real activity			
12.	In PERT analysis, the time estimates of follow:	of activities and probability of their occurrence			
	(1) Normal distribution curve	(2) Bionomial distribution curve			
	(3) Poisson's distribution curve	(4) β-distribution curve			
13.	What is the time by which the compaffecting the start of succeeding activities	eletion of an activity can be delayed without es called?			
	(1) Free float	(2) Interfering float			
	(3) Independent float	(4) Total float			
14.		excavating and moving type equipment?			
	(1) Bulldozer (2) Dump truck	(3) Clamshell (4) Scraper			
15.	Match LIST-I with LIST-II and select in the lists :	the correct answer using the codes given below			
	LIST-I	LIST-II			
	(a) Cube specimen	(i) Pin Vibrator			
	(b) Pavement slab	(ii) Form Vibrator			
	(c) Heavily reinforced column	(iii) Table Vibrator			
	(d) Mass concrete in bridge piers	(iv) Screed Vibrator			
		(v) Manual compaction			
	Select the <i>correct</i> answer:				
	(a) (b) (c) (d)	Part (1999)			
	(1) iv iii i				
	(2) iii iv ii i				
	(3) ii iii iv v				
B.	(4) iii iv i v				

16. The function of coping is to serve as a:(1) Shade against solar radiation

 17. For marine works, which of the following cement is best suited? (1) Ordinary Portland cement (2) Rapid Hardening cement (3) Blast furnace slag cement (4) Low heat Portland cement 18. Consider the following statements. Cement mortars richer than 1:3 are not used in masonry work because:
Cement mortars richer than 1:3 are not used in masonry work because:
(a) There is no gain in strength of masonry(b) There is high shrinkage(c) They are prone to segregation
Which of these statements are <i>correct</i> : (1) (a), (b) and (c) (2) (b) and (c) (3) (a) and (c) (4) (a) and (b)
19. Slump and compaction factors are two different measures of workability of concretion a slump of 0 to 20mm, what is the equivalent range of compaction factor? (1) 0.70-0.80 (2) 0.80 - 0.85 (3) 0.85 - 0.90 (4) 0.90-0.95
 20. The fineness modulus of fine aggregate is 2.78 and of coarse aggregate is 7.82 and desired fineness modulus of mixed aggregate is 6.14. What is the amount of aggregate to be mixed with one part of coarse aggregate? (1) 55% (2) 50% (3) 45% (4) 40%
 A beam of length 10m carries a udl of 20kN/m over its entire length and rests on simple supports. In order that the maximum bending moment produced in the beat the least possible, the supports must be placed from the ends at a distance of: (1) 1.75m (2) 2.07m (3) 4.14m (4) 5.86m
 Which one of the following pairs is not correctly matched? (1) Lame's constants : Thick cylinder (2) Macaulay's Method : Deflection of beam (3) Euler's load : Theory of column (4) Eddy's theorem : Torsion of shafts
 23. The ratio of the flexural strengths of two beams square cross section, the first b being placed with its top and bottom sides horizontally and the second beam be placed with one diagonal horizontally is: (1) √2 (2) 1√2 (3) √3 (4) 1√3
MPH/PHD/URS-EE-2019/(Civil Engineering)-(SET-Y)/(D) P.

	24.	In a two hinged arch an increase in temperature induces:				
		(1) no bending moment in the arch rib				
			(2) uniform bending moment in the arch rib			
			ending moment at t			
		(4) minimum bo	ending moment at the	ne crown		
	25.	The absolute maximum bending moment in a simply supported beam of span 20m due to moving udl of 4kN/m spanning over 5m is:			20m due	
		(1) 87.5kNm at			at the mid point	
		(3) 75kNm at th	e support		the mid point	
	26.	construction def	ixed at both ends a ects, the end B is ing moment at A is	nd carries a udl ov now reduced to a	er its entire length. Due simple support. The pe	to some rcentage
		(1) 100	(2) 85	(3) 75	(4) 50	
	27.	A cantilever beat deflect by δ at the point will be:	nm AB fixed at A he mid point of AE	and carrying a load. The deflection of	d W at the free end is B due to a load W/2 at	found to the mid
		(1) δ/4	(2) δ/2	(3) δ	(4) 28	
	28.	If the axial defo	rmation is neglecte at base:	ed, what is the kine	matic indeterminacy of	a single
		(1) 3	(2) 4	(3) 5	(4) 6	
	29.	(1) Force metho		(2) Displacer		
	30.	A propped canti B. The moment a (1) 2M	lever beam AB of s at the fixed end A is (2) M	span L is subjected s: (3) 3M/4	to a moment M at the j	prop end
				, ,	71547	
	31.	(1) they offer good flow velocity during the dry weather flow condition				
			cturally more stable			
		(3) their mainten				
		(4) they are econ	iomical			
M	PH/F	PHD/URS-EE-20	19/(Civil Engince	ring)-(SET-Y)/(D)		1,10

32.		-	
	(a) screening		,
	(b) grit removal		
	(c) secondary sedimentation		
	(d) aeration		
	(e) primary sedimentationTheir <i>correct</i> order of placement will be :	· · · · · · · · · · · · · · · · · · ·	
	(1) b, a, d, e and c (2) b, a, d, c and e (3)	3) a. b. c. d and e	(4) a. b. e. c and d
33.			
33.	27cm ³ . If the dry weight of this sludge is 3.		
	,	_	(4) 9
34.	Electrical conductivity of water and total	dissolved solids (T	DS) are interrelated. The
04.	value of electrical conductivity will:	dissolved solids (1	Db) the interrelation.
	(1) increase initially and then decrease wit	h increase in TDS	
	(2) decrease initially and then increase wit	h the increase in TI	DS .
	(3) increase with the increase in TDS		
Ý	(4) decrease with the increase in TDS		
35.	Coal based thermal power stations pollute t	the atmosphere by a	dding:
		2) NO _x , SO ₂ and SF	
	(3) NO _x , S02, SPM and CO (4	1) NO_x , SO_2 , and C	0
36.	Zero hardness of water is achieved by:		
	(1) Using lime soda process		
	(2) Excess lime treatment		(A. 18) 184 g
	(3) Ion exchange method	· ,	
	(4) Using excess alum dosage		
37.		and manganese can	be removed from water
,	by 6K: (1) aeration (2)	2) aeration and floc	culation
	(1)	aeration and sedi	- (*) ·
20			200
38.	chlorination of water in which ammonia is p	present?	ving compounds during
) NHCl ₂	
	Correct order is:		
	(1) a, b and c (2) b, a and c (3)) c, a and b ((4) c, b and a
MPH/I	PHD/URS-EE-2019/(Civil Engineering)-(S	ET-Y)/(D)	P. T. O.

39.	99. Consider the following activities of a housing	ng project:
	(a) Flooring (b) Wall plastering
	(c) Conceal wiring (d) Fixing door window frames
	(e) Fixing door window shutters	
	The <i>correct</i> logical sequence of above activ	ities will be
		e, d, c, b and a
	(3) d, c, b, e and a (4)	b, c, d, e and a
40.	 There are four consecutive activities in a duration of T and each with 'k' as the star project duration through these activities is li (1) 4T± 6K (2) 4T± 4K (3) 	dard deviation of its duration. The overal kely to be in the range:
41.	1. A racing car with partially filled fuel tar uniform acceleration equal to 'g'. The free assume a slope of:	
	$(1) 45^{\circ}$ $(2) 30^{\circ}$ (3)) 25° (4) 15°
42.	2. Which one of the following statement is NC	OT correct?
	(1) For water hammer to develop, the va	
	(2) Fall of pressure due to decrease in ve hammer	locity results in the phenomenon of water
	(3) Water hammer occurs in a situation who(4) Propagation of high pressure through el	
43.		produces rainfall depth of 6.2cm and 5.0cm the Φ index of soil to be 1.2 cm/hr, the ru
	(3) 16	1600
44.	4. A channel designed by Lacey's theory has a unity. The hydraulic mean radius will be:	mean velocity of one m/s. The silt factor
) 2m
	(3) 1m) 0.5m
45.	5. A pumped storage plant is a:	
	(1) TT: 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,	Run-off river plant
	(2) Doole lead of all) Base load plant
MPH/	H/PHD/URS-EE-2019/(Civil Engineering)-(S	ET VACE
	Corn Engineering)-(5	E1-1)/(D)

46.	Probability of a 10 (1) 25%	year flood to occur a (2) 35%	t least once in the next (3) 50%	xt 4 years is: (4) 60%
47.				iformly when the motor is made by the shaft in this
	(1) 10	(2) 20	(3) 30	(4) 40
48.	In a particular mat Poisson's coefficien		s of rigidity is equal	to the bulk modulus, the
	(1) 1	(2) 0.50	(3) 0.25	(4) 0.125
49.	(3) A function of st	tional to strains tional to changes in s trains as well as stres		
	(4) A function of lo			
50.	load is equal to:			is 1500kN. The Rankine's
	(1) 600kN	(2) 1000kN	(3) 1500kN	(4) 2500kN
51.	The permissible street exceeded by about :			ons as per IS:800 can be
	(1) 50%	(2) 33%	(3) 25%	(4) 10%
52.	The type of stresses (1) pure tension (3) bearing	induced in the found	dation bolts fixing a compression (4) bending	column to its footing is : on
53.	Steel structures are (1) plastic modulus (3) design stress		npact loads because (2) elastic modulus (4) toughness value	
54.	When the load line subjected to:	e coincides with th		ivet group, the rivets are
	(1) Tension only(3) Bending only		(2) Shear only(4) Shear as well as	s tension
55.	maximum allowable	tensile strength:		e. What is the value of the
	(1) 96MPa	(2) 120MPa	(3) 240MPa	(4) 400MPa
MPH/	PHD/URS-EE-2019/	(Civil Engineering)	-(SET-Y)/(D)	P. T. O

56	The slenderness rat (1) 145	tio of lacing bars sho (2) 120	ould not exceed: (3) 100	(4) 75	
57	beams, etc with hig	commonly produced the moment of inertia		elements in frames, floors, ted?	
58					
59.	factor will be:		(3) a and b I the factor of safety t	(4) a and d to be adopted is 2, the load	
60.	(1) 2In a plastic analysi hinges is assumed to(1) A plastic materi(3) As rigid materia	al	(3) 4segment between an(2) As elastic mater(4) As inelastic mat		
61.	Modular bricks are mortar between join of brickwork?	of nominal size 20 > ts. What is the num	$\times 10 \times 10$ cm and 209	% of the volume is lost in s required per cubic metre	
	(1) 520	(2) 500	(3) 485	(4) 470	
62.	As per Indian Standshould be	dards, the minimun	n compressive streng	gth of a first class brick	
	$(1) 75 kg/cm^2$	$(2) 90 \text{kg/cm}^2$	$(3) 100 \text{kg/cm}^2$	(4) 125kg/cm ²	
63.	The nail diameter should not be more than (t=least thickness of the wooden member to be connected):				
	(1) t/6	(2) t/8	(3) t/10	(4) t/12	
64.	The moisture content (1) 15-25%	in a structural timber (2) 10-20%		(4) less than 5%	
	The carbon content of (1) 0.75-1.00% (* 1	
			(3) 0.25-0.50%	(4) 0.10-0.25%	
MPH/PHD/URS-EE-2019/(Civil Engineering)-(SET-Y)/(D)					

66.	Which one of the following types of ste (1) Mild steel (3) Manganese steel	eel is used in the manufacture of rails? (2) Cast steel (4) Bessemer steel							
67.	densest states is:	, the ratio of void ratios in the loosest and the							
	(1) 3.0 (2) 2.6	(3) 2.0 (4) 1.5							
68.	The correct order of increasing surface a (1) sand, silt, clay and colloids (3) silt, sand, clay, and colloids	area of the soil is: (2) sand, silt, colloids and clay (4) clay, silt, sand and colloids							
69.	Which one of the following statements provides the best argument that direct shear tests are not suited for determining shear parameters of a clayey soil? (1) Failure plane is not the weakest plane (2) Satisfactory strain levels cannot be maintained (3) Pore pressures developed cannot be measured (4) Adequate consolidation cannot be ensured								
70.	The upstream slope of an earth dam und (1) phreatic line (3) seepage line	er steady seepage condition is: (2) flow line (4) equipotential line							
71.	Undisturbed soil samples are required to (1) Hydrometer test (3) Shrinkage limit test	conduct: (2) consolidation test (4) specific gravity test							
72.	When the degree of consolidation is 50% (1) 0.2 (2) 0.5	%, the time factor is about: (3) 1.0 (4) 2.0							
73.	Which one of the following, gives the cosample?	orrect decreasing order of the densities of a soil							
	(1) saturated, submerged, wet, dry(3) saturated, wet, dry, submerged	(2) saturated, wet, submerged, dry(4) dry, wet, submerged, saturated							
74. [,]	Consider the following types of soil tests (a) California bearing ratio (b) Consolidation (c) Unconfined Compression The soil tests required to be done in the confined Compression (1) a, b and C (2) a and b								
MPH/	PHD/URS-EE-2019/(Civil Engineering)	-(SET-Y)/(D) P. T. O.							

75.											
	(1) Along the direction of gravity										
	(2) Parallel to equipotential lines										
	(3) Perpendicular to the equipotential lines										
	(4) Perpendicular to stream lines										
76.	The difference between maximum void ratio and minimum void ratio of a sand sample is 0.30. If the relative density of this sample is 66.60% at a void ratio of 0.40, the void ratio of this sample at its loosest state will be:										
	(1) 0.40 (2) 0.60	(3) 0.70	(4) 0.75								
77.	Which one of the following parameters can be used to estimate the angle of int friction of a sandy soil?										
	(1) density index	(2) particle size									
	(3) roughness of particle	(4) particle size di	stribution								
78.	The limit of the values of the coefficient	t of discharge of vent	turimeter is between :								
. 0.	(1) 0.60-0.75 (2) 0.76-0.80	(3) 0.81-0.94	(4) 0.95-0.99								
_		(5) 0.01-0.54	(1) 0.75-0.77								
79.		,									
	(a) Blood	(b) Glycerine									
. 1.	(c) Molasses	(d) Slurry of clay i	n water								
	(e) Kerosene										
•	Among the above, non-Newtonian fluid	s will include:									
	(1) b, d and e (2) b, d and c	(3) a, c and d	(4) a, d and e								
80.	Which one of the following statement is	NOT correct 2	<u>.</u>								
00.	(1) Specific energy is the total energy a		onan ahama-1								
			•								
	(2) For a given specific energy, two dep		re called alternate depth								
	(3) Critical velocity occurs at Froude nu										
	(4) Velocity of flow is critical at maxim										
81.	The transition curve used in the ho recommendations is:	rizontal alignment	of highways as per IRC								
	(1) Spiral	(2) lemniscate									
	(3) Cubical parabola	(4) any of the about	ve								
82.	Bitumen of grade 80/100 means:										
	(1) its penetration value is 8mm	(2) its penetration	value is 10mm								
	(3) its penetration value is 8 to 10mm	(4) its penetration	value is 8 to 10cm								
MDUA	PHD/URS-EE-2019/(Civil Engineering		. which is one to routh								
717 []	I UD/OKO-PE-2013/(CIAII PIIRIUGGIIIR	/ (OD1-1)/(D)									

MPH/PHD/URS-EE-2019/(Civil Engineering)-(SET-Y)/(D)

Revised Kes

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

Revined Kes

PH.D/URS (CIVIL)

														SET : B
1.	4	16.	4	31.	1	46.	2	61,	4	76.	4	91.	3	======
2.	3	17.	3	32.	3	47.	1	62.	1	77.	3	92.	4	
3.	1	18.	1	33.	4	48.	4	63.	2	78.	2	93.	1	
4.	2	19.	2	34.	3	49.	3	64.	3	79.	3	94.	2	
5.	4	20.	4	35.	1	50.	4	65.	1	80.	1	95.	2	
6.	3	21.	1	36.	2	51.	1	66.	4	81.	2	96.	4	
7.	2	22.	4	37.	4	52.	2	67.	2	82.	1	97.	3	
8.	1	23.	3	38.	3	53.	4	68.	3	83.	4	98.	4	
9.	3	24.	1	39.	1	54.	1	69.	3			99.	1	
10.	4	25.	2	40.	1	55.	3	70.	1	85.	3	100.	2	
11.	2	26.	4	41.	2	56.	2	71.	3	86.	1			
12.	4	27.	3	42.	1	57.	3	72.	4	87.	3			
13.	1	28.	4	43.	3	58.	4	73.	2	88.	4			
14.	3	29.	1	44.	4	59.	3	74.	3	89.	2			
15.	2	30.	2	45.	3	60.	1	75.	1	90.	3			//
													2120	/

PAGE:

2

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1 7	1
Revised	Key

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

Revi	De	0	k	2
				-

		PH	.D/URS (CIVIL)		PAGE: 4	SET : D
1. 1	16. 4	31. 4	46. 2	61. 4	76. 2	91. 3	
2. 4	17. 3	32. 1	47. 3	62. 3	77. 1	92. 4	
3. 3	18. 4	33. 2	48. 4	63. 1	78. 4	93. 2	
4. 1	19. 1	34. 3	49. 3	64. 2	79. 3	94. 3	
5. 2	20. 2	35. 1	50. 1	65. 4	80. 4	95. 1	
6. 4	21. 2	36. 4	51. 2	66. 3	81. 1	96. 4	
7. 3	22. 4	37. 2	52. 1	67. 2	82. 3	97. 3	
8. 4	23. 1	38. 3	53. 4	68. 1	83. 4	98. 2	
9. 1	24. 3	39. 3	54. 2	69. 3	84. 3	99. 3	
10. 2	25. 2	40. 1	55. 3	70. 4	85. 1	100. 1	
11. 3	26. 4	41. 1	56. 1	71. 2	86. 2		
12. 4	27. 3	42. 2	57. 3	72. 1	87. 4		
13. 1	28. 1	43. 4	58. 4	73. 3	88. 3		
14. 2	29. 2	44. 1	59. 2	74. 4	89. 1		1/W/19
15. 2	30. 4	45. 3	60.3	75. 3	90. 1		7. 2