

University of Mumbai
Examination 2020 under cluster KJSIEIT

Examinations Commencing from 7th January 2021 to 20th January 2021

Program: **Civil Engineering**

Curriculum Scheme: 2016

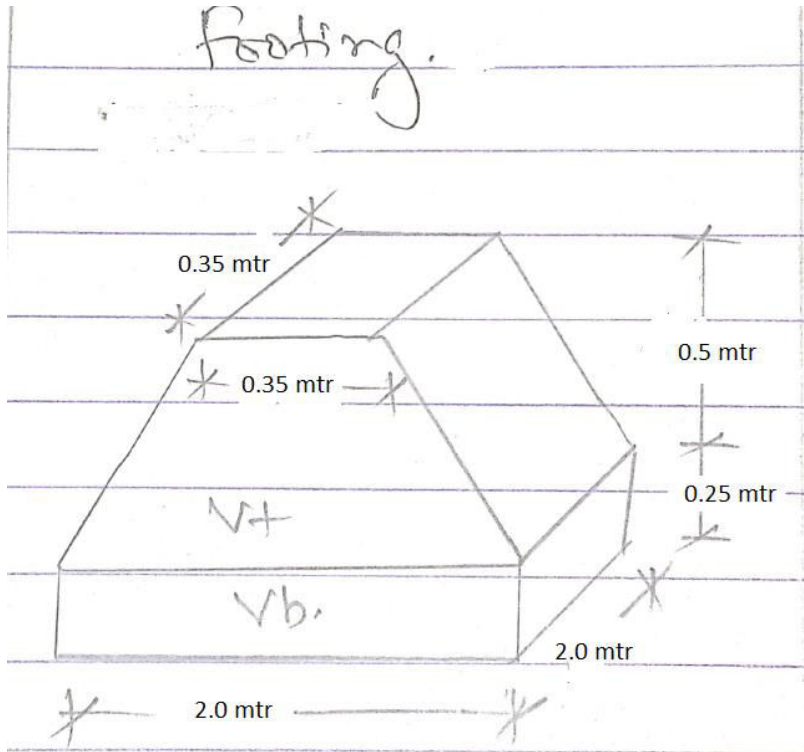
Examination: BE Semester VII

Course Code: **CE-C701** and Course Name: **Quantity Survey Estimation and Valuation**

Time: 2 hour

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	As per IS 1200 the quantity for measurement of walls one brick thick and less shall be measured in
Option A:	square metre
Option B:	cubic metre
Option C:	running metre
Option D:	number of bricks
2.	What is the present market rate of one cubic metre of coarse aggregates in Rupees is
Option A:	500/-
Option B:	1800/-
Option C:	3000/-
Option D:	1000/-
3.	What is the present State Schedule Rate 2020-2021 of Mason I Class Skilled in Rupees per day
Option A:	840/-
Option B:	622/-
Option C:	592/-
Option D:	560/-
4.	For the item of work "2nd Class Brick Masonry in superstructure in cement mortar 1:3", the quantity of sand required in dry volume after adding up for frog filling, brick bonding courses and wastage for 10cubic metre work will be
Option A:	4.37 cubic metre
Option B:	1.87 cubic metre
Option C:	2.67 cubic metre
Option D:	3.55 cubic metre
5.	Specifications of items of work should be expressed so that the statement should be _____
Option A:	obscure
Option B:	concrete and specific
Option C:	ambiguous
Option D:	vague and abstract

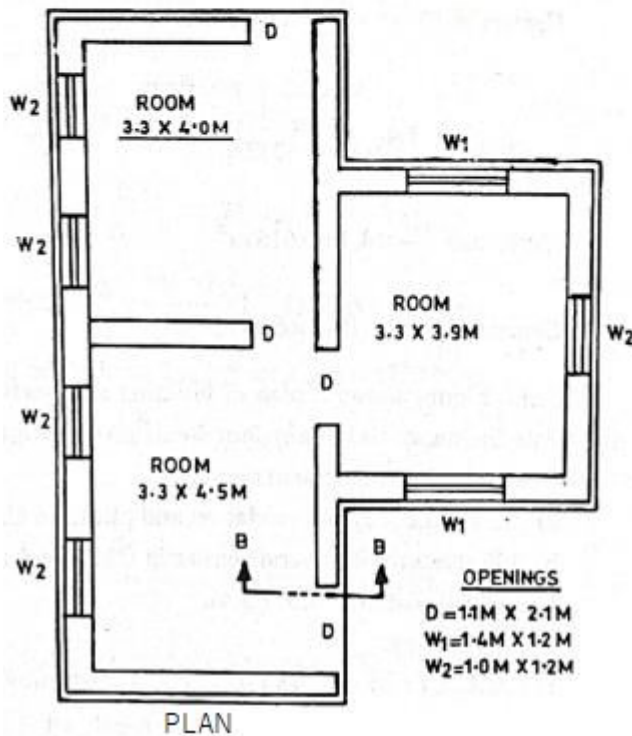
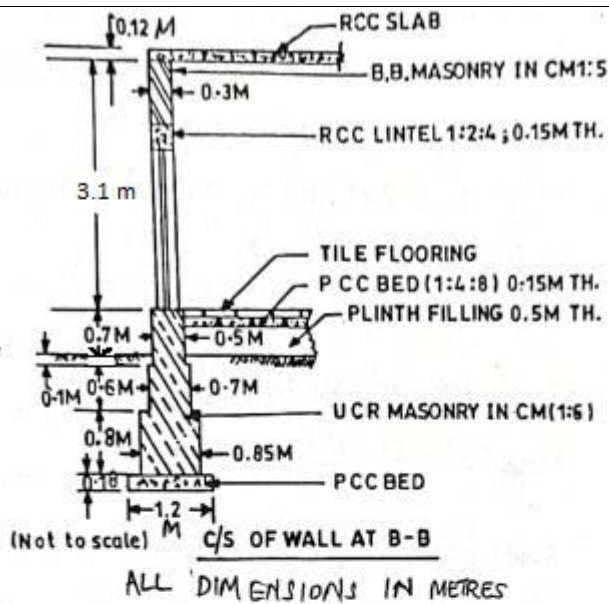
6.	For a hook, in mild steel bar, the additional length so as to make count for the single hook is (where d is diameter of bar)
Option A:	17 d
Option B:	13 d
Option C:	11 d
Option D:	9 d
7.	<p>Calculate the quantity of volume of concrete by using Prismoidal formula in the attached isolated slope footing drawing (Vt+Vb) of figure (Not to scale)</p> 
Option A:	3.03 cubic metre
Option B:	2.03 cubic metre
Option C:	4.03 cubic metre
Option D:	5.5 cubic metre
8.	For finding the estimate for a factory shed steel structure project which approximate estimate method mentioned below is suitable
Option A:	Plinth Area
Option B:	Service Unit
Option C:	Bay Method
Option D:	Cubic Rate
9.	Which type of estimate is prepared and proposed to the authority for administrative approval
Option A:	Supplementary Estimate
Option B:	Revised Estimate
Option C:	Detailed estimate
Option D:	Approximate estimate

10.	Long wall , Short wall method for detailed estimate of load bearing structure which of the following statement is true for finding the excavation quantity
Option A:	long walls are measured in to in and short walls are measured out to out dimensions
Option B:	The total centre line length of all load bearing walls are measured
Option C:	The number of T joints are calculated
Option D:	Long walls are measured out to out and short walls are measured in to in dimensions
11.	The method of trapezoidal formula is based on the assumption that
Option A:	The mid area of a pyramid is double the average area of the ends and the end sections are in parallel planes
Option B:	The mid area of a pyramid is half the average area off the ends and the and sections are in perpendicular planes
Option C:	The mid area of a pyramid is double the average area of the ends and the end sections are in perpendicular planes
Option D:	The mid area of a pyramid is half the average area of the ends and the end sections are in parallel planes
12.	when r1 and r2 are the transverse or cross slopes of the surfaces of the ground at the two ends of a section, the mean harmonics slope r is given by the formula
Option A:	$(r1+r2)/2$
Option B:	$2r1r2/(r1+r2)$
Option C:	$3r1r2/(r1+ r2)$
Option D:	$2r1r2/(r1- r2)$
13.	The calculations for price escalation in labour rates are based on _____.
Option A:	Consumer Price index
Option B:	Retail Price Index
Option C:	Construction Indices
Option D:	Minimum wage index
14.	Complete Security Deposit amount is refundable to the contractor after _____
Option A:	Prescribed Maintenance period
Option B:	Prescribed Completion period
Option C:	Prescribed Mobilization period
Option D:	Prescribed Claim period
15.	The highways and expressways built where toll is collected by private sector company is a type of
Option A:	Turnkey contract
Option B:	BOT contract
Option C:	Lumpsum Contract
Option D:	Percentage rate Contract
16.	What is the full form of DART
Option A:	Dispute Avoidance & Resolution Task Factor
Option B:	Dispute Accumulation & Resolution Task Force
Option C:	Dispute Avoidance & Resolution Task Force
Option D:	Dispute Avoidance & Recommendation Task Factor

17.	Capitalized value is
Option A:	Gross Profit x Year's Purchase
Option B:	Net Profit x Year's Purchase
Option C:	Gross income x Year's Purchase
Option D:	Net annual return x Year's Purchase
18.	Easement Right is the right that an
Option A:	owner of a particular land enjoys over his own property
Option B:	owner of a particular land enjoys over government property
Option C:	owner of a particular land enjoys over any property which he does not possess
Option D:	owner of a particular land enjoys over an adjacent property, which he does not possess
19.	Which of the following properties is not subject to depreciation
Option A:	Building
Option B:	Land
Option C:	Construction Equipments
Option D:	Manufacturing machinery
20.	The value of machinery obtained when it becomes absolutely useless except for sale as junk is
Option A:	Sentimental Value
Option B:	Salvage Value
Option C:	Scrap value
Option D:	Book Value

Subjective / Descriptive questions

Q.2	(A)	Solve any Two	5 marks each
	(i)	Explain in short a) contingencies (1.5 marks) b) work establishment charges (1.5 marks) c) administrative approval (2 marks)	
	(ii)	Explain the contents and how a detail specification should be written.	
	(iii)	Prepare approximate estimate for G+6 R.C.C residential building consisting of four flats per floor and each flat has a carpet area of 80 sq mt. Assume area occupied by walls and columns etc as 8.5 % of built up area and area of circulation as 25% of built up area. Assume cost of construction of superstructure as Rs 20,000/- per sq mt. Assume suitable percentages for services, contingencies and work establishment charges.	
	(B)	Solve any One	10 marks each
	(i)	Work out the quantities of items of work from given plan and section provided in fig a) UCR masonry in cement mortar 1:6 in foundation up to plinth (07 marks) b) 3 cm thick flooring in rooms with polished stone on a bed of cm 1:4 (03 marks)	



(ii) Perform detailed rate analysis for RCC work in M15 grade for slab, lintels, chajja etc excluding reinforcement and shuttering.

Q.3 (A) Solve any Two 5 marks each

(i) Draft a tender inviting notice for advertisement of **e-tender** for the Construction of Transmitter building with limited production facility for setting up of 10 KW FM RADIO, at Ratlam (M.P). The tender is called by Prasar Bharti, Civil Construction Wing, ALL INDIA RADIO.
The work also includes ground sump well, internal roads and path, water supply

		and sanitary, installation and drainage etc. Estimated cost put to tender - Rs. 2,80,25,786/-.																
	(ii)	Explain in short with neat sketch a) Belting Method of valuation (2.5 marks) b) Mass Haul Diagram (2.5 marks)																
	(iii)	Explain in short a) Void and Voidable contract (2.5 marks) b) Liquidated damages of delay and un liquidated damages (2.5 marks)																
	(B)	Solve any One 10 marks each																
	(i)	A property consists of a building having built-up area 200 square metre and a plot measuring 600 square metre. The rate of plot is rupees 12,000 per square metre and present cost of construction is rupees 15,000 per square metre. The building was constructed in 1960 and at present the future life of the building is expected to be 40 years. Assuming 10% salvage value and 5% rate of interest on sinking fund, find out the fair present market value of the property based on land and building.																
	(ii)	<p>Calculate the quantities of earthwork in cutting and banking by Mid Section Method with following data. The ground levels taken for a 7 metre Wide Road are as under</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 5px;">Chainage in metre</td> <td style="padding: 5px;">0</td> <td style="padding: 5px;">30</td> <td style="padding: 5px;">60</td> <td style="padding: 5px;">90</td> <td style="padding: 5px;">120</td> <td style="padding: 5px;">150</td> <td style="padding: 5px;">180</td> </tr> <tr> <td style="padding: 5px;">ground level in metre</td> <td style="padding: 5px;">266.5</td> <td style="padding: 5px;">267.2</td> <td style="padding: 5px;">268.1</td> <td style="padding: 5px;">268.5</td> <td style="padding: 5px;">269.7</td> <td style="padding: 5px;">269.5</td> <td style="padding: 5px;">269.0</td> </tr> </table> <p>Formation level at starting chainage is 270.0 metre. The road surface shall be given a falling gradient, 1 in 60. Side slope 1 in 2 (vertical: horizontal) in embankment and 1 in 1.5 (vertical: horizontal) in cutting. There are no cross slope to the ground.</p>	Chainage in metre	0	30	60	90	120	150	180	ground level in metre	266.5	267.2	268.1	268.5	269.7	269.5	269.0
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ground level in metre	266.5	267.2	268.1	268.5	269.7	269.5	269.0											

University of Mumbai
Examination 2020 under cluster KJSIET

Examinations Commencing from 23rd December 2020 to 6th January 2021 and from 7th January 2021 to 20th January 2021

Program: **CIVIL ENGINEERING**

Curriculum Scheme: Rev2016

Examination: BE Semester VII

Course Code: _CE C702 and Course Name: _Theory of Reinforced Concrete Structures

Time: 2 hour

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry 02 marks each.
1.	In Limit State Method, the value of design stress in steel is
Option A:	0.67fy
Option B:	0.87fy
Option C:	0.002fy
Option D:	0.45fy
2.	A rectangular column section of 250 mm x 400 mm is reinforced with five steel bars of diameter 20 mm and grade Fe500. Grade of concrete is M30. Axial load on the column section with minimum eccentricity as per IS-456-2000 using Limit State Method is
Option A:	1805.30 kN
Option B:	2561.05 kN
Option C:	1707.30 kN
Option D:	1854.75kN
3.	If the stirrup spacing is equal to 0.75 times the effective depth of an RC beam, the shear capacity of stirrup in Limit State Method, is equal to
Option A:	1.16(fyAsv)
Option B:	1.00(fyAsv)
Option C:	0.80(fyAsv)
Option D:	1.25(fyAsv)
4.	What is the value of Neutral Axis constant (k) for M20 concrete and Fe 250 steel in WSM
Option A:	0.29
Option B:	0.40
Option C:	0.57
Option D:	0.87
5.	In the design of footings, critical section for two way shear is taken at
Option A:	The free end of footing
Option B:	Face of the column
Option C:	At a distance d from the face of the column
Option D:	At a distance d/2 from the face of the column
6.	At the limiting state of collapse in flexure, the force acting on the compression

	zone of section is
Option A:	$0.446 f_{ck} b x_u$
Option B:	$0.87 f_{ck} b x_u$
Option C:	$0.36 f_{ck} b x_u$
Option D:	$0.42 f_{ck} b x_u$
7.	A singly reinforced concrete beam of 250 mm width and 700mm effective depth is provided with 1875 sq.mm steel. If the modular ratio (m) is 15, the depth of the neutral axis, is
Option A:	285mm
Option B:	250mm
Option C:	300mm
Option D:	310mm
8.	What is the minimum area of tension reinforcement in beams when Fe 415 is used?
Option A:	0.8%
Option B:	0.12%
Option C:	0.15%
Option D:	0.20%
9.	For two way slabs of shorter span upto 3.5m and loading class upto 3KN/sq.m, the span to overall depth ratio for continuous slabs, provided with High strength deformed bars is
Option A:	40
Option B:	35
Option C:	26
Option D:	32
10.	A reinforced concrete beam is subjected to a flexural moment of 250 kNm, a shear force of 20kN and a torque of 9 kNm. The beam is 300 mm wide and has an overall depth of 400 mm at an effective cover of 40 mm. The equivalent shear force(V_e) for this beam section is (apply LSM)
Option A:	54 kN
Option B:	56 kN
Option C:	68 kN
Option D:	20 kN
11.	The ratio of minimum number of longitudinal bars provided in rectangular columns to those in circular column is
Option A:	1/3
Option B:	2/3
Option C:	4/3
Option D:	3/2
12.	The value of ultimate strain in steel for Fe 500 grade is
Option A:	0.0038
Option B:	0.0020
Option C:	0.0015
Option D:	0.0045

13.	A singly reinforced rectangular concrete beam has a width of 250 mm and an effective depth of 400 mm. The characteristic compressive strength of concrete is 20 MPa and the tensile strength of steel is 250MPa. What would be the limiting value of the moment of resistance of the beam, applying LSM
Option A:	106.4kNm
Option B:	110.4kNm
Option C:	118.4kNm
Option D:	160.4kNm
14.	The percentage of longitudinal reinforcement in a column should be in the range of
Option A:	0.12% to 0.15%
Option B:	0.8% to 4%
Option C:	0.6% to 8%
Option D:	0.8% to 6%
15.	According to IS 456-2000, the minimum cover required for reinforcements in footings shall be
Option A:	50mm
Option B:	40mm
Option C:	30mm
Option D:	25mm
16.	A one way slab is subjected to a factored moment of 20 kNm. Effective depth of slab is 100 mm. Adopt M 20 concrete and Fe 500 steel. What should be the area of main reinforcement for the slab? Apply LSM
Option A:	795.45 sq.mm
Option B:	530.30 sq.mm
Option C:	418.15 sq.mm
Option D:	120 sq.mm
17.	A singly reinforced beam is having a width of 230mm and effective depth 450mm; Tensile reinforcement provided is 1005 sq.mm. Grade of concrete M20 and Grade of steel Fe415. Specify type of section. Use WSM.
Option A:	Balanced section
Option B:	Under reinforced section
Option C:	Over reinforced section
Option D:	Doubly reinforced section
18.	The ultimate shear force at a section of an RCC beam is 200 kN. The shear resisted by concrete is 67.8 kN. What is the shear force for which shear reinforcement is required?
Option A:	200kN
Option B:	267.8kN
Option C:	100kN
Option D:	132.5 KN
19.	A rectangular RC column of size 425 x 550mm is having an unsupported length of 3m. The eccentricity calculated along the longer and shorter directions of the column are respectively
Option A:	24.33mm and 20.17mm

Option B:	23.13mm and 18.97mm
Option C:	17mm and 14.5mm
Option D:	21mm and 18.5mm
20.	A reinforced concrete beam having 300mm width and 420mm effective depth is provided with 4 bars of 12mm diameter. What will be the moment of resistance of this section, if M 20 concrete and Fe 415 steel are used? Apply WSM. Choose the closest answer.
Option A:	38kNm
Option B:	40kNm
Option C:	37.50kNm
Option D:	35kNm

Q2.	Solve any Two Questions out of Three (10 marks each)																											
A	<p>Design a slab on a room of internal dimensions 3.2m x 4.8m. The slab is simply supported on 230mm wall on all four sides. Consider LL 3 kN per sq.m and floor finish of 1.15kN per sq.m. Assume M20 grade of concrete and Fe 415 grade of steel. Draw the cross sectional elevation showing reinforcement details. Serviceability checks not required. Use LSM</p> <table border="1"> <tr> <td>l_y/l_x</td> <td>1.0</td> <td>1.1</td> <td>1.2</td> <td>1.3</td> <td>1.4</td> <td>1.5</td> <td>1.75</td> <td>2.0</td> </tr> <tr> <td>α_x</td> <td>0.062</td> <td>0.074</td> <td>0.084</td> <td>0.093</td> <td>0.099</td> <td>0.104</td> <td>0.113</td> <td>0.118</td> </tr> <tr> <td>α_y</td> <td>0.062</td> <td>0.061</td> <td>0.059</td> <td>0.055</td> <td>0.051</td> <td>0.046</td> <td>0.037</td> <td>0.029</td> </tr> </table>	l_y/l_x	1.0	1.1	1.2	1.3	1.4	1.5	1.75	2.0	α_x	0.062	0.074	0.084	0.093	0.099	0.104	0.113	0.118	α_y	0.062	0.061	0.059	0.055	0.051	0.046	0.037	0.029
l_y/l_x	1.0	1.1	1.2	1.3	1.4	1.5	1.75	2.0																				
α_x	0.062	0.074	0.084	0.093	0.099	0.104	0.113	0.118																				
α_y	0.062	0.061	0.059	0.055	0.051	0.046	0.037	0.029																				
B	A short RC column is subjected to an ultimate load of 1500kN within the limit of minimum eccentricity. Design the column using Limit State method. Draw the reinforcement details. Adopt M25 concrete and Fe 500 steel.																											
C	<p>Design a rectangular RC beam subjected to a factored bending moment of 110 kNm, factored torsional moment of 30 kNm and a factored shear force of 60 kN. The beam is having a width of 300mm and overall depth of 600mm. The effective cover to reinforcement is 50mm. Adopt grade of concrete M20 and grade of steel Fe415. T_{cmax} for M20 concrete is 2.8N per sq.mm. Apply LSM</p> <table border="1"> <tr> <td>P_t</td> <td>≤0.15</td> <td>0.25</td> <td>0.50</td> <td>0.75</td> <td>1.00</td> <td>1.25</td> <td>1.50</td> <td>1.75</td> <td>2.00</td> </tr> <tr> <td>τ_c (N/mm²)</td> <td>0.28</td> <td>0.36</td> <td>0.48</td> <td>0.56</td> <td>0.62</td> <td>0.67</td> <td>0.72</td> <td>0.75</td> <td>0.79</td> </tr> </table>	P_t	≤0.15	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	τ_c (N/mm ²)	0.28	0.36	0.48	0.56	0.62	0.67	0.72	0.75	0.79							
P_t	≤0.15	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00																			
τ_c (N/mm ²)	0.28	0.36	0.48	0.56	0.62	0.67	0.72	0.75	0.79																			
Q. 3	Solve any Two Questions out of Three (10 marks each)																											
A	A T-beam is having an effective width of flange 1250mm and thickness of slab 115mm. Effective depth of the beam is 600mm and width of web is 300mm. Determine the limiting moment of resistance and corresponding area of steel reinforcement. Grade of concrete M20 and grade of steel Fe 415. Apply LSM																											

B	An RC column of size 400 x 400mm carries an axial load of 900kN. Design an isolated pad footing for the column. The safe bearing capacity of soil is 210kN per sq.m. Check for depth of footing by one way shear only. Adopt M15 concrete and Fe 415 steel. Apply LSM									
	P_t	≤0.15	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00
	τ_c (N/mm ²)	0.28	0.35	0.46	0.54	0.60	0.64	0.68	0.71	0.71
C	A rectangular R.C. beam of cross section is 250 x 530mm deep. It has to resist an ultimate moment of 240kNm. Effective cover to reinforcement is 50mm. Design the beam using LSM. Grade of concrete M20 and grade of steel Fe 415. Take $f_{sc} = 353$ N per sq.mm									

University of Mumbai
Examination 2020 under cluster KJSIET

Program: **BE (Civil) (Rev-2016) Choice Based**
Curriculum Scheme: Rev2016
Examination: BE Semester VII

Course Code: CE –C703 Course Name: Water Resources Engineering II

Time: 2 hour

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry 02 marks
1.	For no tension to be develop in the gravity dam the resultant of all the external forces should always lie
Option A:	at the center of the base
Option B:	within the middle third portion of the base
Option C:	within the d/s third portion
Option D:	with In the u/s third portion
2.	For no tension to be develop in the gravity dam the eccentricity of the resultant force should be
Option A:	$<b/3$
Option B:	$<b/4$
Option C:	$<b/6$
Option D:	$<b/12$
3.	If H is the height of water to be stored , S is the specific gravity of the dam material and μ is the coefficient of friction , the base width of the elementary profile satisfying the condition of no tension is given by
Option A:	$H/ \mu S$
Option B:	$H/ \mu (S-1)$
Option C:	H/\sqrt{S}
Option D:	$H/\sqrt{S-1}$
4.	The head water and tail water depth in gravity dam are H and H'. The intensity of uplift pressure at the line of drainage gallery is then given by
Option A:	$w[(H' + 1/3 (H - H')]$
Option B:	$w/3 [(H + H')]$
Option C:	$w[(H' - 1/3 (H - H')]$
Option D:	$w[(H' + 2/3 (H - H')]$
5.	Which type of dam is suitable on shallow pervious foundations?
Option A:	Homogenous embankment type
Option B:	Zoned embankment type
Option C:	Both Non-homogenous type and homogenous type
Option D:	Diaphragm type

6.	During the maintenance of an earthen dam, the apparent seepage through the foundation of the dam is best taken care of, by providing
Option A:	a chimney drain
Option B:	a rock toe
Option C:	a drain trench along the downstream toe
Option D:	an upstream impervious cutoff
7.	The central core of the zoned embankment type earth dam
Option A:	checks the seepage
Option B:	prevents piping
Option C:	gives stability to the central impervious fill
Option D:	distribute the load over a large area
8.	The spillway which can be adopted with ease on gravity as well as earthen dams is
Option A:	chute spillway
Option B:	ogee spillway
Option C:	both ogee and chute spillway
Option D:	straight drop spillway
9.	If the operating head on an ogee spillway is more than the design head then
Option A:	the pressure on the crest will be zero
Option B:	the pressure on the crest will be negative causing cavitations
Option C:	the pressure on the crest will be positive
Option D:	the discharge coefficient of the spillway will be reduced
10.	The device which does not help in energy dissipation at the bottom of a hydraulic structure over which water spills is
Option A:	chute block
Option B:	dentate sill
Option C:	baffle piers
Option D:	morning glory
11.	According to Lacey, in regime conditions
Option A:	Silt is kept in suspension by horizontal components of eddies
Option B:	Entire cross-section of the channel is generated at all points by the forces normal to the wetted perimeter
Option C:	no regime condition in channel
Option D:	only final regime state occurs
12.	when channel is protected on the bed and sides with some protective material and there is no possibilities of change in its cross section , then channel is said to be
Option A:	initial regime
Option B:	final regime
Option C:	permanent regime
Option D:	true regime
13.	According to Kennedy, the critical velocity (V_0) in meters in a channel is the mean velocity which keeps the channel free from silting or scouring. Its value is given by (where m is critical velocity ratio and D is the depth of the channel).

Option A:	$V_0 = 0.84 m D^{0.64}$
Option B:	$V_0 = 0.55 m D^{0.64}$
Option C:	$V_0 = 0.84 m D^{0.54}$
Option D:	$V_0 = 0.55 m D^{0.54}$
14.	The critical velocity ratio was introduced in Kennedys equations of critical velocity to take into account the effect of
Option A:	channel cross section
Option B:	climatic condition
Option C:	silt grade
Option D:	roughness of bed
15.	Lining of irrigation channel
Option A:	increases water logging
Option B:	increases channel cross section
Option C:	increases command area
Option D:	increases chances of breaching
16.	Due to inadequate drainage which factor causes water logging with constant percolation?
Option A:	Over and Intensive Irrigation
Option B:	Impervious Obstruction
Option C:	Inadequate Surface Drainage
Option D:	Flat Topography
17.	In a syphon aqueduct
Option A:	Drainage passes over the canal and F.S.L. of the canal is below the bottom of the drainage trough
Option B:	Drainage passes over the canal and F.S.L. of the canal is above the bottom of the drainage trough
Option C:	Canal passes over the drainage and H.F.L. of the drainage is above the bottom of the canal trough
Option D:	Canal passes over the drainage and H.F.L. of the drainage is below the bottom of the canal trough
18.	The silt exclusion device , constructed on the bed of the main canal , taking off from a headwork , is called
Option A:	Silt excluder
Option B:	Silt ejector
Option C:	Cross regulator
Option D:	Divide wall
19.	When irrigation canal is taken over a drainage channel , the crossing is called
Option A:	An aqueduct
Option B:	A super passage
Option C:	Syphon aqueduct
Option D:	A level crossing
20.	The drainage water is sometimes allowed to join the canal water to augment canal supplies , through a hydraulics structures
Option A:	Canal outlet

Option B:	Canal inlet
Option C:	module
Option D:	Level crossing

Q2	
A	Solve any Two 5 marks each
i.	Explain in details modes of failures of Gravity dam.
ii.	Define and explain seepage line for different condition and location for earthen dam.
iii.	What is ogee spillway and how it is designed?
B	Solve any One 10 marks each
i.	Explain seepage control through earthen dam body as well as foundations?
ii.	<p>Fig shows the section of gravity dam (non-overflow section) built of concrete. Calculate (neglecting earthquake effects). 1) The max vertical stress at heel & toe of the dam. 2) The major principal stress at toe of the dam. Assume Weight of concrete = 24 KN/m³ and unit length of dam. Allowable stress in concrete may be taken as 2500 KN/m².</p>

Q3.	
A	Solve any Two 5 marks each
i.	What is meant by Canal lining? What are its advantages? Discuss the different types of canal lining.

ii.	Differentiate between Canal Head Regulators and Cross regulators
iii.	Differentiate between aqueduct and super passage.
B	Solve any One 10 marks each
i.	What is meant by an Energy dissipater? Discuss the various methods used for energy dissipation below spillway under different relative position T.W.C. and J.H.C.
ii.	Design an irrigation channel in alluvial soil according to Lacey's silt theory given following data: - slope of the channel = 1: 5000, Lacey's silt factors = 0.9, Channel side slope – ½: 1 . Also find the maximum discharge which can be allowed to flow in it.

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Program: **CIVIL Engineering**

Curriculum Scheme: **Rev 2016**

Examination: **BE, Semester VII**

Course Code: **CE-DLO7041** and Course Name: **Prestressed Concrete**

Time: 2 hours

Max. Marks: 80

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Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry 02 marks
1.	When the prestressing is achieved by elements located inside the concrete member (commonly, by embedded tendons) it is called..
Option A:	Chemical prestressing
Option B:	Internal prestressing
Option C:	External prestressing
Option D:	grouting
2.	The phenomena of drying process of contraction concrete refer to...
Option A:	Moisture loss
Option B:	Shrinkage of concrete
Option C:	Drying process
Option D:	Weight loss
3.	A straight tendon at a uniform eccentricity below the centroidal axis is given as _____
Option A:	$-\frac{PeL^2}{4EI}$
Option B:	$-\frac{PeL^2}{16EI}$
Option C:	$-\frac{PeL^2}{14EI}$
Option D:	$-\frac{PeL^2}{8EI}$
4.	For resisting concentrated live loads at quarter span points in a prestressed concrete beam, the ideal shape of tendon profile to be used is..
Option A:	Parabolic
Option B:	Linear

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Option C:	Trapezoidal
Option D:	Circular or hooped tendons
5.	A trapezoidal concrete beam 100 mm wide and 250 mm deep spanning over 8 m , is prestressed by a straight cable carrying an effective prestressing force of 250 kN located at an eccentricity of 40 mm. The beam supports a live load of 1.2 kN/m (assume density of concrete as 24 kN/m ³). The prestressed at top and bottom fibres..
Option A:	0.4 N/mm ² (top) and 19.6 N/mm ² (bottom)
Option B:	0.4 N/mm ² (bottom) and 19.6 N/mm ² (top)
Option C:	1.4 N/mm ² (top) and 9.6 N/mm ² (bottom)
Option D:	1.4 N/mm ² (bottom) and 9.6 N/mm ² (top)
6.	A prestressed concrete beam of rectangular section 120 mm wide and 300 mm deep, spans over 6 m. The beam is prestressed by a straight cable carrying an effective force of 200 kN at an eccentricity of 50 mm. the modulus of elasticity of concrete is 38 kN/mm ² . Deflection due to prestress and self weightis..
Option A:	2.98 mm (upward)
Option B:	2.98 mm (downward)
Option C:	1.40 mm
Option D:	4.38 mm
7.	The final deflection due to all loads including the efforts of temperature, creep and shrinkage should normally exceed span up to_____
Option A:	Span/250
Option B:	Span/300
Option C:	Span/500
Option D:	Span/800
8.	Creep coefficient used for calculating the long term deflection of a prestressed concrete member is influenced by the parameter
Option A:	Notational size of the members
Option B:	Modulus of elasticity

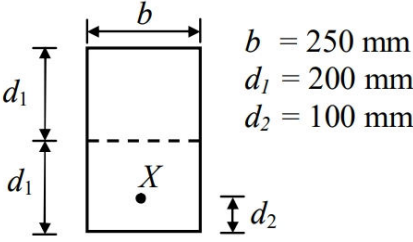
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Option C:	Span of the member
Option D:	Location of the cable
9.	The maximum effective reinforcement ratio of a bonded prestressed concrete beam at failure according to IS: 1343 is limited to a value of
Option A:	0.15
Option B:	0.25
Option C:	0.40
Option D:	0.45
10.	If the neutral axis of the section lies outside the flange then the ultimate moment of resistance of flanged section is?
Option A:	$M_u = f_p A_{pw} (d - 0.4 x_u) + 0.45 f_{ck} (b - b_w) D_f (d - 0.5 D_f)$
Option B:	$M_u = f_p A_{pw} (d - 0.4 x_u) + 0.45 f_{ck} (b - b_w)$
Option C:	$M_u = f_p A_{pw} (d - 0.4 x_u)$
Option D:	$M_u = f_p A_{pw}$
11.	Find minimum range of stresses if f_{ct} is 15 N/mm^2 , f_{cw} is 17, f_{tw} is zero, f_u is -1 N/mm^2 and η is 0.8
Option A:	10 and 16 N/mm^2
Option B:	12 and 15 N/mm^2
Option C:	13 and 14 N/mm^2
Option D:	12 and 18 N/mm^2
12.	In pre tension & post tension members, the value of tensile stress f_p and depth of neutral axis X_u is obtained based on
Option A:	Shear reinforcement
Option B:	Effective reinforcement
Option C:	Edge reinforcement
Option D:	Span reinforcement
13.	Failure of over reinforced prestressed concrete beam is characterized by
Option A:	Large number of cracks with large deflection

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Option B:	Explosive failure due to crushing of concrete in compression zone
Option C:	Sudden failure due to fracture of steel in tension
Option D:	small number of cracks with large deflection
14.	Ultimate shear resistance of concrete beams failing due to web shear cracks depends upon
Option A:	Tensile strength of concrete
Option B:	Compressive prestress in concrete
Option C:	Compressive strength of concrete
Option D:	Width of compression face
15.	A concrete beam is post tensioned by a cable carrying an initial stress of 1000 N/mm ² . The slip at jacking end was observed to be 5 mm. The modulus of elasticity of steel is 210 kN/mm ² . What is the percentage loss of stress due to anchorage slip if the length of the beam is 30 m ?
Option A:	3.5%
Option B:	15%
Option C:	25 %
Option D:	35%
16.	The bursting tensile forces in end blocks with proportion P _i is given as _____
Option A:	$F_{bst} = P_i(0.32-0.3(y_{po}/y_o))$
Option B:	$F_{bst} = f_i(0.32-0.3(y_{po}/y_o))$
Option C:	$F_{bst} = T_i(0.32-0.3(y_{po}/y_o))$
Option D:	$F_{bst} = \pi_i(0.32-0.3(y_{po}/y_o))$
17.	The main plate of the member in the anchorage zone has minimum edge of at least _____ times the corresponding lateral dimension compressive stresses of the anchorage devices
Option A:	1.0
Option B:	1.5
Option C:	2.0

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Option D:	2.5
18.	<p>In a pre-stressed concrete beam section shown in the figure, the net loss is 10% and the final prestressing force applied at X is 750 kN.</p> <p>The initial fiber stresses (in N/mm^2) at the top and bottom of the beam were:</p> <div style="text-align: center;">  <p style="margin-left: 150px;"> $b = 250 \text{ mm}$ $d_1 = 200 \text{ mm}$ $d_2 = 100 \text{ mm}$ </p> </div>
Option A:	4.166 and 20.833
Option B:	-4.166 and -20.833
Option C:	4.166 and -20.833
Option D:	-4.166 and 20.833
19.	The maximum design value of the moment of resistance of rectangular flanged section varies from _____
Option A:	$0.08f_{ck}bd^2$ to $0.2f_{ck}bd^2$
Option B:	$0.11f_{ck}bd^2$ to $0.5f_{ck}bd^2$
Option C:	$0.15f_{ck}bd^2$ to $0.8f_{ck}bd^2$
Option D:	$0.21f_{ck}bd^2$ to $0.9f_{ck}bd^2$
20.	Freyssinet system is based on the principle of
Option A:	Direct bearing on concrete from bolt heads at the end of wires
Option B:	Wedge action producing frictional grip between steel and concrete
Option C:	Looping of the wires around concrete
Option D:	Tensioning of wires and concreting is simultaneously done

Q2	Solve any Two Questions (10 marks each)
A	<p>Calculate the stresses at the centre of span section of the beam for the following load condition:</p> <p>(i) Prestress + self-weight + live load (ii) Prestress +self-weight</p> <p>The beam is an unsymmetrical I-section which supports an imposed load of 2.2 kN/m over</p>

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	<p>a span of 10.0 m. At the centre of the span, the effective prestressing force of 120 kN is located at 50 mm from the soffit of the beam.</p> <p>The sectional details of an I-section are: Top flange – 400mm wide and 80 mm thick, Bottom flange 150 mm wide and 80 mm thick, t of the web is 100mm, and overall depth of the section is 500 mm. Also draw stress distribution.</p>
B	<p>Explain in brief, 'Load Balancing concept'. A prestressed concrete beam of size 400mm wide and 600 mm deep is provided with a parabolic cable profile with maximum eccentricity of 100 mm at mid of 6 m span. If the external load on the beam is 35 kN/m on the whole span. Find the extreme stresses at mid span section by load balancing method. The tendon carries a prestressing force of 1000 kN.</p>
C	<p>Enlist various types of losses in prestress. Calculate the percentage loss of stress in wires of a prestressed concrete beam of size 200mm x 400mm if (a) the beam is pre-tensioned (b) the beam is post tensioned. The beam is 10 m long and provided with wires of area 320 mm² located at a constant eccentricity of 50 mm, carrying an initial stress of 1000 N/mm². Assume</p> <p>Modulus of elasticity for steel is 210 kN/mm² and 35 kN/mm² for concrete. Relaxation of steel stress = 5% of initial stress Shrinkage of concrete = 300 x 10⁻⁶ for pre-tensioning and 200x 10⁻⁶ for post-tensioning. Creep coefficient = 1.6 Slip at anchorage = 1.5 mm Frictional coefficient for wave effect = 0.0015m.</p>
Q3	Solve any Two Questions (10 marks each)
A	<p>Enlist the various factors affecting the deflection of prestressed concrete beam. A Prestressed concrete beam of rectangular section 150 mm wide and 350 mm deep, spans over 6m. The beam is prestressed by a straight cable carrying an effective force of 200 kN at an eccentricity of 50 mm. If its supports an imposed load of 4 kN/m and the modulus of elasticity of concrete is 38 kn/mm², calculate the deflection at the following stages and check whether they comply with the IS:1343 specifications:</p> <p>(a) upward deflection under (prestress+self-weight) (b) Final downward deflection under (prestress + self-weight + imposed load) including the effect of creep and shrinkage. Assume the creep coefficient to be 1.80</p>
B	<p>What are the various systems of prestressing? Explain any one. A concrete beam with a single overhang is simply supported at A and B over a span of 6 m and overhang BC is 1.5 m. The beam is of rectangular section 300 mm wide and 850 mm deep and supports a uniformly distributed live load of 2.2 kN/m over the entire length in addition to its self-weight. Determine the profile of the prestressing cable with an effective force of 500 kN which can balanced the dead load and live load on the beam. Sketch the profile of the cable along the length of the beam.</p>
C	<p>Explain principle of prestressing. What is difference between service and transfer stage. Calculate Efficiency of the sections :</p> <p>I-section, top flange: 400x 200mm; bottom flange 200x 200mm; web 100mm x 600mm; overall depth = 1000mm. T-section, flange 600x 250mm; web 750x 100mm; overall depth = 1000mm</p>

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Examinations Commencing from 23rd December 2020 to 6th January 2021 and from 7th January 2021
to 20th January 2021

Program: **CIVIL ENGINEERING**

Curriculum Scheme: Rev 2016

Examination: BE Semester VII

Course Code: CE-DLO7042 and Course Name: Solid Waste management

Time: 2 hour

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry 02 marks
1.	The term Refuse generally does not include
Option A:	Putrescible solid waste
Option B:	Excreta
Option C:	Non putrescible solid waste
Option D:	Ashes
2.	Which one of the following parameters is not included in the routine characterization of solid waste for its physical composition
Option A:	Moisture content
Option B:	Energy value
Option C:	Particle size analysis
Option D:	Density
3.	Which is the following is biodegradable waste?
Option A:	Polythene bags
Option B:	synthetic fibre
Option C:	Food Waste
Option D:	paper
4.	What is waste generation rate?
Option A:	the amount of waste disposed
Option B:	the amount of waste created by residences or businesses over a certain amount of time (day, year, etc.).
Option C:	the amount of waste transported
Option D:	amount of waste processed
5.	Curb service is a type of
Option A:	House to house collection
Option B:	container collection system
Option C:	landfilling method
Option D:	incineration method
6.	Tilt frame container is a type of
Option A:	Hauled container system
Option B:	stationary container system
Option C:	Alley collection system

Option D:	Curbside collection
7.	Level site is a kind of
Option A:	Curbside collection method
Option B:	Landfill site
Option C:	Transfer station
Option D:	stationary container
8.	The term RDF in solid waste management stands for
Option A:	Refuse dry fuel
Option B:	Reduced dirty fuel
Option C:	Reduced dry fuel
Option D:	Refuse derived fuel
9.	The organic material of the solid waste will decompose
Option A:	By the flow of water
Option B:	By the soil particles
Option C:	By the action of microorganisms
Option D:	By pressure
10.	Bio-medical waste can be effectively managed by the
Option A:	Dumping
Option B:	thermal process
Option C:	Burial
Option D:	Recycling
11.	A good way of dealing with the solid waste problem is
Option A:	Landfilling
Option B:	storing of waste
Option C:	Burning
Option D:	Recycling of waste management plan
12.	What is biogas composed of?
Option A:	O ₂ and CO ₂
Option B:	CO ₂ and NO ₂
Option C:	CH ₄ and O ₂
Option D:	CH ₄ and CO ₂
13.	What is the source of biomedical waste?
Option A:	Hotels
Option B:	Institutes
Option C:	Medical research laboratories
Option D:	Temples
14.	Which of the following are not a three topmost components of e-waste which comprised of
Option A:	Ferrous metal
Option B:	Plastic
Option C:	Clay
Option D:	Non-ferrous meta

15.	Which of the following is a typical hazardous waste?
Option A:	Waste from nuclear plants
Option B:	Waste from paper industry
Option C:	Waste from hotel industry
Option D:	Waste from steel industry
16.	Who is responsible for safe disposal of the generated hazardous waste?
Option A:	Generator
Option B:	Receiver
Option C:	Waste facility
Option D:	TSDf
17.	Which of the following method is not adopted for safe disposal biomedical waste
Option A:	Incineration
Option B:	Landfilling
Option C:	Autoclaving
Option D:	Hydroclaving
18.	In sanitary landfill , Landfill liners are used for
Option A:	prevent Drying of waste
Option B:	prevent fire
Option C:	To prevent migration of landfill leachate and Landfill gases
Option D:	prevent Reactions with nature
19.	Sanitary landfills may cause troubles during
Option A:	Peak Winter
Option B:	Peak summer
Option C:	Peak Monsoons
Option D:	Dry season
20.	What plan should we make to the disposal of solid waste?
Option A:	Integrated Waste Management plan
Option B:	Recycling of waste management plan
Option C:	Reducing of waste management plan
Option D:	Use of waste management plan

Q2 A)	Solve any Two	5 marks each
i.	Explain factors affects rate of Composting?	
ii.	Write a short note on Autoclaving.	
iii.	Explain landfill and its type.	

Q2 B)	Solve any One	10 marks each																								
i.	Estimate the theoretical volume of methane gas that could be expected from anaerobic digestion of one tonne of waste having the composition of $C_{55}H_{110}O_{35}N_2$. $C_aH_bO_cN_d + [(4a - b - 2c + 3d)/4]H_2O \rightarrow [(4a + b - 2c - 3d)/8]CH_4 + [(4a - b + 2c + 3d)/8]CO_2 + dNH_3$																									
ii.	Explain Hauled container system and stationary container system with neat sketches.																									
Q.3.A	Solve any Two	5 marks each																								
i.	Explain the functional elements of municipal solid waste management.																									
ii.	Why transfer stations are necessary? What are the various types?																									
iii.	Write short note on legal aspects of solid waste disposal.																									
Q.3.B	Solve any One	10 marks each																								
i.	Explain with diagram working of Municipal Incinerator. Also explain air pollution control measures adopt in Incinerators.																									
ii.	Estimate (i) Energy content (as discarded) (ii) Energy content on dry basis and (iii) Energy content on ash free dry basis for the same waste sample.																									
	<table border="1"> <thead> <tr> <th>Component</th> <th>% by mass</th> <th>Energy kJ/kg</th> </tr> </thead> <tbody> <tr> <td>Paper</td> <td>40</td> <td>17770</td> </tr> <tr> <td>Cardboard</td> <td>12</td> <td>15800</td> </tr> <tr> <td>Plastics</td> <td>12</td> <td>16400</td> </tr> <tr> <td>Good Wastes</td> <td>16</td> <td>5000</td> </tr> <tr> <td>Garden Wastes</td> <td>8</td> <td>7000</td> </tr> <tr> <td>Wood</td> <td>6</td> <td>19000</td> </tr> <tr> <td>Tin Cans</td> <td>6</td> <td>600</td> </tr> </tbody> </table>	Component	% by mass	Energy kJ/kg	Paper	40	17770	Cardboard	12	15800	Plastics	12	16400	Good Wastes	16	5000	Garden Wastes	8	7000	Wood	6	19000	Tin Cans	6	600	
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Examinations Commencing from 23rd December 2020 to 6th January 2021 and from 7th January 2021 to 20th January 2021

Program: CIVIL ENGINEERING

Curriculum Scheme: Rev 2016

Examination: BE Semester VII

Course Code: CE-DLO7043 and Course Name: Pavement Sub-Grade and Materials

Time: 2 hour

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry 02 marks
1.	As per HRB, which one of the following includes granular soils.
Option A:	A-1
Option B:	A-4
Option C:	A-5
Option D:	A-6
2.	In CBR test, the penetration is applied at the rate of _____mm/minute.
Option A:	1.75
Option B:	1.5
Option C:	1.25
Option D:	2
3.	If LL = 30% and PL = 12%, the value for the plasticity index is _____%
Option A:	30
Option B:	12
Option C:	18
Option D:	42
4.	Which of the below is not an engineering property of soil
Option A:	Permeability
Option B:	Cohesion
Option C:	Specific Gravity
Option D:	Elasticity
5.	The correction to be applied for modulus of subgrade reaction for bending of plates is _____
Option A:	$k_p = 0.9556 * k - 0.0113 * k * k$
Option B:	$k_p = 0.8556 * k - 0.0112 * k * k$
Option C:	$k_p = 0.7556 * k - 0.0111 * k * k$
Option D:	$k_p = 0.6556 * k - 0.0110 * k * k$
6.	Classify the soil using HRB classification system having liquid limit 33%, plastic limit as 22% and % passing 75 microns IS sieve = 20
Option A:	A-2-4
Option B:	A-2-5

Option C:	A-2-6
Option D:	A-2-7
7.	If modulus of subgrade reaction value is more than $5.55 \text{ kg/cm}^2/\text{cm}$, then which of the following correction is not applicable.
Option A:	Bending of Plate
Option B:	Saturation
Option C:	Plate size
Option D:	Load Deflection curve
8.	Following is not a method of field compaction
Option A:	Kneading compaction
Option B:	Pneumatic
Option C:	Impact
Option D:	Corecutter
9.	calculate the rebound surface deflection for a flexible plate if intensity of pressure is 80 Kn/m^2 and young's modulus is $40 \times 10^5 \text{ N/m}^2$ and radius of tyre contact area is 12cm.
Option A:	3.6mm
Option B:	3mm
Option C:	2mm
Option D:	1mm
10.	In a marshall sample, the bulk specific gravity of mix and aggregates are 2.324 and 2.546 respectively. The sample includes 5% of bitumen (by total weight of mix) of specific gravity 1.10. The theoretical maximum specific gravity of mix is 2.441. The void filled with bitumen in the Marshall sample (in %) is
Option A:	68.82
Option B:	60.55
Option C:	52
Option D:	72.89
11.	CBR is a _____
Option A:	Measure of soil strength
Option B:	Flexible pavement design method
Option C:	Rigid pavement design method
Option D:	Measure of soil characteristics
12.	In earthen roads, the common stabilizer used is
Option A:	Cement
Option B:	Lime
Option C:	Bitumen
Option D:	Fly Ash
13.	Which are the two major parameters considered in the Marshall mix design
Option A:	Workability and density
Option B:	Density and durability
Option C:	Workability and stability
Option D:	Density and stability

14.	The liquidity index is defined as a ratio expressed as percentage of
Option A:	$I_l = \frac{(w - w_L)}{I_p}$
Option B:	$I_L = \frac{(w_L - w)}{I_p}$
Option C:	$I_L = \frac{(w_p - w)}{I_p}$
Option D:	$I_l = \frac{(w - w_p)}{I_p}$
15.	The standard load to be considered in CBR Test corresponding to 10.0mm penetration is ____ kg
Option A:	1370
Option B:	2055
Option C:	2630
Option D:	3180
16.	If liquid limit 33%, plastic limit as 22% and % passing 75 microns IS sieve = 20, then group Index is _____
Option A:	4
Option B:	8
Option C:	16
Option D:	20
17.	The width of test pit for plate load test is made 'X' times width of plate 'X'
Option A:	5
Option B:	3
Option C:	2.5
Option D:	2
18.	The seating load for plate load test is _____
Option A:	2 kN/m ²
Option B:	3 kN/m ²
Option C:	4 kN/m ²
Option D:	7 kN/m ²
19.	The IS code number for Plate Load Test is _____
Option A:	IS 1888
Option B:	IS 2720
Option C:	IS 456
Option D:	IS 5214
20.	Toughness index is the ratio of
Option A:	flow index and plasticity index
Option B:	liquidity index and flow index
Option C:	plasticity index and flow index
Option D:	flow index and liquidity index

Q 2. A	Solve any Two	5 marks each
i.	What is the K value after necessary corrections , if the uncorrected k value is 5.2kg/cm ² /cm?	
ii.	Calculate the bulk specific gravity of a compacted bituminous concrete mix from the following data Specimen weight in air =3055.1g Specimen weight in water =1725.7g	
iii.	State the allowable values of CBR of soil as per IRC that can be used for road constructions and embankment	
Q 2. B	Solve any One	10 marks each
i.	What is FHWA 0.45 power gradation curve? Explain its significance for gradation of aggregates for bituminous paving mixes	
ii.	Explain the Suoerpave method of mix deign with a typical gradation chart.	

Q 3. A	Solve any Two	5 marks each																																																							
i.	Enlist the test to be conducted on aggregates and explain any one with code reference																																																								
ii.	Explain the desirable properties of soil as a sub –grade material																																																								
iii.	What is the significance of properties of material in bituminous mix design																																																								
Q 3. B	Solve any One	10 marks each																																																							
i.	Determine the proportion values and final gradation of following per cent passing of three types of mineral aggregates for a proposed bituminous mix.																																																								
	<table border="1"> <tr> <td>Size of sieve</td> <td>19</td> <td>13.2</td> <td>9.5</td> <td>4.75</td> <td>2.36</td> <td>1.18</td> <td>0.6</td> <td>0.3</td> <td>0.150</td> <td>0.075</td> </tr> <tr> <td>Desired gradation</td> <td>100</td> <td>79-100</td> <td>70-88</td> <td>53-71</td> <td>42-58</td> <td>34-48</td> <td>26-38</td> <td>18-28</td> <td>12-20</td> <td>4-8</td> </tr> <tr> <td>Material A</td> <td>100</td> <td>80</td> <td>65.2</td> <td>39.2</td> <td>9</td> <td>2.1</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>Material B</td> <td>100</td> <td>100</td> <td>90</td> <td>81.2</td> <td>71.6</td> <td>52.3</td> <td>38.2</td> <td>25</td> <td>17.8</td> <td>1.1</td> </tr> <tr> <td>Material c</td> <td>100</td> <td>100</td> <td>100</td> <td>100</td> <td>100</td> <td>100</td> <td>99</td> <td>98</td> <td>90</td> <td>84</td> </tr> </table>	Size of sieve	19	13.2	9.5	4.75	2.36	1.18	0.6	0.3	0.150	0.075	Desired gradation	100	79-100	70-88	53-71	42-58	34-48	26-38	18-28	12-20	4-8	Material A	100	80	65.2	39.2	9	2.1	-	-	-	-	Material B	100	100	90	81.2	71.6	52.3	38.2	25	17.8	1.1	Material c	100	100	100	100	100	100	99	98	90	84	
Size of sieve	19	13.2	9.5	4.75	2.36	1.18	0.6	0.3	0.150	0.075																																															
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Material c	100	100	100	100	100	100	99	98	90	84																																															

ii.

A few laboratory test were conducted to design a bituminous mix. Using the following data , calculate the (i) bulk density of compacted mix (ii) bulk density of the compacted mix specimen coated with papffin, (iii) combined specific gravity of the aggregates (iv) percentage of voids present in the compacted mix(v) voids in mineral aggregates (vi) voids filled with bitumen.

Weight of the compacted uncoated specimen in air =1678.4g

Weight of compacted uncoated specimen in water= 864.4g

Weight of compacted specimen (coated with paraffin) in air =1340.9g

Weight of compacted specimen (coated with paraffin) in water =678.3g

The specific gravity of paraffin as 0.91 and maximum specific gravity of mix as 2.539 according to ASTM2041.

Material	Specific gravity	Composition of mineral aggregates((% by weight)	Proportion in mx (% by weight)
Coarse aggregates	2.61	54.5	51.5
Fine aggregates	2.71	38	55.9
Mineral filler	2.69	7.5	7.1
bitumen	1.02	-	5.5

University of Mumbai
Examination 2020 under cluster KJSIET

Examinations Commencing from 23rd December 2020 to 6th January 2021 and from 7th January 2021 to 20th January 2021

Program: **CIVIL ENGINEERING**

Curriculum Scheme: Rev2016

Examination: BE Semester VII

Course Code: CE-DLO7046

Course Name: Foundation Analysis and Design

Time: 2 hour

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry 02 marks
1.	A concentrated load acting on the surface of a soil produces a stress 40 kPa at a depth of 1m below. What will be stress at 2m depth when Boussinesq's expression is to be taken
Option A:	3 kPa
Option B:	5 kPa
Option C:	10 kPa
Option D:	8 kPa
2.	A concentrated load of 50t acts at a point on ground surface then what is the ratio of the vertical stress at depth of 3m and 5m if Boussinesq's equation is applied at that point
Option A:	1.66
Option B:	0.60
Option C:	0.36
Option D:	2.77
3.	A load of 650 kN is applied on thick layer of clay Using Boussinesq's elastic analysis what is the approximate value of the estimated vertical stress at a depth 2m and a radial distance of 1m from the point of application of load
Option A:	55 kN/m ²
Option B:	44 kN/m ²
Option C:	41 kN/m ²
Option D:	37 kN/m ²
4.	Two circular footing of diameter D ₁ and D ₂ are resting on the surface of the same purely cohesive soil. The ration of their gross ultimate bearing capacities is
Option A:	D ₁ /D ₂
Option B:	1
Option C:	(D ₁ /D ₂) ²
Option D:	D ₂ /D ₁
5.	The ultimate bearing capacity of a soil is 300 kN/m ² the depth of foundation is 1m and unit weight of soil is 20 kN/m ³ having factor of safety as 2.5 the net safe bearing capacity is
Option A:	100 kN/m ²
Option B:	112 kN/m ²
Option C:	80 kN/m ²

Option D:	100.5 kN/m ²
6.	The two criteria for determination of allowable bearing capacity of foundation are
Option A:	Tensile failure and compressive failure
Option B:	Tensile failure and settlement
Option C:	Bond failure and shear failure
Option D:	Shear failure and settlement
7.	The group efficiency of driven piles in sand at a close spacing may be
Option A:	Equal to 100%
Option B:	Greater than 100%
Option C:	Below than 100%
Option D:	Zero
8.	The negative skin frictions on a pile develops when
Option A:	The soil in which it is driven is sandy soil
Option B:	The soil surrounding it settles more than the pile
Option C:	The ground water table rises
Option D:	The soil near the tip is clay
9.	The load carrying capacity of a bored pile in sand is about _____ times of a driven pile
Option A:	2/3 to 3/4
Option B:	more than 1.25
Option C:	3/4 to 1.25
Option D:	1/2 to 2/3
10.	In general shear failure, continuous failure developed between
Option A:	Ground surface and footing
Option B:	Foundation and the ground surface
Option C:	Middle of the footing
Option D:	Edge of the footing and ground surface
11.	An earthquake is said to be damaging when the Richter number is
Option A:	5 to 5.9
Option B:	6 to 6.9
Option C:	>8
Option D:	<4
12.	The major seismic waves are
Option A:	Compound waves
Option B:	Tension waves and translation waves
Option C:	Body waves and surface waves
Option D:	Rayleigh waves
13.	When a body is subjected to dynamic loading which is one of the way of deformation
Option A:	Settlement
Option B:	Extensional
Option C:	Bulking

Option D:	Bond failure
14.	Most of the damages due to earthquake are caused by
Option A:	P- waves
Option B:	Love waves
Option C:	Compound waves
Option D:	Surface waves
15.	A sheet pile wall fails in one of the case
Option A:	Failure by shear
Option B:	Failure of anchors
Option C:	Failure by buckling
Option D:	Failure due to SBC
16.	Horizontal timber plants placed by hand as the excavation proceeds are referred
Option A:	Wales
Option B:	Compression members
Option C:	Lagging
Option D:	Sheeting
17.	In the design of a cantilever sheet pile wall the calculated depth is increased arbitrarily by 20% to allow
Option A:	The development of passive resistance
Option B:	The reduction of active thrust
Option C:	Sufficient grip
Option D:	Erosion
18.	The foundation constructed by excavating the soil in such a way that the weight of the structure built on the soil is nearly equal to the total weight of the soil excavated from the ground including the weight of water in the soil before the construction of the structure is called
Option A:	Strip footing
Option B:	Strap footing
Option C:	Pile foundation
Option D:	Floating foundation
19.	The grip length below the maximum scour level for the railway bridges is usually taken as
Option A:	50% of the maximum scour depth
Option B:	25% of the maximum scour depth
Option C:	Same as the scour depth
Option D:	Double the scour depth
20.	A caisson which is open at top and closed at bottom
Option A:	Wells
Option B:	Pneumatic caissons
Option C:	Cylinders
Option D:	Box caissons

Q2	Solve any Two Questions	10 marks each
A	A footing 3m square carries a gross pressure of 350 kN/m^2 at a depth of 1.2m in sand. The saturated unit weight of sand is 20 kN/m^3 and unit weight above water table is 17 kN/m^3 . The angle of internal friction is 30° , $N_q=22$ and $N_\gamma=20$. Calculate the factor of safety with respect to shear failure when water table is at 1.2m below the ground level.	
B	A sheet pile 6m above the dredge line is having unit weight of soil as 17.3 kN/m^3 and angle of internal friction is 30° . Water table situated at 3m from the ground level. The saturated unit weight is 19.5 kN/m^3 . Compute the total height of the sheet pile if there is the presence of clay below the dredge line having $c=57.5 \text{ kPa}$.	
C	Design a square pile group to carry 400 kN in clay with unconfined compression strength of 60 kN/m^2 . The piles are 30 cm diameter and 6 m long. Adhesion factor may be taken as 0.6.	

Q3.		
A	Solve any Two	5 marks each
i.	State the difference between various shear failures observed while studying shallow foundation.	
ii.	Write short note on Negative skin Friction	
iii.	Explain the forces acting on well foundations	
B	Solve any One	10 marks each
i.	Derive the expression of depth of embedment for anchored Cantilever sheet in cohesion-less	
ii.	Enlist the assumptions of Boussinesq Theory and derive the expression for Boussinesq equation of vertical stress under concentrated load	

University of Mumbai

Examination 2020 under cluster ALL (Lead College: VCET)

Examinations Commencing from 7th January 2021 to 20th January 2021

Program: ALL_Institute Level Optional Course 1

Curriculum Scheme: Rev2016

Examination: BE Semester VII

Course Code: ILO 7016 and Course Name: Cyber Security and Laws

Time: 2 hour

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	Which of the following are wireless attacks?
Option A:	MAC Spoofing , Phishing
Option B:	Eavesdropping,, MAC Spoofing
Option C:	Phishing, Repudiation
Option D:	Eavesdropping , Non- Repudiation
2.	This attack can be deployed by infusing a malicious code in a website's comment section.
Option A:	Cross Site Request Forgery (XSRF)
Option B:	SQL injection
Option C:	HTML Scripting
Option D:	Cross Site Scripting (XSS)
3.	The Objective of Firewalls is to protect?
Option A:	Data Driven Attacks
Option B:	Unauthorized Access
Option C:	Confidentiality
Option D:	Integrity
4.	The user activities are sniff and forward this information as a background process to the attackers
Option A:	Adware
Option B:	Malware
Option C:	Spyware
Option D:	Warms
5.	It is a class of computer threat?
Option A:	Stalking
Option B:	Phishing

Option C:	DOS attacks
Option D:	Soliciting
6.	Someone posing as IT tech requests information about your computer configuration. What kind of attack is this?
Option A:	Whaling
Option B:	Social Engineering
Option C:	Insider Threat
Option D:	Phishing
7.	The Primary objective of worm is to Spread the infection from....
Option A:	computer to computer
Option B:	File to file on a computer
Option C:	Website to website
Option D:	Router to routers
8.	It is usually targeted by nature where the emails are exclusively designed to target any exact user.
Option A:	Algo-based phishing
Option B:	Vishing
Option C:	Domain Phishing
Option D:	Spear phishing
9.	In this attack, someone is repeatedly harassed to individuals or organizations using any electronics means.
Option A:	Identity theft
Option B:	Phishing
Option C:	Cyber stalking
Option D:	Bullying
10.	It is a kind of attempts by individuals to get confidential or sensitive information from a individuals to falsifying their identity?
Option A:	Identity theft scam
Option B:	Phishing scams
Option C:	Spyware scams
Option D:	Trojan horse Scam

11.	It cannot be exploited by assigning or by licensing the rights to others.
Option A:	Designs
Option B:	Patents
Option C:	Copy rights
Option D:	Trademark
12.	Which of following would not gain copyright protection?
Option A:	A DVD
Option B:	An unrecorded speech
Option C:	Written lyrics of a song
Option D:	A hand knitted jumper
13.	Which one of the following statements is true?
Option A:	The definition of an invention is set out in the Patents Act 1977.
Option B:	Copyright must be registered in order to gain protection.
Option C:	A patent must be registered in order to gain protection.
Option D:	The owner of a patent cannot sell it but can prevent others using his invention.
14.	Which one of the following is outside the scope of IT Act 2000
Option A:	Electronic message
Option B:	Electronic Evidence
Option C:	Power of Attorney with digital signature
Option D:	Electronic gift
15.	Which Act casts responsibility on body corporate to protect sensitive personal information and provide punishment for offences by companies.
Option A:	IT Act 2000
Option B:	Indian Evidence Act 1872
Option C:	Indian penal code
Option D:	IT (Amendment)Act 2008
16.	What is the proposed punishment for Cyber Terrorism in IT Act?
Option A:	10 year imprisonment
Option B:	Life Imprisonment

Option C:	5 year imprisonment
Option D:	1 Lac rupees penalty
17.	Which of the following NERC Standard provide cyber-security framework for identification and protection of critical cyber assets to support the reliable operation of BES
Option A:	CIP-001
Option B:	CIP-002
Option C:	CIP-002 through CIP-009
Option D:	CIP-003
18.	Standard CIP-002 is used for
Option A:	Critical cyber asset identification
Option B:	Electronic Security Perimeter
Option C:	Physical Security of Critical cyber assets
Option D:	Sabotage reporting
19.	Which of the following are part of key provisions of Sarbanes-Oxley Act ?
Option A:	Physical Security of Critical cyber assets
Option B:	Bulk Electric System (BES)
Option C:	Critical assets
Option D:	Corporate Responsibility for financial reports
20.	ISO 27000 was originally published in ____ as the BS 7799 by the British Standards Institute (BSI)
Option A:	1995
Option B:	1998
Option C:	2000
Option D:	2012

Q2 (20 Marks)	
A	Solve any Two 5 marks each
i.	Explain Active and Passive Attacks with example
ii.	Explain how Appeal can be made under the IT Act 2000
iii.	Explain Key IT Requirement of GLBA/GLB
B	Solve any One 10 marks each
i.	How Criminal Plan the Attack? Explain various steps

ii.	Explain E-Contracts. Discuss E-Contracts Act 1872.
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Q3. (20 Marks)	
A	Solve any Two 5 marks each
i.	Explain Bluetooth Hacking with various tools
ii.	Explain Vishing, Phishing and Smishing in Cyber Security
iii.	Explain Key IT Requirement of FISMA
B	Solve any One 10 marks each
i.	Explain how Intellectual Property Laws protect the rights of the owner of the Intellectual Property
ii.	Explain Key features of Indian Information Technology Act 2000.

University of Mumbai
Examination 2020 under cluster ALL (Lead College:)
Examinations Commencing from 7th January 2021 to 20th January 2021
Program: ALL_Institute Level Optional Course 1
Curriculum Scheme: Rev2016
Examination: BE Semester VII
Course Code: ILO 7018 and Course Name: EAM

Time: 2 hour

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	Energy that is available in market for definite price is known as
Option A:	Renewable energy
Option B:	Commercial energy
Option C:	Non-commercial energy
Option D:	Traditional energy
2.	As per the report "BP Statistical Review of World Energy-2014", for how many years the coal reserve in India available for energy production?
Option A:	500
Option B:	300
Option C:	100
Option D:	200
3.	Which source of energy dominates the energy production mix in India?
Option A:	Natural gas
Option B:	Coal
Option C:	Oil
Option D:	Nuclear
4.	Assisting and implementing ENCON recommendation measures and monitoring the performance are done in
Option A:	Pre Audit phase
Option B:	Audit phase
Option C:	Post Audit phase
Option D:	Pre and Audit phase
5.	The height of a column in a pump is called as
Option A:	Horizontal head
Option B:	Static head
Option C:	Multi head
Option D:	Vertical head
6.	What covers study of Variations occurring in energy costs, availability and reliability of supply of energy, energy mix, identify energy conservation technologies, retrofit for energy conservation equipment.
Option A:	Performance assessment

Option B:	Energy Audit
Option C:	Energy reliability
Option D:	Energy planning
7.	Which type of audit offers the most accurate estimate of energy savings and cost?
Option A:	Preliminary Audit
Option B:	Detailed Audit
Option C:	Overall Audit
Option D:	Secondary Audit
8.	Obtaining site drawings like building layout, steam, air distribution, electricity distribution are performed in which phase of audit?
Option A:	Post Audit phase
Option B:	Pre Audit phase
Option C:	Audit phase
Option D:	In between Pre and Post Audit phase
9.	Power factor can be improved by connecting which among these?
Option A:	Semiconductor device
Option B:	Resistors
Option C:	Inductor
Option D:	Static capacitors
10.	Fixed charge and Variable charge are dependent on what factor for HT consumer?
Option A:	Average load ,Energy consumption
Option B:	Energy consumption, Maximum Demand
Option C:	Maximum demand, Energy Consumption
Option D:	Maximum demand ,Peak load demand
11.	Energy savings potential of variable torque applications compared to constant torque application is:
Option A:	Higher
Option B:	Equal
Option C:	Lower
Option D:	Does not depend on Torque
12.	Electronic soft starters are used for motors to:
Option A:	improve the loading
Option B:	provide smooth start and stop
Option C:	achieve variable speed
Option D:	provide jerk during starting
13.	For large space lighting we prefer
Option A:	Time based control
Option B:	day light based controllers
Option C:	Localized Switching
Option D:	Photo sensors
14.	Formation of bubbles in an impeller is called
Option A:	Cavitation

Option B:	Defects
Option C:	Friction
Option D:	Heat burn
15.	If no instrument other than tachometer is available, what method you would suggest for measuring the motor load?
Option A:	Slip method
Option B:	Input power measurement method
Option C:	Line current measurement method
Option D:	Terminal voltage method
16.	In lighting performance assessment ILER stands for
Option A:	International Lighting Energy Regulation
Option B:	Indian Lighting Efficiency Regulation
Option C:	Installed Load Efficacy Ratio
Option D:	Interior Lighting Energy Ratio
17.	To have lighting performance assessment satisfactory to good, ILER value must be
Option A:	0.75 and above
Option B:	0.5 and less
Option C:	between 0.25 to 0.5
Option D:	below 0.25
18.	Which LEED rating system requires durability?
Option A:	LEED for Schools
Option B:	LEED for Commercial Interiors
Option C:	LEED for Homes
Option D:	LEED for Existing Buildings: Operation and Maintenance
19.	Photovoltaic cell converts solar energy into
Option A:	Heat energy
Option B:	Electric energy
Option C:	Mechanical energy
Option D:	Chemical energy
20.	Which insulation material is used for high temperatures
Option A:	Magnesia
Option B:	Polyurethane
Option C:	Expanded Polystyrene
Option D:	Calcium Silicate

Q2	
A	Solve any Two 5 marks each
i.	Explain any FIVE special features of green building.
ii.	Explain advantages of power factor improvement.
iii.	A pump is filling water in to a rectangular overhead tank of 5 m x 4 m with a height of 8 m. The inlet pipe to the tank is located at height of 20 m above ground. Pump suction : 3 m below pump level Overhead tank overflow line : 7.5 m from the bottom of the tank Power drawn by motor : 5.5 kW Motor efficiency η : 92% Time taken by the pump to fill the overhead tank up to overflow level : 180 minutes. Find the pump efficiency.
B	Solve any One 10 marks each
i.	What is the need of energy audit and explain types of energy audit.
ii.	Describe General fuel economy measures in furnaces

Q3	
A	Solve any Two 5 marks each
i.	Explain Benchmarking and its types.
ii.	A 7.5 kW, 415 V, 15 A, 970 RPM, 3 phase rated induction motor with full load efficiency of 86 % draws 7.5 A and 3.23 kW of input power. Find the percentage loading of the motor.
iii.	Explain what is thermal insulations and its benefits.
B	Solve any One 10 marks each
i.	Describe energy saving opportunities in water pumps.
ii.	Explain energy conservation opportunities in lighting controls.

University of Mumbai
Examination 2020 under cluster ALL(Lead College: VCET)

Examinations Commencing from 7th January 2021 to 20th January 2021

Program: ALL_Institute Level Optional Course 1

Curriculum Scheme: Rev2016

Examination: BE Semester VII

Course Code: ILO 7011 and Course Name: Product Life Cycle Management

Time: 2 hour

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	_____ is not a phase under product life cycle management
Option A:	Introduction
Option B:	Growth
Option C:	Maturity
Option D:	Rotation
2.	In _____ phase extensive advertisement is needed for product promotion
Option A:	Introduction
Option B:	Growth
Option C:	Maturity
Option D:	Decline
3.	In _____ phase profit level reaches to its maximum peak
Option A:	Introduction
Option B:	Growth
Option C:	Maturity
Option D:	Decline
4.	In _____ phase product sales reaches to minimum and profit is also lowest
Option A:	Introduction
Option B:	Growth
Option C:	Maturity
Option D:	Decline
5.	_____ is not a benefit of PLM
Option A:	Product life cycle analysis
Option B:	Profit maximization
Option C:	Decision making
Option D:	Large investment
6.	In _____ design model approach simultaneous and interlinked design activities are carried out
Option A:	Integrated
Option B:	Individual
Option C:	Isolated
Option D:	Dual

7.	_____ engineering is also called as simultaneous engineering.
Option A:	Concurrent
Option B:	Combine
Option C:	Linear
Option D:	Parallel
8.	_____ emphasizes the multidisciplinary approach in the product development process
Option A:	Concurrent engineering
Option B:	Dual engineering
Option C:	Rotational Engineering
Option D:	Realistic engineering
9.	_____ is not a step under new product development.
Option A:	Idea generation
Option B:	Concept development
Option C:	Idea screening
Option D:	Sensitivity analysis
10.	In ____ product is customized according to the customer wishes and product prepared as per specific requirement of customer.
Option A:	Product configuration
Option B:	Product rotation
Option C:	Product division
Option D:	Product linearization
11.	PDM stands for _____
Option A:	Product Data Management
Option B:	Product Development Management
Option C:	Product Dispatch Management
Option D:	Product Distinct Manament
12.	_____ is not the benefit of PDM
Option A:	It centralizes and control data
Option B:	It removes unnecessary data
Option C:	It improves data management
Option D:	It increases cost and time
13.	_____ is not the feature of PDM
Option A:	It facilitates better use of resources
Option B:	Engineering changes can be controlled easily
Option C:	Lead time gets reduced
Option D:	Consumes more time and resources
14.	_____ is not the component of virtual product development
Option A:	Virtual product design
Option B:	Virtual simulation
Option C:	Digital manufacturing
Option D:	Supply chain management

15.	DMU stands for _____
Option A:	Digital Mock up Unit
Option B:	Digital Manufacturing Unit
Option C:	Digital Maintenance Unit
Option D:	Differential Manufacturing Unit
16.	_____ is a realistic rendering technique of creating an image by tracing the path of light
Option A:	Ray tracing
Option B:	Ray casting
Option C:	Radiosity
Option D:	Radiography
17.	DFE stands for _____
Option A:	Design for excellence
Option B:	Design for efficiency
Option C:	Design for environment
Option D:	Design for economy
18.	DFE focuses on _____ factor
Option A:	Economy
Option B:	Energy
Option C:	Efficiency
Option D:	Environment
19.	LCA stands for _____
Option A:	Life Cycle Assessment
Option B:	Life Cycle Analysis
Option C:	Life Cycle Assembly
Option D:	Life Cycle Achievement
20.	LCCA stands for
Option A:	Life Cycle Class Achievement
Option B:	Life Cycle Creative Assessment
Option C:	Life Cycle Combine Assessment
Option D:	Life Cycle Cost Analysis

Q2 (20 Marks)	Solve any Four out of Six 5 marks each
A	<i>Explain product data management in detail.</i>
B	<i>Explain virtual product development tools in detail.</i>
C	<i>Explain the concept of sustainable development.</i>
D	<i>Explain virtual manufacturing in detail.</i>
E	<i>Explain product data management along with its advantages.</i>
F	<i>Explain the framework of life cycle assessment.</i>

Q3. (20 Marks)	Solve any Two Questions out of Three 10 marks each
A	<i>Explain life cycle phases in detail.</i>

B	<i>Explain product life cycle strategies in brief.</i>
C	<i>Explain various product development tools in detail.</i>

University of Mumbai
Examination 2020 under cluster ALL(Lead College: VCET)
Examinations Commencing from 7th January 2021 to 20th January 2021
Program: ALL_Institute Level Optional Course 1
Curriculum Scheme: Rev2016
Examination: BE Semester VII
Course Code: ILO 7019 and Course Name: Development Engineering

Time: 2 hour

Max. Marks: 80

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0701_R16_ALL_VII_ILO7019_QP1

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Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	Which of the following was the first committee on Panchayati raj in India
Option A:	Balwant Rai Mehta
Option B:	Ashok Mehta
Option C:	L.M.Singhvi
Option D:	S. Mohinder Singh
2.	When is National Panchayati Day celebrated
Option A:	23rd December
Option B:	1st June
Option C:	24th April
Option D:	15th September
3.	73rd amendment gave practical shape to which article of the constitution
Option A:	Article 14
Option B:	Article 32
Option C:	Article 40
Option D:	Article 51
4.	The multi-dimensional poverty index is a measure developed by the
Option A:	UNCTAD
Option B:	World Bank
Option C:	International Monetary Fund IMF
Option D:	Oxford poverty and human development initiative , OPHDI , and the UNDP
5.	Which of the following system is established on the basis of direct election
Option A:	Gram Panchayat
Option B:	Block Committee
Option C:	Zila Parishad
Option D:	District
6.	Engagement of local people in development project refers to
Option A:	Economic development
Option B:	Socila development
Option C:	Participatory development
Option D:	Sustainable development

7.	Panchayats are constituted for
Option A:	four years
Option B:	five years
Option C:	six years
Option D:	three years
8.	Bread labour means
Option A:	To earn one's livelihood by engaging in manual labour
Option B:	Hard physical labour
Option C:	Labour for making bread
Option D:	Engaging in agriculture
9.	The Human Development Index ranks the countries based on their performance in the key areas of (1) health, (2) sex-ratio, (3) education (4) access to resources
Option A:	1,2,3
Option B:	2,3,4
Option C:	1,3,4
Option D:	1,2,4
10.	Which one of the following is not a correct statement ?
Option A:	Growth is quantitative and value neutral
Option B:	Development means a qualitative change which is always value positive
Option C:	Positive growth and development refer to changes over a period of time
Option D:	Both growth and development refer to changes over a period of time.
11.	Which of the following elements must always be in the mind of the engineer while performing his duties vis-à-vis Ethics (1) public safety, (2) economy, (3) health, (4) welfare
Option A:	1,2,3
Option B:	1,2,3,4
Option C:	1,4
Option D:	1,3,4
12.	According to Gandhi, 'Enjoy the wealth by renouncing it' is the essence of
Option A:	Trusteeship
Option B:	Sarvodaya
Option C:	Swaraj
Option D:	Ramarajya
13.	The term that refers to principles, values, beliefs that define right or wrong behaviour is
Option A:	Customer satisfaction
Option B:	Innovation
Option C:	Ethics
Option D:	Empowerment
14.	In which five year plan the Panchayat Raj System was introduced in India for the first time
Option A:	First

Option B:	Second
Option C:	Fifth
Option D:	Sixth
15.	Which of the following is an appropriate general principle with regard to engineering ethics
Option A:	The engineer shall regard his duty to the public welfare as paramount to all other obligations
Option B:	The engineer shall regard his duty to the objectives of the company as paramount to all other obligations
Option C:	The engineer shall regard his duty to the Profession of engineering as paramount to all other obligations
Option D:	The engineer shall regard his duty to his excellence as paramount to all other obligations
16.	Those individuals who raise ethical concerns to others inside or outside the organisation are called
Option A:	Entrepreneur
Option B:	Whistle blower
Option C:	Social entrepreneur
Option D:	Social impact management
17.	Which of the following is not a key intervention to improve governance
Option A:	Facilitating independent and inclusive journalism
Option B:	Capacity building of government officials
Option C:	Advocacy for policy design and implementation
Option D:	Employment for all
18.	Which of the following is not in the 11 th schedule of subjects
Option A:	Fisheries industry
Option B:	Safe drinking water
Option C:	Markets and fairs
Option D:	Large irrigation projects
19.	The following is not a stated objective of Self Help Groups
Option A:	Provide employment to the members
Option B:	Create awareness about rights
Option C:	Foster a sense of community
Option D:	Entrepreneurship development
20.	Those individuals who raise ethical concerns to others inside or outside the organisation are called
Option A:	Entrepreneur
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Option C:	Social entrepreneur
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Q2	Solve any Four out of Six	5 marks each
A	Explain the provisions of the 74 th amendment	
B	What is the scope of information and communication technology in rural India	
C	Define ethics and ethical dilemma	
D	What are the important components of Green Revolution	
E	What are the various steps taken for inclusion of women and the members of the reserved category in decision making	
F	Why was there a need to set up rural co-operatives	

Q3	Solve any Four out of Six	5 marks each
A	Briefly discuss the various rural development schemes in India	
B	What is the importance of ethical conduct in business	
C	Human Development Index is a barometer of a nation's progress- Comment on this while giving specific examples to prove your point	
D	What are self help groups (SHG)? Explain their significance in rural development	
E	Discuss any 2 initiatives of the Government of India towards urban development	
F	What are the functions of Panchayat Samiti	

University of Mumbai
Examination 2020 under cluster ALL (Lead College: VCET)

Program: **ALL_Institute Level Optional Course 1**

Curriculum Scheme: Rev2016

Examination: BE Semester VII

Course Code: ILO 7017

Course Name: Disaster Management and Mitigation Measures

Time: 2 hour

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	Which of the following is NOT occurred as a consequence of earthquake
Option A:	Tsunami
Option B:	Fire
Option C:	Damage to building
Option D:	Drought
2.	Which of the following is NOT the natural cause of flood .
Option A:	River bank erosion
Option B:	Poor natural drainage
Option C:	Heavy rain
Option D:	Deforestation
3.	Terrorism is a _____ type of disaster
Option A:	Man made
Option B:	Natural
Option C:	Both natural and man made
Option D:	Neither natural nor man made
4.	World Health Organization (WHO) was established in
Option A:	1950
Option B:	1948
Option C:	1947
Option D:	1960
5.	Who heads NDMA, the apex body for Disaster management
Option A:	Home Minister
Option B:	Finance Minister
Option C:	Prime Minister
Option D:	Home Secretary
6.	Which of the following is a disaster mitigation strategy?
Option A:	Constructing cyclone shelters

Option B:	Giving loans from banks
Option C:	Providing cheap electricity
Option D:	Providing school uniforms to children
7.	Which of the following organization is the apex authority of disaster management in India?
Option A:	NDA
Option B:	NDMA
Option C:	CDMA
Option D:	INDR
8.	If the deficiency of a particular year's rainfall more than 50 % of normal it is termed as
Option A:	Onset of Drought
Option B:	Moderate Drought
Option C:	Severe Drought
Option D:	Simple Drought
9.	Magnitude of earthquake indicates amount of _____.
Option A:	vibrations per second
Option B:	vibrations per minute
Option C:	Oscillations
Option D:	energy released
10.	By which Act, N.I.D.M got the statutory organization status?
Option A:	National Disaster Policy Act 1999
Option B:	NDMP 2019
Option C:	Disaster Management Act 2005.
Option D:	National DM Policy 2009
11.	Amateur Radio is also known as?
Option A:	Ham radio
Option B:	Home radio
Option C:	Pocket radio
Option D:	Silent radio
12.	What are the three phases of disaster management planning?
Option A:	Preparation, Response and Recovery
Option B:	Preparation, Planning and Perception
Option C:	Evacuating, Rebuilding and Re-branding
Option D:	Planning, Evacuating and Recovery
13.	Cyclones, Heat wave , Climate change are part of _____ disaster.
Option A:	The Geological Disaster
Option B:	The Hydrological Disasters
Option C:	The Meteorological Disasters
Option D:	The Chemical Disaster

14.	The Indian Tsunami Early Warning Centre (ITEWC) established at Indian National Centre for Ocean Information Sciences is located in
Option A:	Chennai
Option B:	Kochi
Option C:	Goa
Option D:	Hyderabad
15.	In _____ in 2013 cloudburst created the flash flood situation to cause heavy damage to lives and property.
Option A:	Uttarakhand
Option B:	Chennai
Option C:	Kashmir
Option D:	Karnataka
16.	When was the updated & revised National Disaster Management Plan was prepared?
Option A:	2016
Option B:	2019
Option C:	2018
Option D:	2017
17.	Which of the following is the best thing to do during heavy lightning?
Option A:	lie on the ground in an open place
Option B:	Go into a water body
Option C:	Stay indoors, away from metallic doors and windows
Option D:	Stand under a tall tree
18.	The given three actions are arranged for which step i) The planning ii) The training and iii) The supply
Option A:	The prevention step
Option B:	Recovery step
Option C:	The preparation step
Option D:	The recovery step
19.	The Vision of _____ is “To build a safer and disaster resilient India by a holistic proactive technology driven and sustainable development strategy that involves all stake holders and fasters a culture of Prevention, preparedness and Mitigation.
Option A:	N.D.R.F
Option B:	N.D.M.A
Option C:	S.D.R.F
Option D:	N.I.D.M
20.	S.D.R.F Stands for
Option A:	State Disaster Response Fund
Option B:	State Disaster Relief Fund
Option C:	State Dedicated Relief Fund
Option D:	State Dynamic Response Fund

Q2	Solve any Four out of Six	5 marks each
A	State and describe the measures to prevent the global warming.	
B	Define “Nuclear Disaster “and describe the effects of Nuclear disasters in India	
C	What are the long term and short-term effects of disaster?	
D	What are the main phases of Disaster Management?	
E	Describe the importance and the methods to create public awareness in Disaster management?	
F	Explain the role of Government Agencies in Relief fund raising for Disaster management.	

Q3.	Solve any Two Questions out of Three	10 marks each
A	Write detail note on occurrence, causes and measurement of earthquake. List out some of the major earthquakes occurred in India	
B	Explain the role of NGO’s in post disaster scenario and during rehabilitation.	
C	State Do’s and Don’ts in case of various disasters.	

University of Mumbai
Examination 2020 under cluster ALL(Lead College: VCET)

Examinations Commencing from 7th January 2021 to 20th January 2021

Program: ALL_Institute Level Optional Course 1

Curriculum Scheme: Rev2016

Examination: BE Semester VII

Course Code: ILO 7012 and Course Name: Reliability Engineering

Time: 2 hour

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	The Bathtub curve indicates failure probability, Which stage is NOT normally associated with the bathtub curve? _____
Option A:	Pulling the plug where production is halted due to unacceptable level of failures
Option B:	Infant-mortality where failures occur early
Option C:	Wear-out where failure increases due to age
Option D:	Normal-life where few failures occur
2.	Three components each with a reliability of 0.9 are placed in series. What is the reliability of the system ?
Option A:	0.729
Option B:	0.125
Option C:	0.00258
Option D:	0.989
3.	. If A is a perfect subset of B and $P(a) < P(b)$, then $P(B - A)$ is equal to _____
Option A:	$P(a) / P(b)$
Option B:	$P(a) P(b)$
Option C:	$P(a) + P(b)$
Option D:	$P(b) - P(a)$
4.	In order to maintain maintainability in the system, repair time must _____
Option A:	be increased
Option B:	be reduced
Option C:	kept constant
Option D:	keeps on changing
5.	What refers to wear out failure _____.
Option A:	Depends upon the subject
Option B:	Depends upon type of the experiment
Option C:	Increasing failure rate
Option D:	Decreasing failure rate
6.	Find median and mode of the messages received on 9 consecutive days 15,11,9, 5,18,4,15,13,17.
Option A:	13,6
Option B:	13,18

Option C:	18,15
Option D:	15, 16
7.	The reliability of a device comprised of various parts functioning in series is the :
Option A:	Product of the reliabilities
Option B:	Sum of the probabilities of the unreliabilities
Option C:	Product of the unreliabilities
Option D:	Sum of the reliabilities
8.	Which among the following exhibits inversely proportional relationship with the reliability?
Option A:	Production cost
Option B:	Maintenance and repair cost
Option C:	Design and development cost
Option D:	Availability
9.	If 'm' is the mean of a Poisson Distribution, then variance is given by _____
Option A:	m^2
Option B:	$m^{1/2}$
Option C:	m
Option D:	$\frac{m}{2}$
10.	Which of the following is not considered a reliability design method_____.
Option A:	Parts selection
Option B:	Choice of technology
Option C:	Accessibility
Option D:	Derating
11.	Markov analysis is a technique that deals with the probabilities of future occurrences by_____.
Option A:	Using Bayes' theorem
Option B:	Analyzing presently known probabilities
Option C:	Time series forecasting
Option D:	The maximal flow technique
12.	Skewness of Normal distribution is _____
Option A:	Negative
Option B:	Positive
Option C:	0
Option D:	Undefined
13.	The design function which assigns probability of failures between components or subsystems is called:
Option A:	Significance
Option B:	Prediction
Option C:	Qualification
Option D:	Apportionment
14.	What is MTTR

Option A:	Mean Time To Restore
Option B:	Mean Time To Repair
Option C:	Mean Time To Recovery
Option D:	Mean Time to Restoration
15.	The inherent availability can be calculated for repairable system as:
Option A:	$A_I = \frac{MTBF}{MTTF + MTTR}$
Option B:	$A_I = \frac{MTTF}{MTTF + MTTR}$
Option C:	$A_I = \frac{MTTF}{MTBF + MTTR}$
Option D:	$A_I = \frac{MTTR}{MTTF + MTTR}$
16.	Three companies A, B and C supply 25%, 35% and 40% of the notebooks to a school. Past experience shows that 5%, 4% and 2% of the notebooks produced by these companies are defective. If a notebook was found to be defective, what is the probability that the notebook was supplied by A?
Option A:	44/69
Option B:	25/69
Option C:	13/24
Option D:	11/24
17.	What would happen, if an equipment possesses reliability and maintainability to the maximum extent in accordance to MTTR?
Option A:	Failure rate is higher & downtime is longer
Option B:	Failure rate is lower & downtime is longer
Option C:	Failure rate is higher & downtime is shorter
Option D:	Failure rate is lower & downtime is shorter
18.	All fault-tolerant techniques rely on
Option A:	Integrity
Option B:	Dependability
Option C:	Redundancy
Option D:	Reliability
19.	What is the Major Key parameter of maintainability?
Option A:	Accessibility
Option B:	Vulnerability
Option C:	RCS
Option D:	Survival
20.	Which of the following is the biggest impact of availability
Option A:	mean time
Option B:	median time
Option C:	downtime
Option D:	maximum time of repair

Q2	Solve any Four out of Six	5 marks each
A	Tests performed on a self-diagnostic module for a complex electronic system resulted in correct diagnostics of a known fault 98% of time with only a 1% false reading when it was known there were no faults present. The Probability of a failure (fault) occurring over the test period is 0.005. How reliable is the self-diagnostic module?	
B	<p>Consider the system below. Do the following</p> <p>a) Assume that all components are identical and independent, and have a reliability $R(t)$. Find the expression for the system reliability.</p> <p>b) Assume the components have exponentially distributed failure times with parameter λ. Develop an expression for the failure rate of the system $\lambda_s(t)$.</p>	
	<pre> graph LR In(()) --- C1[1] C1 --- J1(()) J1 --- C5[5] J1 --- J2(()) J2 --- C2[2] J2 --- C4[4] C2 --- C3[3] C4 --- C3 C3 --- Out(()) </pre>	
C	Explain measures of Availability.	
D	Obtain reliability of Parallel system containing of n components, when the reliability of each component is known. Assume that the units are non-repairable.	
E	Explain the Failure Mode Effects analysis	
F	Explain Reliability Block Diagram with example	

Q3	Solve any Two out of Three	10 marks each
A	Explain Bath Tub Curve, Hazard rate, failure density and Failure Rate with help of suitable example	
B	It is known that 5% of the book bound at a certain bindery have defective bindings. Find the probability that 2 of 100 books bound by this bindery will defective binding using the Poisson approximation to the binomial distribution.	
C	Explain Reliability Improvement methods with suitable example	