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SET-Y

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Sr. No.					-	-			
	Total	Qι	ies	stic	on	S	:	10	00

Time: 11/4 Hours Roll No. (in figures)	Max. Marks: 100	Total Questions: 100
Name	Date of Birth	
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1.	Which one of the following is true of a statically determinate beam?
	(1) One end is fixed, and the other end is simply supported
	(2) Both the ends are fixed bother noise and a decision of the ends are fixed
	(3) The beam overhangs over two supports
	(4) The beam is supported on three supports
2.	Which of the following are examples of indeterminate structures?
	(i) Fixed beam (i) Fixed beam
	(ii) Continuous beam
	(iii) Two-hinged arch
	(iv) Beam overhanging on both sides
	Select the correct answer using the codes given below:
	(1) (i), (ii) and (iii) only qui no eland (i)
	(2) (i), (ii) and (iv) only
	(3) (i), (iii) and (iv) only
	(4) (ii), (iii) and (iv) only
3.	Which one of the following is correct? A determinate structure:
	(1) Cannot be analyzed without the correct knowledge of modulus of elasticity.
	(2) Must necessarily have roller support at one of its ends.
	(3) Requires only statical equilibrium equations for its analysis.
	(4) Will have zero deflection at its ends.

Leading addition mathed

4.	Match the following:	gis a to save as grain officer out to mor decided
	List - I	List - II
	P. Slope deflection method	I. Force Method
	Q. Moment distribution method	II. Displacement Method
	R. Method of three moments	regular samina is supported on three support
	S. Castigliano's second theorem	with of the leading are examples of in
	(1) P-I, Q-II, R-I, S-II	
	(2) P-I, Q-I, R-II, S-II	mast mountoo) (ii)
	(3) P-II, Q-II, R-I, S-I	dans becambered l'Ain
	(4) P-II, Q-I, R-II, S-I	
5.	The IRC recommendation for warnin	g sign is expressed by:
	(1) Circle on top	glassia dii dii dii
	(2) Triangle on top	
	(3) Rectangle on top	vino (iii bins 'iii) des (iii
	(3) Rectangle on top(4) Square on top	(d) (d) (d) and (iv) only
6.	(4) Square on top	
6.	(4) Square on top	vince (vi) brus (vii) (ii)
6.	(4) Square on topThe displacement method is also refe(1) Minimum strain energy method	erred to as which one of the following?
6.	(4) Square on topThe displacement method is also refe(1) Minimum strain energy method(2) Maxwell-Mohr method	erred to as which one of the following?

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(4) Slope deflection method

7.	What is the shape of influence line diagra- respect of a simply supported beam?	m for the maximum bending moment in
	(1) Rectangular	
	(2) Triangular	mm.Fillvoi (I)
	(3) Parabolic	mm, V. O. (2)
	(4) Circular	mm.V 01 (E)
8.	A three hinged parabolic arch of span 'l' and 'w', then the horizontal thrust at the support is	S:
	(1) $w1^2/8h$	12. The coefficient of friction does not
	(2) wl/h	gnitisin owr lo spalmoint to some far
	(3) wl/8h ²	afine named to secure (ii)
	(4) Whl/8	(c) the time of contact
9.	Centre of mass of a body lies at:	Form of a second to mobile state.
	(1) outside the system/body	1957 o ans (a) bas (d) (s) (1)
	(2) inside the system/body	
	(3) at centre	roomed am (d) bns (n) (f)
	(4) at anywhere either inside or outside	(3) (b) and (c) are consect
10.	Two blocks of masses 5 kg and 6 kg are conplaced on a horizontal surface (frictionless). heavier block. The velocity of the centre of masses 5 kg and 6 kg are conplaced on a horizontal surface (frictionless).	An impulse of 20 m/s velocity is given to a
	(1) 9.09 m/s	antibing origin Of (1)
	(2) 11.09 m/s	y uzhan pengah 25 (C)
	(3) 10.90 m/s	anishing indicated (f)
	(4) 12 90 m/s	gradung sorgab croX (A)

		1 listance of 4 mm in a direction	on, inclined
11.	A force of magnitude 5 N moves throat 60° to the direction of force. The	e magnitude of the	
	is		
	(1) $10\sqrt{3}$ N.mm		
	(2) 0 N.mm		
	(3) 10 N.mm		
	(4) 20 N.mm	The mage to rious offering begins confidence by the confidence of the supple	
12.	The coefficient of friction does not dep	end on:	
	(a) area of interface of two mating sur	faces	
	(b) roughness of two mating surfaces		
	(c) the time of contact		
	Out of these statements:	is soil should be location to still	
	(1) (a), (b) and (c) are correct		
	(2) (a) and (b) are correct	instile the system/body	
	(3) (b) and (c) are correct		
	(4) (a) and (c) are correct	one gal di bine da ci baquin in alboldiy	
13.	The most inconvenient method for par	king is:	ile; Zapii
	(1) 30 degree parking		
	(2) 45 degree parking		
	(3) Parallel parking		
	(4) Zero degree parking		

14.	Temporary hardness in water is due to the presence of:			
	(1) Carbonates	(1) Linear stress to linear strain		
	(2) Sulphates	nieus resuit ar nieus terste.I (C)		
	(3) Chlorides			
	(4) Dissolved carbon dioxide	(4) Shear strass to shear strain		
15.	The factor which influences the design of c	urves is :	19.	
	(1) Permissible centrifugal ratio			
	(2) Speed of vehicle			
	(3) Maximum permissible super elevation		20.	
	(4) All of the above	beni ed rebro mineellet ine ined		
16.	A Circular ring of radius 42 cm is cut and lare in the ratio of 6:5. The small side of the		sides	
	(1) 80 cm	i marie amplicamido algine ofgina ma		
	(2) 30 cm	didentive tength = L. pertinal (1)		
	(3) 120 cm	(2) Effective length = L. permissiste		
	(4) 60 cm	(3) Effective length = 0.8 L. permiss		
	(4) 60 cm	avents odd la sanki (4)		
17.	California Bearing Ratio method for design			
	(1) Traffic intensity			
	(2) Soil Characteristic	$max \ 01 \times 68.8 \ (C)$		
	(5) Property of road material			
	(4) Cement grounding			

18.	Modulus of rigidity is the ration of:				.PT
	(1) Linear stress to linear strain				
	(2) Lateral strain to linear strain				
	(3) Linear stress to lateral strain		anbrodif?		
	(4) Shear stress to shear strain	• Sbiy vil.	mortus be donerd		
19.	What are the dimensions of flexural	rigidity of a beam elen	nent?		
	(1) MT		unso objections		
	(3) ML^3T^{-2}	(4) NAT T-2	efuirior in houng		
20.	If a simply supported beam of spa downward deflection under the load		ad W at the mid		, the
	(1) $WL^3/3El$	(2) WL ³ /8E1			
	(3) WL ³ /48El	(4) 5/384 . WL ³ /.	3El		.0.
21.	For single angle discontinuous strut	is connected to a gusse	t plate with one ri	vet or	nly:
	(1) Effective length = L, permissibl	e strength = 100 percer	nt in the		
	(2) Effective length = L, permissibl	e strength = 80 percent	mo 1001		
	(3) Effective length = 0.8 L, permis	sible strength = 100 pe	rcent		
	(4) None of the above				
22.	The plastic modulus of rectangular l				.77
	(1) $2 \times 10^6 \text{ mm}^3$		That differi		
	(2) $5.33 \times 10^6 \mathrm{mm}^3$		ing that act in line		
	$(3) 8 \times 10^6 \text{ mm}^3$				
	(4) $1.07 \times 10^6 \text{ mm}^3$				

enthanny in amb't (*)

P. T. O.

23.	In cinema theatre, to avoid	reverberation, the longitu	idinal walls should be:	
	(1) Perfectly parallel			
	(2) Converging towards so	creen		
	(3) Converging towards re	ear	STREET, THE LAND LESS OF THE LESS.	
	(4) Should be curvilinear		annimple muitibo-entra (4)	
			rpa universal all le donta	.03
24.	The foundation are placed	below ground level, to inc	crease :	
	(1) Strength	(4) 100/120		
	(2) Workability			
	(3) Stability of structure	dus of rupture (for) and d	then neavied noissen of l'	.08
	(4) All of these			
		(2) (3) (4)	27 T.O == 3.7 (1)	
25.	Gantt charts indicates:	$\nabla A = A \cdot (A)$		
	(1) Comparison of actual p	progress with the schedule	d progress	
	(2) Balance of work to be	done or mabasar brussi	rofaw lot opisy rachemic ediff	
	(3) Progress cost of the pro-	oject (2)		
	(4) Inventory cost			
26.	In the critical path of const	ruction planning, free floa	t can be:	
	(1) Greater than total float		vilated averted (f)	
	(2) Equal to total float		rear reports fructor rest	
	(3) Greater than independe	ent float	Palacorfi belibola (E)	
	(4) Less than independent	float	referr Quality meter	
27.	In PERT analysis, the probis:		ny activity within its expected	l time
	(1) 50%	(2) 100%		
	(3) 75%	(4) 99.9%		

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lattering (Brains'i (1)

(1) di-calcium silicate

	(2) tri-calcium silicate			neerds shaet	vos amigravno.) (S)	
	(3) tri-calcium aluminate				red griggering 3 (6)	
	(4) tetra-calcium aluminate	ferrite			van sei bland (4)	
29.	Which of the following repr	esents hardest	or			
23.	(1) 20//0	ni on Javal ba	(2)	60/70	eng noitabnaol enT	24.
					(I) Strength	
	(3) 80/100		(4)	100/120	(2) Workshills	
30.	The relation between modu (f_{ck}) is:				ristic compressive s	
				$f_{cr} = 0.7 \sqrt{f_{ck}}$		
	(3) $f_{cr} = 0.75 f_{ck}$		(4)	$f_{m} = 0.7/\sqrt{f_{ab}}$	scient abuild Doel)	25.
					de masingmed (F)	
31.	The camber value for water	bound macad	am	roads is :	now to someted (C)	
	(1) 1.7 to 2%		(2)	2 to 2.5%		
	(3) 2.5 to 3%		(4)	3 to 4%	MOD (ROMBYNI (F)	
32.	The degree of compaction for	or sand is usua	ally	defined in term	s of :	40
	(1) Relative density					
	(2) Standard Proctor test				Diamerra Lange (C)	
	(3) Modified Proctor test					
	(4) Nuclear density meter					
33.	A soil deposit having water calculate degree of saturation	er content 15 n.	%,	specific gravit	y 2.5 and voids ra	tio 0.5,
	(1) 50%		(2)	70%		
	(3) 75%		(4)	90%		
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				AND THE RESERVE ASSESSMENT OF THE PARTY OF T		HALLH

28. Heat of hydration in cement is mainly due to:

34.	The self-cleaning velocity for all sewers in	India is:
	(1) 1.0 m/s to 1.2 m/s	(1) Ciruin size is the primary crite grained soil.
	(2) less than 1 m/s	and the state of the college of the
	(2) 1 5 1 - 1 - 2 0 /	Gambiolis ourse distantin (E)
	(4) 3.0 m/s to 3.5 m/s	
35.	The most accurate method of determining th	e water content in a sample of soil is:
	(1) Sand bath method	bodish ascense Method
	(2) Calcium carbide method	bodista assentital Increase Method
	(3) Oven drying Method	
	(4) Alcohol method	bootleM avanaurano3 (4)
36.	A fluoride concentration of in dental caries in children.	water is beneficial for the prevention of
	(1) 0.1 to 0.6 p.p.m.	ma 07.0 (1)
	(2) 0.7 to 1.2 p.p.m.	
	(3) 1.4 to 2.0 p.p.m.	did, The property of soil due to which w
	Variallega / file	vzibupil ()
	(4) 2.5 to 3.0 p.p.m.	Villidamentof C
37.	The softening point of bitumen can be determ	nined by using:
	/4:	but fine only of blad many off (1)
		mi maw skielelase ylikase alī (5) -
	(4) Briquette mould	The off to thought a vote in the

,		
38.	Which one of the following stateme	ents is correct?
	(1) Grain size is the primary crit grained soil.	erion for classification of coarse, as well as fin
	(2) Grain size is the primary criteri	on for classification of coarse-grained soil.
	(3) Plasticity curve classifies coars	
		to classification of coarse-grained soils.
39.	For large cities, the suitable method	d for forecasting population is:
	(1) Arithmetical Increase Method	benitom iben bank (1)
	(2) Geometrical Increase Method	briderius obiet - australa de la dele
	(3) Graphical Method	Leadin W. Sangale movO (Y)
	(4) Comparative Method	bestiman (edeole (F)
40.	In a sieve analysis, 70% of the solution ISS 4.00 mm. Determine e curvature $C_c = 2.00$.	il mass is retained on ISS 2.00 mm and 60% is fine ffective size of the soil mass of its coefficient of
	(1) 0.50 mm	(2) 1.00 mm
	(3) 1.50 mm	(4) 2.00 mm .cm.q.q 5.1 ot 7.11 (5)
41	. The property of soil due to which	water percolates through, it is known as:
	(1) Liquidity	(2) Capillarity
	(3) Permeability	(4) None of the above
42	. Hygroscopic water is defined:	are, The softening point of hattinen can be determin
	(1) The water held by the soil und	der capillary action

(2) The readily available water for the used of plants

(3) The water which is absorbed by the particles of dry soil from the atmosphere

(4) Total water content of the soil filled with water

43.	Traffic density is defined as:		
	(1) The number of vehicles per unit length	dage the bill and and in it	
	(2) The number of vehicle moving in a specific direction per		
	(3) The number of vehicle passing a given point in on hour	oiladgibs vv(I (E)	
	(4) The number of vehicles moving in a specific direction per	hour	
44.	Seepage velocity of water in soil is equal to the:	indensiration of DMI	50
	(1) discharge velocity divided by porosity	ru (V. (1)	
	(4) 4.88 m		
	(2) discharge velocity multiplied by porosity		
	(3) discharge velocity divided by permeability		
	(4) discharge velocity multiplied by permeability		
45.	For a standard compaction test, the mass of hammer and the follows:	e drop of hammer	
	(1) 2.60 kg. and 450 mm		
	(2) 2.00 kg. and 510 mm		
	(3) 4.89 kg. and 310 mm		
	(4) 4.89 kg. and 450 mm		
46.	A phreatic line is defined as the line within a dam section belo		
	(1) Positive equipotential lines		
		AND THE PROPERTY AND ADDRESS OF THE PROPERTY ADDRESS OF THE PROPER	

- (2) Positive hydrostatic pressure
- (3) Negative hydrostatic pressure
- (4) Negative equipotential lines

gread guitans (4)

(4) Theory of clasticity

47.	When the Adiabatic Lapse Rate (ALR) is mo	ore than Environment Lapse Rates (ELR	.)
	then the ELR can be called as:	III BY PALATINE TO WHEN AND THE	
	(1) Super adiabatic lapse rate		
	(2) Sub adiabatic tapse rate	grivenin ologiles in extinuer off (f)	
	(3) Dry adiabatic lapse rate	unisang alambor to radiome off (2)	
	(4) Wet adiabatic rate	arrantesion in maintain (4)	
48.	IRC recommendation for maximum width of	a vehicle is:	
	(1) 1.75 m (2)	2.00 m	
		4.88 m	
	1 /	d brother thought of test (S)	
49.	A clay layer of thickness 10 cm and initial where the final void ratio is 0.2. The settlement of the	oid ratio 0.5 undergoes settlement so the layer in cm is:	12
	(1) 1 (2)		
	(3) 2 (4)	2.5	
	entities of code arts han communication exists to	il no nomenco bashana a 104 .21	
	The shear strength of a soil:		
	(1) is directly proportional to the angle of in	ternal friction of the soil	
	(2) is inversely proportional to the angle of i	nternal friction of soil	
	(3) decreases with increase in normal stress		
	(4) decreases with decrease in normal stress		
		trong and 48.4 (4)	
51.	The earth pressure at rest is calculated by usi	ng:	
	(1) Euler's theory	A phycenic hae is defined as the land	
	(2) Rankine's theory	and I lauratoring ovinion I ('.')	
	(3) Bending theory		
	(4) Theory of elasticity		

annil lamanquanto un sele de

52.	In which method of dispos	sal of municipal solid waste, the	waste is dumped in the	soil?
	(1) Incineration	intré-caut pressure bus s	vitas dod aaster (1)	
	(2) Land filling	imi Manasang dimos svizang bins sv	increase heat arti	
10723	(3) Composting(4) Shredding	arth pressure intensity but the	estatos deliver de	
	ng rimes avizang soubon	ressure at rest for stiff clay is abo		
		(2) 0.5 19 A. (normallo 2) 0.5 (4) 0.8		.88
	(3) 0.6	(4) 0.8		
54.	Aeration of water is done	to remove:		
	(1) Odour	(2) Colour	so animent dirinassor	
	(3) Bacteria's	(4) Turbidity		
55.	Toughness property of an	aggregate can be tested by adopti	inge digeli time (E)	
	(1) Aggregate crushing st	rength test	Hailance of the stability	.08
	(2) Aggregate impact test		onuiq qii2 (1)	
	(3) Los Angeles Abrasion	test	rus latnosmud A. (S)	
	(4) Angularity number		socieme having A (I)	
56.		ncreased density of soil in a fill b		
	by the expulsion of air, is l		In Newtonian fluids,	
	(1) Soil exploration		amogony vitamib (i)	
	(2) Soil stabilization		(2) inversely propon	
	(3) Soil compaction	ales millannolab odi ci ian		
	(4) Consolidation	nigala andla adfidi Lan	Machine (a)	

57.	The effect of cohesion on a so	il is to:		
		ssive earth pressure intensities		
	(2) increase both active and p	assive earth pressure intensities		
	(3) reduce active earth pres	ssure intensity but to increase	passive earth pre	
	(4) increase active earth pro-	essure intensity but to reduce	passive earth pro	Sourc
58.	When was the water (Preventi	on and Pollution) Act enacted by	the Indian Parliam	ent:
	(1) 1970	(2) 1974		
	(3) 1980	(4) 1985		
59.	Terzaghi's bearing capacity fac	ctors are function of		
	(1) C and ϕ ,	(2) Only φ,		
	(3) φ, and depth of foundation	(4) ϕ , depth and wide	th of foundation	
60.	Failure of the stability of slope	es generally occurs along :		
	' ' * *			
	(2) A horizontal surface			
	(3) A curved surface		on circurant (b)	
	aros, at he multipuber sul life e mi	toe to enembed descent unions is an all the second		
61.	In Newtonian fluids, the shear	suess is .		
	(1) directly proportional to the	VISCOSITY		
	(2) inversely proportional to th	ne viscosity		
	(3) directly proportional to the	deformation rate		
	(4) directly proportional to the	shear strain		

62.	Euler number is related to:	al neuron Isler a wil	
	(1) Inertia force to pressure force	kandine, what is the supp	
	(2) Inertia force and elastic force		
	(3) Inertia force and viscous force	m SEI (E)	
	(4) Inertia force and gravity force	in at (E)	
		(4) 56 m	
63.	If the diameter of the capillary tube is doubled, the capilla		
	contended for management of plantic waste:	moosa ton at garaolion	.10
	(1) Doubled	ovskounA (1)	
	(2) Unaffected	Initiating and Life	
		moderness ()	
	(3) Halved		
	(4) One-lourul		
		answolfed our to dead we	50
64.	The unit of dynamic viscosity in MKS system is:	autesang mulozdA ili	
	(1) kgf-sec/m ²	suntennine prostute	
	(2) newton-sec/m ²		
	(3) m ² /sec		
		vino Vi bna I (i)	
	(4) stroke	(L) I and II only	
65	The dimensions of surface tension are:	vino III bna II (E)	
		(4) III and IV only	
	(1) MT^{-2}		
	Then a quidhim to He ion inni	STRAINSCHE SEU AL MARKE	.00
	(2) MT ²		
	(3) MLT^{-2}		
	(4) MLT ²		

66.	For a total reaction time of 2.5 sec, coefficient of friction km/hr, what is the stopping sight distance on a highway?	0.35, design speed	of 8
	(1) 124 m	THE SETTON EDITION (L.)	
	(2) 132 m		
	(1) 7(ne sorot sensui (b)	
	(4) 56 m		
	e capillary tube is doubled, the capillary rise will be:	di lo remont odili	
67.	Following is not recommended for management of plastic w		
	(1) Autoclave		
	(2) Deep burial	harmer is a fill (E)	
	(3) Incineration		
	(4) Hydroclave		
		le molandian	
68.	Which of the following relations are correct?		
	I. Absolute pressure = Atmospheric pressure + Gauge pres		
	II. Absolute pressure = Atmospheric pressure – Vacuum pre	essure	
	III. Absolute pressure = Atmospheric pressure + Vacuum pr	essure	
	IV. Absolute pressure = Atmospheric pressure - Gauge pres		
	(1) I and IV only		
	(2) I and II only	odoma (A)	
	(3) II and III only		
	(4) III and IV only	The anniamental art T	.20
69.	What is the acceptable limit for pH of drinking water?		
	(1) 7.5 - 9.5		
	(2) 9.5 -10.5		
	(3) 5.5 - 7.5		
	(4) 65 95		

saurasang lo vitanaim (1)

(2) Depth of water

(3) Quantity of water

(4) Volume of water

O. County send (1)

(3) less than 4.5

SLOTIN IS KNOWN AS I.

descumbani imU (2)

erons and to anoth (A)

and among senting various (E)

designath (C)

mm 02 (1)

mm 00 (8)

70.	Stoke's law deals with:	The procedures are a measured in terms of T. 2	

- (1) settling of fine particles
- (2) turbulent flow between the parallel plates
- (3) laminar flow between the parallel plates
- (4) laminar flow in the tubes

A rectangular channel section will be most efficient when:

- (1) Hydraulic radius is equal to half the depth of flow
- (2) Hydraulic radius is equal to the depth of flow
- (3) Depth of flow is equal to the bottom width
- The emphical representation of average (4) Depth of flow is equal to half the hydraulic radius

The formula for the head loss in conduits is generally known as (where notations carry their usual meanings):

- (1) Hazen-William's formula
- (2) Manning's formula
- (3) Darcy-Weisbach formula
- (4) Nikuradse formula

$$(1) h_E = V^2/g$$

(2)
$$h_E = V^2/3g$$

(3)
$$h_E = V^2/2g$$

(4)
$$h_E = 2V^2/g$$

- The water is flowing in a pipe of cross-section area 19.625 m² and perimeter 15.7 m. The hydraulic mean diameter is: maleunges on the september (1)
 - (1) 4 m

(2) 5 m

(3) 6 m

75.	The precipitation is meas	ured in terms	of:			di wale silvi	
	(1) Intensity of pressure					lo gridinge (1	
	(2) Depth of water		i lalle			taralidan (L	
	(3) Quantity of water	29/6			oranged tro	O montage !	
	(4) Volume of water						
76.	A rainfall is considered a	cid rain if the	oH of	rainwater is	::snns/b	1.00 11.0000	
	(1) less than 7.0		(2)	less than 5.	6	ailasabyH (i	
	(3) less than 4.5		(4)	less than 3.	0	Silve dy Ff i S	
	The graphical representation infiltration rates over system is known as:	tion of average pecified areas	rainf durin	fall and rain g successiv	fall excess e unit tir	ne intervals o	ll minus
TIED :	(1) Hydrograph			o or explication		and Issues and	
	(2) Unit hydrograph			TOTAL		W-usacH (
	(3) Hyetograph				SILITETE 2	BILLIAN (T	
	(4) None of the above						
78.	The rainfall of five succe and 20 mm respectively estimated as 50 mm/day,	y. If the storr	n los	s rate for	the catch	ment area is	earlier
	(1) 50 mm	Y-V-11 (1)	(2)	60 mm			
	(3) 90 mm		(4)	140 mm			
79.	A device used to control size, collection and dispo		그러워 얼마나 아이들이 되었다.			naller than 10	-micron
	(1) Baffle type separator		(2)	Fabric filte	r		
	(3) Louver type separato	r	(4)	Simple grav	vity settli	ng chambers	

80.	Roughness index of roads is expressed as	incompanie moris to riquiscibalistic 28
	(1) Size of the stone on the pavement	
	(2) Normale on of motale and the	depringent visit (1)
	(2) Number of patches on the pavement	dquagoabyd inni airodaye (2)
	(3) Cumulative deformation of surface p	
		Lorizon avada-e (F)
	(4) Type of road surface	
		granuca Locali (%)
	Direct runoff consists of:	
		Of challets the radius of a rotary enrice for lation as 0.45:
	(1) surface runoff, infiltration and perco	
	(2) overland flow, evapotranspiration as	nd precipitation over stream
	(2) Overland Heavy (4)	in FESS (E)
	(3) overland flow, prompt interflow and	percolation
		: ar abulainpa nA . 38
	(4) surface runoff, prompt interflow and	precipitation over stream
82.	Hydrology deals with:	militure aguitor de (I)
	(1) process of depletion of water resour	ces of land nylrabour royal aldusmragani bilos A. (i)
	(2) process of natural science of water	(4) A large underground water body
	(3) process of various water phases	67. Probiblicary sign is meant to
	(4) all of the above	olandar io beega birqae# (1)
83.	Which of the following is a secondary a	ir pollutant ? ho a man baca ma W (\$)
	(1) Sulphur dioxide	(2) Ozone
	(3) Carbon monoxide	(4) Carbon dioxide

84.	The hydrograph of short duration can be converted into hydrograph of longer duration)1
	by:	
	(1) unit hydrograph	
	(2) synthetic unit hydrograph	
	(3) s-curve method	
	(4) flood routing	
85.	friction as 0.45:	
	(1) 12.73 m (2) 30.5 m (3) 30.5 m	
	(3) 22.34 m	
86.	(3) overland flow, prompt interflow and percolation An aquiclude is:	
	(1) A non-artesian aquifer	
	(2) An artesian aquifer	
	(3) A solid impermeable layer underlying or overlying an aquifer	
	(4) A large underground water body	
87.	Prohibitory sign is meant to:	
	(1) Restrict speed of vehicle	
	(2) Warn road users of certain hazardous conditions	
	(3) Prohibit parking of vehicles (1)	
	(4) Prohibit certain traffic movement	

88.	If the specific capacity of a well is 1.1 under a depression head of 3 m head wi	66 litres/sec, then the discharge from thi	
	(1) 1.66 litre/sec		
	(2) 3.5 litre/sec	money (4)	
	(3) 10.5 litre/sec	The law of the law of the state	
	(4) None of the above	noinghni orail (1)	
		minimant (f) (f)	
89.	The unit of coefficient of transmissibilit	ty is:	
	(1) m ² /s	mobagimi mbining? (4)	
		sqipinum m boomborq dan to mambi adii	
	(2) m/s		
	(3) unit less	miga 0001 (2)	
	$(4) m/s^2$	'm'g108+ (E)	
90.	The yield of a well can be obtained by:	m\n_1001 (4)	
	(1) a pumping test		
	(2) recuperating test		
	(3) a chemical test	pera od yd barinpas satuw to rbycCl (f.)	
	(4) either (1) or (2)	(4) Crop production	

	91.
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	Sludge
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- 3 Chlorination
- 3 Coagulation
- 3 Acration
- 4 Denitrification

92. Trickle irrigation is also known as:

- \equiv Micro irrigation
- (2) Drip irrigation
- 3 Subsurface irrigation
- 4 Sprinkler irrigation

93. The density of ash produced in municipal solid waste is

- (1) 700 kg/m²
- 2 1000 kg/m³
- 3 450 kg/m³
- 4 100 kg/m³
- 94. Delta (A) of a crop means:
- Area under the crop
- 3 Crop period
- 3 Depth of water required by the crop

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4 Crop production

- In rotary intersection the weaving length is :
- Ξ The length between the ends of the channel in islands in front of two consecutive entry and exit
- 3 The perimeter of the center line of the road circumfering the central island
- 3 The distance betwee two opposite roads
- **£** The width of the road between the central island and the channel island
- For irrigation purposes, the pH value of water should be
- \exists Between 3 and 6
- 2 Between 6 and 8.5
- 3 Between 8.5 and 11
- 4 More than 11
- The silt factor in Lacey's theory is given as:
- (1) $f = 4.75 \sqrt{m_r}$
- (2) $f = 7.45 \sqrt{m_r}$
- (3) $f = 1.76\sqrt{m_r}$
- (4) $f = 1.56 \sqrt{m_r}$
- Lining of Irrigation channels
- Ξ May stop leakage water
- 2 Creates water logging in near-by areas
- 3 Both (1) and (2)
- **£** None of the above

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2 R been & population (C)

Homar Smoowing (E)

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99.	Canal falls are provided when the available ground slope is:	

- (1) Flatter than the design bed slope of the canal
 - (2) Flatter than the side slope of the canal (2) The pertuneter of the center line of the read circumfering the contral ralande
 - (3) Steeper than the design bed slope of the canal absorbation own special guarantib off the
 - (4) Steeper than the side slope of the canal (4) The system of the read between the control is and any in change as

Standard EDTA solution is used to determinate the: se. For anigation purposes, the phi value of value should be

- (1) Turbidity in water
- (2) Dissolved oxygen in water
- (3) Residual chlorine in water
- (4) Hardness in water

Total No. of Printed Pages: 25

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PHD-EE-2023-24

SET-Y

Civil Engineering

10010

Cr No

		31.1101
Time: 11/4 Hours	Max. Marks : 100	Total Questions: 100
Roll No. (in figures)	(in words)	
Name	Date of Birth	
Father's Name	Mother's Name	
Date of Examination		
(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 shall be got uploaded on the University Website immediately after the conduct of Entrance Examination. Candidates may raise valid objection/complaint if any, with regard to discrepancy in the question booklet/answer key within 24 hours of uploading the same on the University Website. The complaint be sent by the students to the Controller of Examinations by hand or through email. 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.

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1.	The property of soil due to which	h water percolates through, it is	known as:	
	(1) Liquidity			
	(3) Permeability	(4) None of the above	(2) Positive by	
2.	Hygroscopic water is defined:	ydrostatic pressure thelw monod	(3) Negative hy	
	(1) The water held by the soil u	nder capillary action	(4) Negative ed	
	(2) The readily available water	for the used of plants		
Aud	A LEGISLAND AND THE STREET STREET, THE STREET	d by the particles of dry soil from	the atmosphere	
		oil filled with water as segal oils		
			(2) Sub adiabat	
3.	is defined as .	ric lance rate	(3) Dry adiabat	
	(1) The number of vehicles per	unit length	celoibe tatil (N)	
		ring in a specific direction per lan	e per day	
	(3) The number of vehicle pass	ing a given point in on hour one	l. IRC recommen	8
	(4) The number of vehicles mo	ving in a specific direction per ho	(i) 1.75 m ruc	
4.	. Seepage velocity of water in so	il is equal to the :	(3) 2.44 m	
) that	(1) discharge velocity divided l	by porosity Imagina 01 pagedoids	A clay layer of	
	(2) discharge velocity multiplie	ed by porosity	the final void ra	
	(3) discharge velocity divided	by permeability	(1) 1	
	(4) discharge velocity multiplie	ed by permeability	(3) 2	
5.		t, the mass of hammer and the		re as
	(1) 2.60 kg. and 450 mm	proportional to the angle of inter-	(2) is inversely	
	(2) 2.60 kg. and 310 mm	ith increase in normal suces	(3) decreases w	
	(3) 4.89 kg. and 310 mm	ith decrease in normal stress	(4) decreases w	
	(4) 4 80 kg, and 450 mm			

	to the second se				
6.	A phreatic line is defined as the line within a dam section below which there are :				
	(1) Positive equipotential lines				
	(2) Positive hydrostatic pressure				
	(3) Negative hydrostatic pressure				
	(4) Negative equipotential lines				
7.	When the Adiabatic Lapse Rate (ALR) is more than Environment Lapse Rates (ELR). then the ELR can be called as:				
	(1) Super adiabatic lapse rate				
	(2) Sub adiabatic lapse rate				
	(3) Dry adiabatic lapse rate				
	(4) Wet adiabatic rate				
8.	. IRC recommendation for maximum width of a vehicle is :				
	(1) 1.75 m				
	(3) 2.44 m (4) 4.88 m				
9.	A clay layer of thickness 10 cm and initial void ratio 0.5 undergoes settlement so that the final void ratio is 0.2. The settlement of the layer in cm is:				
	(1) 1 (2) 1.5				
	(3) 2 (4) 2.5				
10.	The shear strength of a soil:				
	(1) is directly proportional to the angle of internal friction of the soil				
	(2) is inversely proportional to the angle of internal friction of soil				
	(3) decreases with increase in normal stress				
	(4) decreases with decrease in normal stress				

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- 11. A rectangular channel section will be most efficient when:
 - (1) Hydraulic radius is equal to half the depth of flow
 - (2) Hydraulic radius is equal to the depth of flow
 - (3) Depth of flow is equal to the bottom width
 - (4) Depth of flow is equal to half the hydraulic radius
- 12. The formula for the head loss in conduits is generally known as (where notations carry their usual meanings):
 - (1) Hazen-William's formula
 - (2) Manning's formula
 - (3) Darcy-Weisbach formula
 - (4) Nikuradse formula
- 13. The loss of energy at the exit from a pipe is given as:

$$(1) h_E = V^2 / g$$

(2)
$$h_E = V^2 / 3g$$

(3)
$$h_E = V^2 / 2g$$

$$(4) h_E = 2V^2/g$$

- 14. The water is flowing in a pipe of cross-section area 19.625 m² and perimeter 15.7 m. The hydraulic mean diameter is:
 - (1) 4 m

(3) 6 m

- (4) 7 m
- **15.** The precipitation is measured in terms of:
 - (1) Intensity of pressure
 - (2) Depth of water
 - (3) Quantity of water
 - (4) Volume of water

	A rainfall is considered acid rain if the p	H of rainwater is:	
16.		(2) less than 5.6	
	(1) less than 7.0	(4) less than 3.0	
	(3) less than 4.5		
17.	infiltration) rates over specified areas during successive		
	(1) Hydrograph		
	(2) Unit hydrograph		
	(3) Hyetograph		
	(4) None of the above	the state of the state of the state of	
18.	The rainfall of five successive days were measured as 100 mm, 80 mm, 60 mm, 40 m and 20 mm respectively. If the storm loss rate for the catchment area is earliestimated as 50 mm/day, the total surface run off will be:		
	(1) 50 mm	(2) 60 mm	
	(3) 90 mm	(4) 140 mm	
19.	A device used to control the emission size, collection and disposal in dry form	of particulate pollutants smaller than 10-micron at low pressure drop is:	
	(1) Baffle type separator	(2) Fabric filter	
	(3) Louver type separator	(4) Simple gravity settling chambers	
20.	Roughness index of roads is expressed	as:	
	(1) Size of the stone on the pavement		
	(2) Number of patches on the pavemen	nt .	
	(3) Cumulative deformation of surface	per horizontal distance	
	(4) Type of road surface		

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21.	Sludge bulking can be con	trolled b	v :
	Studge bulking can be con	trolled b)

- (1) Chlorination
 - (2) Coagulation
 - (3) Aeration
 - (4) Denitrification

22. Trickle irrigation is also known as:

- (1) Micro irrigation
- (2) Drip irrigation
- (3) Subsurface irrigation
- (4) Sprinkler irrigation

23. The density of ash produced in municipal solid waste is:

- (1) 700 kg/m^2
- (2) 1000 kg/m^3
- $(3) 450 \text{ kg/m}^3$
- (4) 100 kg/m^3

24. Delta (Δ) of a crop means :

- (1) Area under the crop
- (2) Crop period
- (3) Depth of water required by the crop
- (4) Crop production

- In rotary intersection the weaving length is:
 - (1) The length between the ends of the channel in islands in front of two consecutive entry and exit
 - (2) The perimeter of the center line of the road circumfering the central island
 - (3) The distance betwee two opposite roads
 - (4) The width of the road between the central island and the channel island
- For irrigation purposes, the pH value of water should be:
 - (1) Between 3 and 6
 - (2) Between 6 and 8.5
 - (3) Between 8.5 and 11
 - (4) More than 11
- The silt factor in Lacey's theory is given as: 27.

(1)
$$f = 4.75 \sqrt{m}$$
,

(2)
$$f = 7.45 \sqrt{m}$$
,

(3)
$$f = 1.76 \sqrt{m_r}$$

(4)
$$f = 1.56 \sqrt{m}_r$$

- Lining of Irrigation channels: 28.
 - (1) May stop leakage water
 - (2) Creates water logging in near-by areas
 - (3) Both (1) and (2)
 - (4) None of the above

- 29. Canal falls are provided when the available ground slope is:
 - (1) Flatter than the design bed slope of the canal
 - (2) Flatter than the side slope of the canal
 - (3) Steeper than the design bed slope of the canal
 - (4) Steeper than the side slope of the canal
- 30. Standard EDTA solution is used to determinate the:
 - (1) Turbidity in water
 - (2) Dissolved oxygen in water
 - (3) Residual chlorine in water
 - (4) Hardness in water
- 31. Which one of the following is true of a statically determinate beam?
 - (1) One end is fixed, and the other end is simply supported
 - (2) Both the ends are fixed
 - (3) The beam overhangs over two supports
 - (4) The beam is supported on three supports
- 32. Which of the following are examples of indeterminate structures?
 - (i) Fixed beam
 - (ii) Continuous beam
 - (iii) Two-hinged arch
 - (iv) Beam overhanging on both sides

Select the *correct* answer using the codes given below:

- (1) (i), (ii) and (iii) only
- (2) (i), (ii) and (iv) only
- (3) (i), (iii) and (iv) only
- (4) (ii), (iii) and (iv) only

- 33. Which one of the following is correct? A determinate structure:
 - (1) Cannot be analyzed without the correct knowledge of modulus of elasticity.
 - (2) Must necessarily have roller support at one of its ends.
 - (3) Requires only statical equilibrium equations for its analysis.
 - (4) Will have zero deflection at its ends.

34. Match the following:

List - I

List - II

- P. Slope deflection method
- I. Force Method
- Q. Moment distribution method
- II. Displacement Method
- R. Method of three moments
- S. Castigliano's second theorem
- (1) P-I, Q-II, R-I, S-II
- (2) P-I, Q-I, R-II, S-II
- (3) P-II, Q-II, R-I, S-I
- (4) P-II, Q-I, R-II, S-I
- 35. The IRC recommendation for warning sign is expressed by:
 - (1) Circle on top
 - (2) Triangle on top
 - (3) Rectangle on top
 - (4) Square on top

_		
36	. The displacement method is also referred to as w	which one of the following?
	(1) Minimum strain energy method	
	(2) Maxwell-Mohr method	
	(3) Consistent deformation method	
	(4) Slope deflection method	
37.	What is the shape of influence line diagram for respect of a simply supported beam?	or the maximum bending moment in
	(1) Rectangular	
	(2) Triangular	
	(3) Parabolic	
	(4) Circular	
38.	A three hinged parabolic arch of span 'l' and rise 'w', then the horizontal thrust at the support is:	'h' is subjected to a u.d.1. of intensity
	$(1) w1^2/8h$	A contract of the contract of
	(2) wl/h	
	(3) $wl/8h^2$	
	(4) Whl/8	
39.	Centre of mass of a body lies at:	
	(1) outside the system/body	
	(2) inside the system/body	
	(3) at centre	

(4) at anywhere either inside or outside

U		the a spring of negligible mass and
40.	Two blocks of masses 5 kg and 6 kg are placed on a horizontal surface (frictionle heavier block. The velocity of the centre	e connected by a spring of negligible mass and ss). An impulse of 20 m/s velocity is given to a of mass is:
	(1) 9.09 m/s	(2) Maxwell-Mohr method
	(2) 11.09 m/s	(3) Consistent deformation method
	(3) 10.90 m/s	
	(4) 12.90 m/s	(4) Stope deflection method
41.	The earth pressure at rest is calculated by	37, What is the shape of unflience gnisu y
	(1) Euler's theory	(t) Rectangular
	(2) Rankine's theory	(2) Triangular
	(3) Bending theory	(3) Parabolic .
	(4) Theory of elasticity	(4) Circular
42.	and rise of it sministers are a set that	al solid waste, the waste is dumped in the soil
	(2) Land filling	118/2 [M (1)
	(3) Composting	(2) with
	(4) Shredding	(3) wl/8h ²
43.	The coefficient of earth pressure at rest	for stiff clay is about:
	(1) 0.4	(2) 0.5 paid whort is to same to sum to sum?
	(3) 0.6	(4) 0.8 Production of the Production (1)
44.	Aeration of water is done to remove:	(2) inside the system/hody
	(1) Odour	(2) Colour
	(3) Bacteria's	(4) Turbidity

	AF Tour house the formation he tested by adopting :		
45.	. Toughness property of an aggregate car	be tested by adopting:	
	(1) Aggregate crushing strength test		
	(2) Aggregate impact test		
	(3) Los Angeles Abrasion test		
	(4) Angularity number		
46.	by the expulsion of air, is known as:	ity of soil in a fill by reduction of its pore space	;
	(1) Soil exploration	in the state of th	
	(2) Soil stabilization	in the state of the second	
	(3) Soil compaction		
	(4) Consolidation	garana galama a Tabba	
47.	The effect of cohesion on a soil is to:		
	pressure intensities		
(2) increase both active and passive earth pressure intensities			
(3) reduce active earth pressure intensity but to increase passive earth intensity			
	ensity but to reduce passive earth pressure	;	
48.	When was the water (Prevention and Pol	lution) Act enacted by the Indian Parliament:	
	(1) 1970	(2) 1974	
	(3) 1980	(4) 1985	
49.	Terzaghi's bearing capacity factors are fu	nction of	
7	(1) C and φ,	(2) Only φ,	
	(3) φ, and depth of foundation	(4) ϕ , depth and width of foundation	
PHD-H	EE-2023-24/(Civil Engineering)(SET-Y)	/(B) P. T. O).

50. Failure of the stability of slopes generally occurs along: (1) Slip plane (2) A horizontal surface (3) A curved surface (4) All the surfaces 51. In Newtonian fluids, the shear stress is: (1) directly proportional to the viscosity (2) inversely proportional to the viscosity (3) directly proportional to the deformation rate (4) directly proportional to the shear strain 52. Euler number is related to: (1) Inertia force to pressure force (2) Inertia force and elastic force (3) Inertia force and gravity force
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 (2) Inertia force and elastic force (3) Inertia force and viscous force (4) Inertia force and gravity force
 (2) Inertia force and elastic force (3) Inertia force and viscous force (4) Inertia force and gravity force
(3) Inertia force and viscous force (4) Inertia force and gravity force
(4) Inertia force and gravity force
53. If the diameter of the capillary tube is doubled, the capillary rise will be
(1) Doubled
(2) Unaffected Instituted nations of the between the (notified lines actions very) reliew and the manufacture of the between the control of
(4) One-fourth
(3) 198)
54. The unit of dynamic viscosity in MKS system is:
(1) kgf-sec/m ² (2) newton-sec/m ²
(3) m²/sec (4) stroke
and the first bas deep a (4) TID FF-2023-24/(Civil Engineering) (SET) To the

55	The dimensions of surface tension are	59. Wi trade an young to the pli start
	(1) MT^{-2}	
	(2) MT ²	
	$(3) MLT^{-2}$	
	(4) MLT ²	
56.	For a total reaction time of 2.5 sec, km/hr, what is the stopping sight dista	coefficient of friction 0.35, design speed of 80 nce on a highway?
	(1) 124 m	topici esta Drandi sa vicina i isa anga adik
	(2) 132 m	
	(3) 76 m	
	(4) 56 m	en substantin en en entre en
57.		nagement of plastic waste:
	(1) Autoclave	aat idissbayor disabyoyboo etioo ji
	(2) Deep burial	Solve Tribelle, rape at the complete plane (1996)
	(3) Incineration	
	(4) Hydroclave	
58.	Which of the following relations are co	prrect?
	I. Absolute pressure = Atmospheric	pressure + Gauge pressure
 II. Absolute pressure = Atmospheric pressure – Vacuum pressure III. Absolute pressure = Atmospheric pressure + Vacuum pressure 		pressure – Vacuum pressure
		pressure + Vacuum pressure
	IV. Absolute pressure = Atmospheric p	
	(1) I and IV only	(2) I and II only
	(3) II and III only	(4) III and IV only
PHD-E	E-2023-24/(Civil Engineering)(SET-Y	

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15

59. What is the acceptable limit for pH of drinking water?

- (1) 7.5 9.5
- (2) 9.5 10.5
- (3) 5.5 7.5
- (4) 6.5 8.5

60. Stoke's law deals with:

(1) settling of fine particles

Lot. of total tenestron time of 522 are coefficient

- (2) turbulent flow between the parallel plates
- (3) laminar flow between the parallel plates
- (4) laminar flow in the tubes

For single angle discontinuous strut is connected to a gusset plate with one rivet only:

- (1) Effective length = L, permissible strength = 100 percent
- (2) Effective length = L, permissible strength = 80 percent (2) Deep burial
- (3) Effective length = 0.8 L, permissible strength = 100 percent
- (4) None of the above

62. The plastic modulus of rectangular beam of width 200 mm and depth 400 mm is:

Which of the following relation are current?

- (1) 2×10⁶ mm³
- (2) $5.33 \times 10^6 \, \mathrm{mm}^3$
- (3) $8 \times 10^6 \text{ mm}^3$
- (4) $1.07 \times 10^6 \text{ mm}^3$

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63. In cinema theatre, to avoid reverberation, the longitudinal walls should be:

- (1) Perfectly parallel
- (2) Converging towards screen
- (3) Converging towards rear
- (4) Should be curvilinear

64. The foundation are placed below ground level, to increase:

(1) Strength

stra esteron aluminate fearer

(I) 124 m

- (2) Workability which of the following represents hardest grade of biograph ?
- (3) Stability of structure

10 56 to (3) 30 m

(4) All of these

65. Gantt charts indicates:

Ovstacine (1

- (1) Comparison of actual progress with the scheduled progress
- (2) Balance of work to be done
- (3) Progress cost of the project
- (4) Inventory cost

66. In the critical path of construction planning, free float can be:

- (1) Greater than total float
- (2) Equal to total float
- (3) Greater than independent float
- (4) Less than independent float

67.

(1) 50%

(2) 100%

(4) 99.9% as abusing giversome (C)

(3) 75%

68. Heat of hydration in cement is mainly due to:

- (1) di-calcium silicate
- (3) tri-calcium aluminate (2) tri-calcium silicate
- (4) tetra-calcium aluminate ferrite
- 69. Which of the following represents hardest grade of bitumen?
- (1) 30/40

(2) 60/70

(3) 80/100

- (4) 100/120
- 70. The relation between modulus of rupture (f_{cr}) and characteristic compressive strength (fck) is:
- (1) $f_{cr} = 0.7 f_{ck}$

(2) $f_{cr} = 0.7 \sqrt{f_{ck}}$

- (3) $f_{cr} = 0.75 f_{ck}$

- (4) $f_{cr} = 0.7 / \sqrt{f_{ck}}$
- 7. A force of magnitude 5 N moves through a distance of 4 mm in a direction, inclined at 60° to the direction of force. The magnitude of the work done by the force
- (1) $10\sqrt{3}$ N.mm
- (2) 0 N.mm
- (3) 10 N.mm
- (4) 20 N.mm
- PHD-EE-2023-24/(Civil Engineering)(SET-Y)/(B)

W

W

72. The coefficient of friction does not depend on:

- (a) area of interface of two mating surfaces
- (b) roughness of two mating surfaces
- (c) the time of contact

Out of these statements:

- ether (1) (a), (b) and (c) are correct in the house the same as well as the surface to all side of the rectangle is
- (2) (a) and (b) are correct
- (3) (b) and (c) are correct
- (4) (a) and (c) are correct
- 73. The most inconvenient method for parking is:
- (1) 30 degree parking
- (2) 45 degree parking
- (3) Parallel parking
- (4) Zero degree parking
- 74. Temporary hardness in water is due to the presence of:
- (1) Carbonates
- (2) Sulphates
- (3) Chlorides
- (4) Dissolved carbon dioxide

P. T. O.

8

- 75. The factor which influences the design of curves is:
- (1) Permissible centrifugal ratio
- (2) Speed of vehicle
- (3) Maximum permissible super elevation
- (4) All of the above
- 76. A Circular ring of radius 42 cm is cut and bent into the form of a rectangle whose sides are in the ratio of 6:5. The small side of the rectangle is:
- (1) 80 cm
- (2) 30 cm
- (3) 120 cm
- (4) 60 cm
- 77. California Bearing Ratio method for design of flexible pavement takes care of mainly:
- (1) Traffic intensity
- (2) Soil Characteristic
- (3) Property of road material
- (4) Cement grounding
- **78.** Modulus of rigidity is the ration of:
- (1) Linear stress to linear strain
- (2) Lateral strain to linear strain
- (2) I impossible to lateral strain
- (3) Linear stress to lateral strain
- (4) Shear stress to shear strain
- PHD-EE-2023-24/(Civil Engineering)(SET-Y)/(B)

- 79. What are the dimensions of flexural rigidity of a beam element?
- (I) MT

(2) MT^{-2}

(3) ML^3T^2

- (4) MLT⁻²
- 80. If a simply supported beam of span L carries a point load W at the mid span, then downward deflection under the load will be:
- (1) WL³/3El

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the ame of contact

- (2) WL³/8E1
- (3) WL³/48EI

- (4) 5/384 . WL³/3EI
- 81. Direct runoff consists of the about the property of the second secon

Demostic (a) bits (d) (E)

- (1) surface runoff, infiltration and percolation
- (2) overland flow, evapotranspiration and precipitation over stream
- (3) overland flow, prompt interflow and percolation
- (4) surface runoff, prompt interflow and precipitation over stream
- 82. Hydrology deals with:
- (1) process of depletion of water resources of land
- (2) process of natural science of water
- (3) process of various water phases
- (4) all of the above
- 83. Which of the following is a secondary air pollutant?
- (1) Sulphur dioxide
- (2) Ozone
- (3) Carbon monoxide
- (4) Carbon dioxide

84.

W

The hydrograph of short duration can be converted into hydrograph of longer duration

(2) synthetic unit hydrograph

(3) s-curve method

(4) flood routing

Calculate the radius of a rotary curve for a vehicle speed of 40 kmph and coefficient of

(2) 30.5 m

(1) 12.73 m

(3) 22.34 m

friction as 0.45:

85.

(4) 28 mandagers with bushavo (5)

An aquiclude is:

(1) A non-artesian aquifer

norther meetings and prepare

(2) An artesian aquifer

(3) A solid impermeable layer underlying or overlying an aquifer

(4) A large underground water body

87. Prohibitory sign is meant to:

(1) Restrict speed of vehicle

(2) Warn road users of certain hazardous conditions

(3) Prohibit parking of vehicles

(4) Prohibit certain traffic movement

ACCEPTANT STUDY

W

21

88. If the specific capacity of a well is 1.166 litres/sec, then the discharge from this well under a depression head of 3 m head will be:

(1) 1.66 litre/sec

(2) 3.5 litre/sec

(3) 10.5 litre/sec

(4) None of the above

89. The unit of coefficient of transmissibility is:

(1) m^2/s

(2) m/s

(3) unit less

(4) m/s^2

90. The yield of a well can be obtained by:

(1) a pumping test

(2) recuperating test

(3) a chemical test

(4) either (1) or (2)

W

91. The camber value for water bound macadam roads is (2) 2 to 2.5%

(1) 1.7 to 2%

(3) 2.5 to 3%

(4) 3 to 4%

92. The degree of compaction for sand is usually defined in terms of:

(1) Relative density

(2) Standard Proctor test

(3) Modified Proctor test

(4) Nuclear density meter

93. A soil deposit having water content 15%, specific gravity 2.5 and voids ratio 0.5, calculate degree of saturation.

(1) 50%

(3) 75%

(2) 70%

(4) 90%

94.

The self-cleaning velocity for all sewers in India is:

(1) 1.0 m/s to 1.2 m/s

(2) less than 1 m/s

(3) 1.5 m/s to 2.0 m/s

(4) 3.0 m/s to 3.5 m/s

95. The most accurate method of determining the water content in a sample of soil is:

(1) Sand bath method

(2) Calcium carbide method

(3) Oven drying Method

(4) Alcohol method

W

96.

dental caries in children. A fluoride concentration of in water is beneficial for the prevention of

(1) 0.1 to 0.6 p.p.m.

(2) 0.7 to 1.2 p.p.m.

(3) 1.4 to 2.0 p.p.m.

(4) 2.5 to 3.0 p.p.m.

97. The softening point of bitumen can be determined by using:

(1) Viscometer

(2) Ring and ball apparatus

(3) Penetrometer

(4) Briquette mould

Which one of the following statements is correct?

(1) Grain size is the primary criterion for classification of coarse, as well as fine grained soil.

(2) Grain size is the primary criterion for classification of coarse-grained soil

(3) Plasticity curve classifies coarse grained soils

(4) Plasticity characteristics relate to classification of coarse-grained soils

99. For large cities, the suitable method for forecasting population is:

(1) Arithmetical Increase Method

(2) Geometrical Increase Method

(3) Graphical Method

(4) Comparative Method

Chine (1) and the

- 100. In a sieve analysis, 70% of the soil mass is retained on ISS 2.00 mm and 60% is finer than ISS 4.00 than ISS 4.00 mm. Determine effective size of the soil mass of its coefficient of curvature $C_c = 2.00$.
 - (1) 0.50 mm
 - (2) 1.00 mm
 - (3) 1.50 mm
 - (4) 2.00 mm

Total No. of Printed Pages: 25

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SET-Y

Civil Engineering

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Time: 11/4 Hours	Max. Marks : 100	Total Questions : 100
Roll No. (in figures)	(in words)	
Name		
Father's Name		
Date of Examination		
(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 shall be got uploaded on the University Website immediately after the conduct of Entrance Examination. Candidates may raise valid objection/complaint if any, with regard to discrepancy in the question booklet/answer key within 24 hours of uploading the same on the University Website. The complaint be sent by the students to the Controller of Examinations by hand or through email. 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.

1. For single angle discontinuous strut is connected to a gusset plate with one rivet only:

- (1) Effective length = L, permissible strength = 100 percent
- (2) Effective length = L, permissible strength = 80 percent
- (3) Effective length = 0.8 L, permissible strength = 100 percent
- (4) None of the above

2. The plastic modulus of rectangular beam of width 200 mm and depth 400 mm is:

(1) $2 \times 10^6 \text{ mm}^3$

(2) $5.33 \times 10^6 \text{ mm}^3$

(3) $8 \times 10^6 \text{ mm}^3$

(4) $1.07 \times 10^6 \,\mathrm{mm}^3$

3. In cinema theatre, to avoid reverberation, the longitudinal walls should be:

- (1) Perfectly parallel
- (2) Converging towards screen
- (3) Converging towards rear
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- (1) Strength
- (2) Workability
- (3) Stability of structure
- (4) All of these

5. Gantt charts indicates:

- (1) Comparison of actual progress with the scheduled progress
- (2) Balance of work to be done
- (3) Progress cost of the project
- (4) Inventory cost

- 6. In the critical path of construction planning, free float can be:
 - (1) Greater than total float
 - (2) Equal to total float
 - (3) Greater than independent float
 - (4) Less than independent float
- 7. In PERT analysis, the probability of completion of any activity within its expected time is:
 - (1) 50%

(2) 100%

(3) 75%

- (4) 99.9%
- 8. Heat of hydration in cement is mainly due to:
 - (1) di-calcium silicate
 - (2) tri-calcium silicate
 - (3) tri-calcium aluminate
 - (4) tetra-calcium aluminate ferrite
- 9. Which of the following represents hardest grade of bitumen?
 - (1) 30/40

(2) 60/70

(3) 80/100

- (4) 100/120
- **10.** The relation between modulus of rupture (f_{cr}) and characteristic compressive strength (f_{ck}) is:
 - (1) $f_{cr} = 0.7 f_{ck}$
 - (2) $f_{cr} = 0.7 \sqrt{f_{ck}}$
 - (3) $f_{cr} = 0.75 f_{ck}$
 - (4) $f_{cr} = 0.7/\sqrt{f_{ck}}$

	(1) Euler's theory	
	(2) Rankine's theory	
	(3) Bending theory	
	(4) Theory of elasticity	
12.		oal solid waste, the waste is dumped in the soil?
	(1) Incineration	
	(2) Land filling	
	(3) Composting	
	(4) Shredding	
13.	. The coefficient of earth pressure at rest for stiff clay is about :	
	(1) 0.4	(2) 0.5
	(3) 0.6	(4) 0.8
14.	Aeration of water is done to remove :	
	(1) Odour	(2) Colour
	(3) Bacteria's	(4) Turbidity
15.	Toughness property of an aggregate can	be tested by adopting:
	(1) Aggregate crushing strength test	
	(2) Aggregate impact test	
	(3) Los Angeles Abrasion test	
	(4) Angularity number	

11. The earth pressure at rest is calculated by using:

16.	The process of obtaining increased deby the expulsion of air, is known as:	nsity of soil in a fill by reduction of its pore space
	(1) Soil exploration	
	(2) Soil stabilization	
	(3) Soil compaction	
	(4) Consolidation	
17.	The effect of cohesion on a soil is to:	
	(1) reduce both active and passive ear	rth pressure intensities
	(2) increase both active and passive e	arth pressure intensities
	(3) reduce active earth pressure in intensity	tensity but to increase passive earth pressur
	(4) increase active earth pressure intensity	intensity but to reduce passive earth pressur
18.	When was the water (Prevention and I	Pollution) Act enacted by the Indian Parliament:
	(1) 1970	(2) 1974
	(3) 1980	(4) 1985
19.	Terzaghi's bearing capacity factors are	e function of
	(1) C and ϕ ,	(2) Only φ,
	(3) ϕ , and depth of foundation	(4) ϕ , depth and width of foundation
20.	Failure of the stability of slopes gener	ally occurs along:
	(1) Slip plane	
	(2) A horizontal surface	
	(3) A curved surface	
	(4) All the surfaces	

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21. Direct runoff consists of:

	(1) surface runoff, infiltration and percolation	
	(2) overland flow, evapotranspiration and precipitation over stream	
	(3) overland flow, prompt interflow and percolation	
	(4) surface runoff, prompt interflow and precipitation over stream	
22.	Hydrology deals with:	
	(1) process of depletion of water resources of land	
	(2) process of natural science of water	
	(3) process of various water phases	
	(4) all of the above	
23.	Which of the following is a secondary air pollutant?	
	(1) Sulphur dioxide (2) Ozone	
	(3) Carbon monoxide (4) Carbon dioxide	
24.	The hydrograph of short duration can be converted into hydrograph of longer duration by:	
	(1) unit hydrograph	
	(2) synthetic unit hydrograph	
	(3) s-curve method	
	(4) flood routing	

,			C
25.	Calculate the radius of a rotary of friction as 0.45:	curve for a vehicle speed of 40 kmph and coeff	icient of
	(1) 12.73 m	(2) 30.5 m	
	(3) 22.34 m	(4) 28 m	
26.	An aquiclude is:		
	(1) A non-artesian aquifer		
	(2) An artesian aquifer		
	(3) A solid impermeable layer u	inderlying or overlying an aquifer	
	(4) A large underground water b	oody	
27.	Prohibitory sign is meant to:		
	(1) Restrict speed of vehicle		
	(2) Warn road users of certain h	nazardous conditions	
	(3) Prohibit parking of vehicles		
	(4) Prohibit certain traffic move	ement	
28.	If the specific capacity of a we under a depression head of 3 m l	ll is 1.166 litres/sec, then the discharge from the	his well
	(1) 1.66 litre/sec		
	(2) 3.5 litre/sec		
	(3) 10.5 litre/sec		
	(4) None of the above		

29.	The unit of coefficient of transmissibility is:		
	(1) m^2/s	(2) m/s	
	(3) unit less	(4) m/s ²	
30.	The yield of a well can be obtained by:		
	(1) a pumping test		
	(2) recuperating test		
	(3) a chemical test		
	(4) either (1) or (2)		
31.	A rectangular channel section will be mo	ost efficient when :	
	(1) Hydraulic radius is equal to half the depth of flow		
	(2) Hydraulic radius is equal to the depth	h of flow	
	(3) Depth of flow is equal to the bottom width		
	(4) Depth of flow is equal to half the hydraulic radius		
32.	The formula for the head loss in conduit their usual meanings):	s is generally known as (where notations carry	
	(1) Hazen-William's formula		
	(2) Manning's formula		
	(3) Darcy-Weisbach formula		
	(4) Nikuradse formula		

33. The loss of energy at the exit from a pipe is given as:

(1) $h_E = V^2 / g$

(2) $h_F = V^2 / 3g$

(3) $h_E = V^2 / 2g$

(4) $h_F = 2V^2 / g$

34. The water is flowing in a pipe of cross-section area 19.625 m² and perimeter 15.7 m. The hydraulic mean diameter is:

(1) 4 m

(2) 5 m

(3) 6 m

(4) 7 m

35. The precipitation is measured in terms of :

- (1) Intensity of pressure
- (2) Depth of water
- (3) Quantity of water
- (4) Volume of water

36. A rainfall is considered acid rain if the pH of rainwater is:

(1) less than 7.0

(2) less than 5.6

(3) less than 4.5

(4) less than 3.0

37. The graphical representation of average rainfall and rainfall excess (i.e., rainfall minus infiltration) rates over specified areas during successive unit time intervals during a storm is known as:

(1) Hydrograph

(2) Unit hydrograph

(3) Hyetograph

(4) None of the above

38. The rainfall of five successive days were measured as 100 mm, 80 mm, 60 mm, 40 mm and 20 mm respectively. If the storm loss rate for the catchment area is earlier estimated as 50 mm/day, the total surface run off will be:

(1) 50 mm

(2) 60 mm

(3) 90 mm

(4) 140 mm

39.	A device used to control the emission of particulate pollutants smaller than 10-micro size, collection and disposal in dry form at low pressure drop is:	
	(1) Baffle type separator	(2) Fabric filter
	(3) Louver type separator	(4) Simple gravity settling chambers
40.	Roughness index of roads is expressed a	as:
	(1) Size of the stone on the pavement	
	(2) Number of patches on the pavement	
	(3) Cumulative deformation of surface p	per horizontal distance
	(4) Type of road surface	
41.	1. A force of magnitude 5 N moves through a distance of 4 mm in a direction, inclin at 60° to the direction of force. The magnitude of the work done by the force is	
	(1) $10\sqrt{3} \text{ N.mm}$	(2) 0 N.mm
	(3) 10 N.mm	(4) 20 N.mm
42.	The coefficient of friction does <i>not</i> deper	nd on :
	(a) area of interface of two mating surfa	ces
	(b) roughness of two mating surfaces	
	(c) the time of contact	
	Out of these statements:	
	(1) (a), (b) and (c) are correct	
	(2) (a) and (b) are correct	
	(3) (b) and (c) are correct	
	(4) (a) and (c) are correct	

43.	The most inconvenient method for parking is:
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	(3) 120 cm
	(4) 60 cm

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	(1) MT	(2) MT^{-2}
	(3) ML^3T^{-2}	(4) MLT^{-2}
50.	If a simply supported beam of span downward deflection under the load w	L carries a point load W at the mid span, then vill be:
	(1) WL ³ /3El	(2) $WL^3/8El$
	(3) $WL^3/48El$	(4) $5/384 \cdot WL^3/3El$
51.	The camber value for water bound ma	cadam roads is:
	(1) 1.7 to 2%	(2) 2 to 2.5%
	(3) 2.5 to 3%	(4) 3 to 4%

52.	The degree of compaction for sand is	susually defined in terms of :	
	(1) Relative density		
	(2) Standard Proctor test		
	(3) Modified Proctor test		
	(4) Nuclear density meter		
53.	A soil deposit having water content calculate degree of saturation.	at 15%, specific gravity 2.5 and voids ratio) 0
	(1) 50%	(2) 70%	
	(3) 75%	(4) 90%	
54.	The self-cleaning velocity for all sew	ers in India is :	
	(1) 1.0 m/s to 1.2 m/s		
	(2) less than 1 m/s		
	(3) 1.5 m/s to 2.0 m/s		
	(4) 3.0 m/s to 3.5 m/s		
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	(2) Calcium carbide method		
	(3) Oven drying Method		
	(4) Alcohol method		

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56.	A fluoride concentration of in water is beneficial for the prevention of dental caries in children.
	(1) 0.1 to 0.6 p.p.m.
	(2) 0.7 to 1.2 p.p.m.
	(3) 1.4 to 2.0 p.p.m.

- (4) 2.5 to 3.0 p.p.m.
- **57.** The softening point of bitumen can be determined by using:
 - (1) Viscometer
 - (2) Ring and ball apparatus
 - (3) Penetrometer
 - (4) Briquette mould
- **58.** Which one of the following statements is *correct*?
 - (1) Grain size is the primary criterion for classification of coarse, as well as fine grained soil.
 - (2) Grain size is the primary criterion for classification of coarse-grained soil.
 - (3) Plasticity curve classifies coarse grained soils.
 - (4) Plasticity characteristics relate to classification of coarse-grained soils.
- 59. For large cities, the suitable method for forecasting population is:
 - (1) Arithmetical Increase Method
 - (2) Geometrical Increase Method
 - (3) Graphical Method
 - (4) Comparative Method

ł		is finer
60.	In a sieve analysis, 70% of the soil mass than ISS 4.00 mm. Determine effective curvature $C_c = 2.00$.	is is retained on ISS 2.00 mm and 60% is finer we size of the soil mass of its coefficient of
	(1) 0.50 mm	(2) 1.00 mm
	(3) 1.50 mm	(4) 2.00 mm
61.	Which one of the following is <i>true</i> of a	statically determinate beam ?
	(1) One end is fixed, and the other end	is simply supported
	(2) Both the ends are fixed	
	(3) The beam overhangs over two supp	orts
	(4) The beam is supported on three sup	ports
62.	Which of the following are examples of	indeterminate structures ?
	(i) Fixed beam	
	(ii) Continuous beam	
	(iii) Two-hinged arch	
	(iv) Beam overhanging on both sides	
	Select the <i>correct</i> answer using the code	es given below:
	(1) (i), (ii) and (iii) only	
	(2) (i), (ii) and (iv) only	
	(3) (i), (iii) and (iv) only	
	(4) (ii), (iii) and (iv) only	

- **63.** Which one of the following is *correct*? A determinate structure :
 - (1) Cannot be analyzed without the correct knowledge of modulus of elasticity.
 - (2) Must necessarily have roller support at one of its ends.
 - (3) Requires only statical equilibrium equations for its analysis.
 - (4) Will have zero deflection at its ends.

64. Match the following:

List - I

List - II

- P. Slope deflection method
- I. Force Method
- Q. Moment distribution method
- II. Displacement Method
- R. Method of three moments
- S. Castigliano's second theorem
- (1) P-I, Q-II, R-I, S-II
- (2) P-I, Q-I, R-II, S-II
- (3) P-II, Q-II, R-I, S-I
- (4) P-II, Q-I, R-II, S-I
- 65. The IRC recommendation for warning sign is expressed by:
 - (1) Circle on top
 - (2) Triangle on top
 - (3) Rectangle on top
 - (4) Square on top

	•
16	tich one of the following?
66.	The displacement method is also referred to as which one of the following?
	(1) Minimum strain energy method
	(2) Maxwell-Mohr method
	(3) Consistent deformation method
	(4) Slope deflection method
67.	What is the shape of influence line diagram for the maximum bending moment in respect of a simply supported beam?
	(1) Rectangular
	(2) Triangular
	(3) Parabolic
	(4) Circular
68.	A three hinged parabolic arch of span 'l' and rise 'h' is subjected to a u.d.l. of intensit 'w', then the horizontal thrust at the support is:
	$(1) w1^2/8h$
	(2) wl/h
	(3) $wl/8h^2$
	(4) Whl/8
69.	Centre of mass of a body lies at:
	(1) outside the system/body
	(2) inside the system/body
	(3) at centre
	(4) at anywhere either inside or outside

70.	Two blocks of masses 5 kg and 6 kg are connected by a spring of negligible mass and placed on a horizontal surface (frictionless). An impulse of 20 m/s velocity is given to a heavier block. The velocity of the centre of mass is:			
	(1) 9.09 m/s	(2) 11.09 m/s		
	(3) 10.90 m/s	(4) 12.90 m/s		
71.	The property of soil due to which water	percolates through, it is known as:		
	(1) Liquidity	(2) Capillarity		
	(3) Permeability	(4) None of the above		
72.	Hygroscopic water is defined:			
	(1) The water held by the soil under cap	pillary action		
	(2) The readily available water for the u	used of plants		
	(3) The water which is absorbed by the	particles of dry soil from the atmosphere		
	(4) Total water content of the soil filled	with water		
	T	,		

- **73.** Traffic density is defined as:
 - (1) The number of vehicles per unit length
 - (2) The number of vehicle moving in a specific direction per lane per day
 - (3) The number of vehicle passing a given point in on hour
 - (4) The number of vehicles moving in a specific direction per hour
- 74. Seepage velocity of water in soil is equal to the:
 - (1) discharge velocity divided by porosity
 - (2) discharge velocity multiplied by porosity
 - (3) discharge velocity divided by permeability
 - (4) discharge velocity multiplied by permeability

(3) 2

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		(
75.	For a standard compaction test, the m follows:	ass of hammer and the drop of hammer are a_{33}
	(1) 2.60 kg. and 450 mm	
	(2) 2.60 kg. and 310 mm	
	(3) 4.89 kg. and 310 mm	
	(4) 4.89 kg. and 450 mm	
76.	A phreatic line is defined as the line wit	hin a dam section below which there are:
	(1) Positive equipotential lines	
	(2) Positive hydrostatic pressure	
	(3) Negative hydrostatic pressure	
	(4) Negative equipotential lines	
77.	When the Adiabatic Lapse Rate (ALR) then the ELR can be called as:	is more than Environment Lapse Rates (ELR.
	(1) Super adiabatic lapse rate	
	(2) Sub adiabatic lapse rate	
	(3) Dry adiabatic lapse rate	
	(4) Wet adiabatic rate	
78.	IRC recommendation for maximum wid	th of a walk a se
	(1) 1.75 m	
	(3) 2.44 m	(2) 2.00 m
		(4) 4.88 m
79.	A clay layer of thickness 10 cm and inition the final void ratio is 0.2. The settlement	tial void ratio 0.5 undergoes settlement so that
	(1) 1	(2) 1.5
		(-) 1.J

(4) 2.5

80.	The shear	ar strength	of a	soil	•
-----	-----------	-------------	------	------	---

- (1) is directly proportional to the angle of internal friction of the soil
- (2) is inversely proportional to the angle of internal friction of soil
- (3) decreases with increase in normal stress
- (4) decreases with decrease in normal stress

81. Sludge bulking can be controlled by:

- (1) Chlorination
- (2) Coagulation
- (3) Aeration
- (4) Denitrification

82. Trickle irrigation is also known as:

- (1) Micro irrigation
- (2) Drip irrigation
- (3) Subsurface irrigation
- (4) Sprinkler irrigation

83. The density of ash produced in municipal solid waste is:

- (1) 700 kg/m^2
- $(2) 1000 \text{ kg/m}^3$
- (3) 450 kg/m^3
- $(4) 100 \text{ kg/m}^3$

84.	Delta	(Δ)	of	a	crop	means	
-----	-------	------------	----	---	------	-------	--

- (1) Area under the crop
- (2) Crop period
- (3) Depth of water required by the crop
- (4) Crop production

85. In rotary intersection the weaving length is:

- (1) The length between the ends of the channel in islands in front of two consecutive entry and exit
- (2) The perimeter of the center line of the road circumfering the central island
- (3) The distance betwee two opposite roads
- (4) The width of the road between the central island and the channel island

86. For irrigation purposes, the pH value of water should be:

- (1) Between 3 and 6
- (2) Between 6 and 8.5
- (3) Between 8.5 and 11
- (4) More than 11

87. The silt factor in Lacey's theory is given as:

(1)
$$f = 4.75 \sqrt{m_r}$$

(2)
$$f = 7.45 \sqrt{m}_r$$

(3)
$$f = 1.76 \sqrt{m_r}$$

(4)
$$f = 1.56 \sqrt{m_r}$$

- **88.** Lining of Irrigation channels:
 - (1) May stop leakage water
 - (2) Creates water logging in near-by areas
 - (3) Both (1) and (2)
 - (4) None of the above
- 89. Canal falls are provided when the available ground slope is:
 - (1) Flatter than the design bed slope of the canal
 - (2) Flatter than the side slope of the canal
 - (3) Steeper than the design bed slope of the canal
 - (4) Steeper than the side slope of the canal
- 90. Standard EDTA solution is used to determinate the:
 - (1) Turbidity in water
 - (2) Dissolved oxygen in water
 - (3) Residual chlorine in water
 - (4) Hardness in water
- 91. In Newtonian fluids, the shear stress is:
 - (1) directly proportional to the viscosity
 - (2) inversely proportional to the viscosity
 - (3) directly proportional to the deformation rate
 - (4) directly proportional to the shear strain

92	Euler number is related to :
	(1) Inertia force to pressure force
	(2) Inertia force and elastic force
	(3) Inertia force and viscous force
	(4) Inertia force and gravity force
93.	If the diameter of the capillary tube is doubled, the capillary rise will be:
	(1) Doubled
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	(3) Halved
	(4) One-fourth
94.	The unit of dynamic viscosity in MKS system is:
	(1) kgf-sec/m ²
	(2) newton-sec/m ²
	(3) m ² /sec
	(4) stroke
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	(1) MT^{-2}
	$(2) MT^2$
	(3) MLT^{-2}
	(4) MLT ²

96.	For a total reaction time of 2.5 sec, coefficient of friction 0.35, design speed of 80 km/hr, what is the stopping sight distance on a highway?
	(1) 124 m
	(2) 132 m
	(3) 76 m
	(4) 56 m
97.	Following is <i>not</i> recommended for management of plastic waste:
	(1) Autoclave
	(2) Deep burial
	(3) Incineration
	(4) Hydroclave
98.	Which of the following relations are <i>correct</i> ?
	I. Absolute pressure = Atmospheric pressure + Gauge pressure
	II. Absolute pressure = Atmospheric pressure – Vacuum pressure
	III. Absolute pressure = Atmospheric pressure + Vacuum pressure
	IV. Absolute pressure = Atmospheric pressure - Gauge pressure
	(1) I and IV only
	(2) I and II only
	(3) II and III only
	(4) III and IV only

- 99. What is the acceptable limit for pH of drinking water?
 - (1) 7.5 9.5
 - (2) 9.5 10.5
 - (3) 5.5 7.5
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 - (1) settling of fine particles
 - (2) turbulent flow between the parallel plates
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Civil Engineering

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Father's Name	Mother's Name	
Date of Examination		
(Signature of the Candidate)		(Signature of the Invigilator)

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SEVI

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	(1) Chlorination
	(2) Coagulation
	(3) Aeration
	(4) Denitrification
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	(1) Micro irrigation
	(2) Drip irrigation
	(3) Subsurface irrigation
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	(1) Flatter than the design bed slope	of the canal		
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	(1) Turbidity in water			
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	(3) Residual chlorine in water			
	(4) Hardness in water			
11.	The camber value for water bound macadam roads is:			
	(1) 1.7 to 2%	(2) 2 to 2.5%		
	(3) 2.5 to 3%	(4) 3 to 4%		
12.	The degree of compaction for sand is	usually defined in terms of :		
	(1) Relative density			
	(2) Standard Proctor test			
	(3) Modified Proctor test			

(4) Nuclear density meter

13.	A soil deposit having water contercalculate degree of saturation.	t 15%, specific gravity 2.5 and voids ratio 0.5
	(1) 50%	(2) 70%
	(3) 75%	(4) 90%
14.	The self-cleaning velocity for all sew	ers in India is :
	(1) 1.0 m/s to 1.2 m/s	
	(2) less than 1 m/s	
	(3) 1.5 m/s to 2.0 m/s	
	(4) 3.0 m/s to 3.5 m/s	
15.	The most accurate method of determi	ing the water content in a sample of soil is:
	(1) Sand bath method	
	(2) Calcium carbide method	
	(3) Oven drying Method	
	(4) Alcohol method	
16.	A fluoride concentration of dental caries in children.	in water is beneficial for the prevention o
	(1) 0.1 to 0.6 p.p.m.	
	(2) 0.7 to 1.2 p.p.m.	
	(3) 1.4 to 2.0 p.p.m.	
	(4) 2.5 to 3.0 p.p.m.	

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	(1) 0.50 mm	(2) 1.00 mm	
	(3) 1.50 mm	(4) 2.00 mm	
21.	A rectangular channel section will be most efficient when:		
	(1) Hydraulic radius is equal to half the depth of flow		
	(2) Hydraulic radius is equal to the dep		
	(3) Depth of flow is equal to the bottom	n width	

(4) Depth of flow is equal to half the hydraulic radius

- 22. The formula for the head loss in conduits is generally known as (where notations carry their usual meanings):(1) Hazen-William's formula(2) Manning's formula
 - (3) Darcy-Weisbach formula
 - (4) Nikuradse formula
- 23. The loss of energy at the exit from a pipe is given as:

$$(1) h_E = V^2 / g$$

(2)
$$h_E = V^2 / 3g$$

(3)
$$h_E = V^2 / 2g$$

(4)
$$h_E = 2V^2 / g$$

- **24.** The water is flowing in a pipe of cross-section area 19.625 m² and perimeter 15.7 m. The hydraulic mean diameter is:
 - (1) 4 m

(2) 5 m

(3) 6 m

- (4) 7 m
- **25.** The precipitation is measured in terms of :
 - (1) Intensity of pressure

(2) Depth of water

(3) Quantity of water

- (4) Volume of water
- 26. A rainfall is considered acid rain if the pH of rainwater is:
 - (1) less than 7.0

(2) less than 5.6

(3) less than 4.5

- (4) less than 3.0
- 27. The graphical representation of average rainfall and rainfall excess (i.e, rainfall minus infiltration) rates over specified areas during successive unit time intervals during a storm is known as:
 - (1) Hydrograph

(2) Unit hydrograph

(3) Hyetograph

(4) None of the above

28. The rainfall of five successive days were measured as 100 mm, 80 mm, 60 mm, 40 mm and 20 mm respectively. If the storm loss rate for the catchment area is earlier estimated as 50 mm/day, the total surface run off will be:

(1) 50 mm

(2) 60 mm

(3) 90 mm

(4) 140 mm

29. A device used to control the emission of particulate pollutants smaller than 10-micron size, collection and disposal in dry form at low pressure drop is:

(1) Baffle type separator

(2) Fabric filter

(3) Louver type separator

(4) Simple gravity settling chambers

30. Roughness index of roads is expressed as :

(1) Size of the stone on the pavement

(2) Number of patches on the pavement

(3) Cumulative deformation of surface per horizontal distance

(4) Type of road surface

31. For single angle discontinuous strut is connected to a gusset plate with one rivet only:

(1) Effective length = L, permissible strength = 100 percent

(2) Effective length = L, permissible strength = 80 percent

(3) Effective length = 0.8 L, permissible strength = 100 percent

(4) None of the above

32. The plastic modulus of rectangular beam of width 200 mm and depth 400 mm is :

(1) $2 \times 10^6 \text{ mm}^3$

(2) $5.33 \times 10^6 \,\mathrm{mm}^3$

(3) $8 \times 10^6 \text{ mm}^3$

(4) $1.07 \times 10^6 \,\mathrm{mm}^3$

In cinema theatre, to avoid reverberation, the longitudinal walls should be:
In cinema ineaire, to avoid reverberation, the roag-
(1) Perfectly parallel
(2) Converging towards screen
(3) Converging towards rear
(4) Should be curvilinear
The foundation are placed below ground level, to increase:
(1) Strength
(2) Workability
(3) Stability of structure
(4) All of these
Gantt charts indicates:
(1) Comparison of actual progress with the scheduled progress
(2) Balance of work to be done
(3) Progress cost of the project
(4) Inventory cost
In the critical path of construction planning, free float can be:
(1) Greater than total float
(2) Equal to total float
(3) Greater than independent float
(4) Less than independent float
In PERT analysis, the probability of completion of any activity within its expected time
is :
(1) 50% (2) 100%
(3) 75% (4) 99.9% E. 2023, 24/(Civil Engineering)(SET-Y)/(D)

38. Heat of hydration in cement is mainly due to :

- (1) di-calcium silicate
- (2) tri-calcium silicate
- (3) tri-calcium aluminate
- (4) tetra-calcium aluminate ferrite

39. Which of the following represents hardest grade of bitumen?

(1) 30/40

(2) 60/70

(3) 80/100

(4) 100/120

40. The relation between modulus of rupture (f_{cr}) and characteristic compressive strength (f_{ck}) is :

(1) $f_{cr} = 0.7 f_{ck}$

(2) $f_{cr} = 0.7 \sqrt{f_{ck}}$

(3) $f_{cr} = 0.75 f_{ck}$

(4) $f_{cr} = 0.7/\sqrt{f_{ck}}$

41. In Newtonian fluids, the shear stress is:

- (1) directly proportional to the viscosity
- (2) inversely proportional to the viscosity
- (3) directly proportional to the deformation rate
- (4) directly proportional to the shear strain

42. Euler number is related to:

- (1) Inertia force to pressure force
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	(1) MT^{-2}
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	(1) 124 m
	(2) 132 m
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- **47.** Following is *not* recommended for management of plastic waste
 - (1) Autoclave
 - (2) Deep burial
 - (3) Incineration
 - (4) Hydroclave
- **48.** Which of the following relations are *correct*?
 - I. Absolute pressure = Atmospheric pressure + Gauge pressure
 - II. Absolute pressure = Atmospheric pressure Vacuum pressure
 - III. Absolute pressure = Atmospheric pressure + Vacuum pressure
 - IV. Absolute pressure = Atmospheric pressure Gauge pressure
 - (1) I and IV only
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- **49.** What is the acceptable limit for pH of drinking water?
 - (1) 7.5 9.5
 - (2) 9.5 10.5
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- 50. Stoke's law deals with:
 - (1) settling of fine particles
 - (2) turbulent flow between the parallel plates
 - (3) laminar flow between the parallel plates
 - (4) laminar flow in the tubes

51. Direct runoff consists of:

	(1) surface runoff, infiltration and perco	lation		
	(2) overland flow, evapotranspiration and precipitation over stream			
	(3) overland flow, prompt interflow and percolation			
	(4) surface runoff, prompt interflow and	I precipitation over stream		
52.	Hydrology deals with :			
	(1) process of depletion of water resources of land			
	(2) process of natural science of water			
	(3) process of various water phases			
	(4) all of the above			
53.	Which of the following is a secondary as	ir pollutant !		
	(1) Sulphur dioxide	(2) Ozone		
	(3) Carbon monoxide	(4) Carbon dioxide		
54.	. The hydrograph of short duration can be converted into hydrograph of longer duration by:			
	(1) unit hydrograph			
	(2) synthetic unit hydrograph			
	(3) s-curve method			
	(4) flood routing			
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55.	Calculate the radius of a rotary curve for a vehicle speed of 40 kmph and coefficient friction as 0.45:		
	(1) 12.73 m	(2) 30.5 m	
	(3) 22.34 m	(4) 28 m	
56.	An aquiclude is:		
	(1) A non-artesian aquifer		
	(2) An artesian aquifer		
	(3) A solid impermeable layer underlying or overlying an aquifer		
	(4) A large underground water body		
57.	Prohibitory sign is meant to:		
	(1) Restrict speed of vehicle		
	(2) Warn road users of certain hazardou	s conditions	
	(3) Prohibit parking of vehicles		
	(4) Prohibit certain traffic movement		
58.	If the specific capacity of a well is 1.166 litres/sec, then the discharge from this w under a depression head of 3 m head will be:		
	(1) 1.66 litre/sec		
	(2) 3.5 litre/sec		
	(3) 10.5 litre/sec		
	(4) None of the above		

59.	The unit of coefficient of transmissionity is		
	(1) m2/s		
	(2) m/s		
	(3) unit less		
	$(4) m/s^2$		
60.	The yield of a well can be obtained by:		
	(1) a pumping test		
	(2) recuperating test		
	(3) a chemical test		
	(4) either (1) or (2)		
61.	The property of soil due to which water	percolates through, it is known as:	
	(1) Liquidity	(2) Capillarity	
	(3) Permeability	(4) None of the above	
62.	Hygroscopic water is defined:		
	(1) The water held by the soil under cap	pillary action	
	(2) The readily available water for the	used of plants	
	(3) The water which is absorbed by the	particles of dry soil from the atmosphere	
	(4) Total water content of the soil filled	I with water	

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- **63.** Traffic density is defined as:
 - (1) The number of vehicles per unit length
 - (2) The number of vehicle moving in a specific direction per lane per day
 - (3) The number of vehicle passing a given point in on hour
 - (4) The number of vehicles moving in a specific direction per hour
- 64. Seepage velocity of water in soil is equal to the:
 - (1) discharge velocity divided by porosity
 - (2) discharge velocity multiplied by porosity
 - (3) discharge velocity divided by permeability
 - (4) discharge velocity multiplied by permeability
- **65.** For a standard compaction test, the mass of hammer and the drop of hammer are as follows:
 - (1) 2.60 kg. and 450 mm
 - (2) 2.60 kg. and 310 mm
 - (3) 4.89 kg. and 310 mm
 - (4) 4.89 kg. and 450 mm
- 66. A phreatic line is defined as the line within a dam section below which there are:
 - (1) Positive equipotential lines
 - (2) Positive hydrostatic pressure
 - (3) Negative hydrostatic pressure
 - (4) Negative equipotential lines

67.	. When the Adiabatic Lapso then the ELR can be called	e Rate (ALR) is more than Environment Lapse Rates (ELR). d as:	
	(1) Super adiabatic lapse	rate	
	(2) Sub adiabatic lapse ra	te	
	(3) Dry adiabatic lapse rate	te	
	(4) Wet adiabatic rate		
68.	. IRC recommendation for r	maximum width of a vehicle is:	
	(1) 1.75 m	(2) 2.00 m	
	(3) 2.44 m	(4) 4.88 m	
69.		10 cm and initial void ratio 0.5 undergoes settlement so that The settlement of the layer in cm is:	
	(1) 1	(2) 1.5	
	(3) 2	(4) 2.5	
70.	The shear strength of a soil	:	
	(1) is directly proportional to the angle of internal friction of the soil		
	(2) is inversely proportional to the angle of internal friction of soil		
	(3) decreases with increase in normal stress		
	(4) decreases with decrease in normal stress		
71.	The earth pressure at rest is	calculated by using:	
~ #	(1) Euler's theory		
	(2) Rankine's theory		
	(3) Bending theory		
	(4) Theory of elasticity		
	theory of clasticity		

72.	In which method of disposal o	f municipal solid waste, the waste is dumped in the soil :
	(1) Incineration	
	(2) Land filling	
	(3) Composting	
	(4) Shredding	
73.	The coefficient of earth pressu	ire at rest for stiff clay is about:
	(1) 0.4	(2) 0.5
	(3) 0.6	(4) 0.8
74.	Aeration of water is done to re	emove :
	(1) Odour	(2) Colour
	(3) Bacteria's	(4) Turbidity
75.	Toughness property of an aggre	regate can be tested by adopting:
	(1) Aggregate crushing streng	gth test
	(2) Aggregate impact test	
	(3) Los Angeles Abrasion test	į.
	(4) Angularity number	
76. The process of obtaining increased density of soil in a fill by reduction of its poby the expulsion of air, is known as:		
	(1) Soil exploration	
	(2) Soil stabilization	
	(3) Soil compaction	
	(4) Consolidation	

77.	The effect of cohesion on a soil is	s to :	
	(1) reduce both active and passiv	re earth pressure intensities	
	(2) increase both active and pass	ive earth pressure intensities	
	(3) reduce active earth pressure intensity but to increase passive earth pressur intensity		
	(4) increase active earth pressuintensity	are intensity but to reduce passive earth pressure	
78.	When was the water (Prevention a	and Pollution) Act enacted by the Indian Parliament:	
	(1) 1970	(2) 1974	
	(3) 1980	(4) 1985	
79.	Terzaghi's bearing capacity factor	rs are function of	
	(1) C and ϕ ,	(2) Only φ,	
	(3) ϕ , and depth of foundation	(4) ϕ , depth and width of foundation	
80.	Failure of the stability of slopes g	enerally occurs along:	
	(1) Slip plane		
	(2) A horizontal surface		
	(3) A curved surface		
	(4) All the surfaces		

- 81. Which one of the following is true of a statically determinate beam?
 - (1) One end is fixed, and the other end is simply supported
 - (2) Both the ends are fixed
 - (3) The beam overhangs over two supports
 - (4) The beam is supported on three supports

82.	Which of the following	are	examples of indeterminate structures?	,
-----	------------------------	-----	---------------------------------------	---

- (i) Fixed beam
- (ii) Continuous beam
- (iii) Two-hinged arch
- (iv) Beam overhanging on both sides

Select the *correct* answer using the codes given below:

- (1) (i), (ii) and (iii) only
- (2) (i), (ii) and (iv) only
- (3) (i), (iii) and (iv) only
- (4) (ii), (iii) and (iv) only

83. Which one of the following is *correct*? A determinate structure:

- (1) Cannot be analyzed without the correct knowledge of modulus of elasticity.
- (2) Must necessarily have roller support at one of its ends.
- (3) Requires only statical equilibrium equations for its analysis.
- (4) Will have zero deflection at its ends.

84. Match the following:

List - I

List - II

- P. Slope deflection method
- I. Force Method
- Q. Moment distribution method
- II. Displacement Method
- R. Method of three moments
- S. Castigliano's second theorem
- (1) P-I, Q-II, R-I, S-II
- (2) P-I, Q-I, R-II, S-II
- (3) P-II, Q-II, R-I, S-I

(4)	P-II	Ω -I	R-II,	S-I
(,	1 -11,	Q-1,	17-11,	72-T

- **85.** The IRC recommendation for warning sign is expressed by :
 - (1) Circle on top
 - (2) Triangle on top
 - (3) Rectangle on top
 - (4) Square on top
- 86. The displacement method is also referred to as which one of the following?
 - (1) Minimum strain energy method
 - (2) Maxwell-Mohr method
 - (3) Consistent deformation method
 - (4) Slope deflection method
- 87. What is the shape of influence line diagram for the maximum bending moment in respect of a simply supported beam?
 - (1) Rectangular
 - (2) Triangular
 - (3) Parabolic
 - (4) Circular
- 88. A three hinged parabolic arch of span 'I' and rise 'h' is subjected to a u.d.1. of intensity 'w', then the horizontal thrust at the support is:
 - $(1) w1^2/8h$
 - (2) wl/h
 - (3) $wl/8h^2$
 - (4) Whl/8

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89.	Centre of mass of a body lies at:	
	(1) outside the system/body	
	(2) inside the system/body	
	(3) at centre	
	(4) at anywhere either inside or outside	
90.	Two blocks of masses 5 kg and 6 kg are connected by a spring of negligible mass and placed on a horizontal surface (frictionless). An impulse of 20 m/s velocity is given to a heavier block. The velocity of the centre of mass is:	
	(1) 9.09 m/s	
	(2) 11.09 m/s	
	(3) 10.90 m/s	
	(4) 12.90 m/s	
	A force of magnitude 5 N moves through a distance of 4 mm in a direction, inclined at 60° to the direction of force. The magnitude of the work done by the force	
	$(10\sqrt{3} \text{ N.mm})$	
	27 D N mm	
	³ Num	

92.	The coefficient of friction does not depend on :
	(a) area of interface of two mating surfaces
	(b) roughness of two mating surfaces
	(c) the time of contact
	Out of these statements :
	(1) (a), (b) and (c) are correct
	(2) (a) and (b) are correct
	(3) (b) and (c) are correct
	(4) (a) and (c) are correct
93.	The most inconvenient method for parking is:
	(1) 30 degree parking
	(2) 45 degree parking
	(3) Parallel parking
	(4) Zero degree parking
94.	Temporary hardness in water is due to the presence of:
	(1) Carbonates
	(2) Sulphates
	(3) Chlorides
	(4) Dissolved carbon dioxide
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	95. The factor which influences the design of curves is:	
	(1) Permissible centrifugal ratio	
	(2) Speed of vehicle	
	(3) Maximum permissible super elevation	
	(4) All of the above	
9	6. A Circular ring of radius 42 cm is cut and bent into the form of a rectangle whose si are in the ratio of 6:5. The small side of the rectangle is:	des
	(1) 80 cm	
	(2) 30 cm	
	(3) 120 cm	
	(4) 60 cm	
97.	. California Bearing Ratio method for design of flexible pavement takes care of main	y:
	(1) Traffic intensity	
	(2) Soil Characteristic	
	(3) Property of road material	
	(4) Cement grounding	
98.	Modulus of rigidity is the ration of:	
	(1) Linear stress to linear strain	
	(2) Lateral strain to linear strain	
	(3) Linear stress to lateral strain	
	(4) Shear stress to shear strain	

- 99. What are the dimensions of flexural rigidity of a beam element?
 - (1) MT

(2) MT⁻²

(3) ML^3T^{-2}

- (4) MLT⁻²
- 100. If a simply supported beam of span L carries a point load W at the mid span, then downward deflection under the load will be:
 - (1) $WL^3/3E1$

(2) $WL^3/8E1$

(3) $WL^3/48El$

(4) 5/384 . WL³/3El

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46	2	4	4	1
47	2	3	3	3
48	3	2	4	2
49	3	2	3	4
50	4	3	3	1

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Answ	er keys of PHD-EE-2023	-24 (CIVIL ENGG.) enti	rance exam dated 22.0	3.2024
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100	4	1	1	3

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