Numerical Answers to Exam Question

Academic Year : 2020-2021 **Semester :** 2 **Course Code :** CV0001

Course Title : Civil Engineering and Sustainable Built Environment

Tabulated By : Wang Zhiwei

Question No	Answer
Section A, Q2	a). 286, 429; b) 39215.

Numerical Answers to Exam Question

Academic Year : 2020-2021 **Semester :** 2 **Course Code :** CV1011

Course Title : Mechanics of Materials

Tabulated By : Ivan Au/Zhao Zhiye

Question No	Answer
1a(i)	24.5 N.m
1a(ii)	x = -2 m
1b(i)	Ay = 2.59 N, Cx= -4 N, Cy = 0.41 N
1b(ii)	2.99 N (Tension)
2a	RA = 8 kN, RC = -5 kN
2c	x = 3 m
3a(i)	224kN
3b	0.07 deg
4a(ii)	2.07MPa at -22.5 deg; -12.1MPa at 67.5 deg
4b	5.31MPa

Numerical Answers to Exam Question

Academic Year : 2020-2021 **Semester :** 2 **Course Code :** CV1012

Course Title : Fluid Mechanics

Tabulated By : Lim Siow Yong

Question No	Answer
1a	FR = 532 N, direction is correct
1b	PB-PA = 38900Pa, delta h = 0.3m
2a	Tou (y=0.5m) = 0.00235N/m2, Tou (y= 1m) = 0.00166 N/m2
2b	h = 3.5m
3a, 3b, 3c	see notes
3d	9810N, 0,075 m3/s, 33.75m
4a	see notes
4b	0.02m/s, laminar, 0.04 m/s
4ci	0.307 m3/s
4cii	Q1 = 0.556, Q2 = 0.115, Q3 = 0.671 m3/s, HJ = 44.7 m

Numerical Answers to Exam Question

Academic Year : 2020-2021 **Semester :** 2 **Course Code :** CV1013

Course Title : Civil Engineering Materials

Tabulated By : Yang En-Hua

Question No	Answer
1(b)	2.48%
2(a)	Their percentage is 7%. Percent of primary ferrite = 0.75 (%) carbon fraction in steel Percent of primary cementite Fe3C = 1.21 (%) carbon fraction in steel
2(b)	For ferrite: 0.025% C, Percent of ferrite = (6.7-0.8)/(6.7-0.025) = 88.4% For cementite: 6.7% C, Percent of cementite = 1- 0.884= 11.6%
3(C)	38oC
3(d)	(ii) Nominal maximum size of aggregate = 2.36 mm (iii) Fineness modulus of aggregate = 2.57 (iv) Percentage of fines passing the 600 μm sieve = 60%
4(b)	60 MPa
4(c)	0.65 / 1.54

Numerical Answers to Exam Question

Academic Year : 2020-2021 **Semester :** 2 **Course Code :** CV2011

Course Title : Structural Analysis I

Tabulated By : Li Bing

Question No	Answer
Q1	266.7 KN ;266.7 KN FJ and HJ =62.5 KN HK=16.7 KN©
Q2	7.65; 217.5;108 KNs M – 486, 486 187.5 KNm
Q3	1/128; 1/24 ; 0.29l
Q4	37/384; 5/24

Numerical Answers to Exam Question

Academic Year : 2020-2021 **Semester :** 2 **Course Code :** CV2012

Course Title : Structural Analysis II

Tabulated By : Qian Shunzhi/Zhao Ou

Question No	Answer
Q1	(a) Ma(max-)=-600kNm, Cy(max+)=280kN (b) FBE(max)=14.13kN(T)
Q2	(a) By=4.5kN(downwards) (b) By=1.5kN (upwards)
Q3	(a) MAB=0, MBA=169.63, MBC=-88.66, MBE=-80.96, MCB=43.55, MCD=-64.51, MCF=20.97, MDC=80.21
	(b) MAB=0, MBA=-320.4, MBC=320.4, MBE=0, MCB=479.49, MCD=-209.68, MCF=-269.82, MDC=7.66
Q4	(a) MAB=0, MBA=59, MBD=-59, MDB=10, MDE=-10, MED=0
	(b) MAB=0, MBA=33.69, MBD=-33.69, MDB=10, MDE=-10, MED=0

Numerical Answers to Exam Question

Academic Year : 2020-2021 **Semester :** 2 **Course Code :** CV2014

Course Title : Geotechnical Engineering

Tabulated By : Wu Wei

Question No	Answer
1(a)(i)	40°
1(a)(ii)	
1(a)(iii)	33°
1(a)(iv)	
1(b)(i)	400 kPa
1(b)(ii)	30°
1(b)(iii)	
1(b)(iv)	close to 200 kPa
1(b)(v)	smaller than 877.4 N
2(a)	
2(b)(i)	0.33, 2 kPa, 22 kPa, 30 kPa, 84 kPa
2(b)(ii)	2 kPa, 15.33 kPa, 18.67 kPa, 30 kPa, 84 kPa, 10 kPa
2(b)(iii)	207 kN/m, 210.33 kN/m, 3.33 kN/m
3(i)	
3(ii)	
3(iii)	
3(iv)	1.13
3(v)	
4(a)	73.62%
4(b)	13.92-18.38%

4(c)	

Numerical Answers to Exam Question

Academic Year : 2020-2021 **Semester :** 2 **Course Code :** CV2016

Course Title : Hydrology

Tabulated By : Tan Soon Keat

Question No	Answer
1b	Y = B + A Log(T); Annual series A=110; B = 39; Partial Duration Series A=99, B=61
1c	Diversion Canal; T =6; max daily rainfall = 138 mm Spillway; T=200; max daily rainfall = 291 mm
2a	T = 198 m^2/day; S = 0.25
2b (i)	s at 05da, 80, 1000 days = 4.756,7.277,8.532, respectively; difference (pack loss) 0.244, 0.234, 0.268 resprectively; radius of influence 30.0, 379.5,1341.6 m, respectively
2b (ii)	projected drawdown at t = 1500 day 3.067, 1.536 m
2b(iii)	drawdown at 500 day = 2.521, 0.991 m; groundwater level 0.546, 0.546m
3c	41.44 m3/s
3d	day 3 peak , runoff ended on day 8
4a(i)	43.74 sq km
4a(ii)	peak 34.4 m^3/s
4a(iii)	peak 157.5 m^3/s
4b	peak 14.24 m^3/s at t=5 hour
4c	peak 12.59 m^3/s at t=5 hour

Numerical Answers to Exam Question

Academic Year : 2020-2021 **Semester :** 2 **Course Code :** CV2019

Course Title : Matrix algebra and numerical methods

Tabulated By :

Question No	Answer
1a	[1 -1 0]^T + x3*[-1 0 1]^T. Other forms of general solution can also be accepted.
1b	e + c*f-d*(f+2)=0
1c	i) [-0.5 0.5; 0.25 0.25]; ii) 2.5; iii) 7.91km
2a	i) 2 +/- sqrt(2), [-1+sqrt(2), 1]^T; ii) 3.85Hz
2b	i) P = 3x3 identity matrix; |Q| = 1; ii) -[0.5 0.5 0; 0.5 0.5 0; 0 0 0]
3a	Distance travelled = 477 m
3b	i) V(t) = 47.0 + 9.5(t-6) - 0.0417(t-6)(t-8)(t-10)
3b	ii) 75.6 km/hr or 21 m/s
3b	iii) 2.55 m/s^2
3c	2.5 m/s^2
4a	ii) x_1 = e+0.2, y_1 = 2.7183; x_2 = e+0.4, y_2 = 2.7311
	iii) 0.393 %
4b	t = 0.190

Numerical Answers to Exam Question

Academic Year : 2020-2021 **Semester :** 2 **Course Code :** CV3012

Course Title : Steel Design

Tabulated By : LIE SENG TJHEN

Question No	Answer
1. (a)	Point loads at B & D = 150 kN
	Point load at C = 300 kN
2. (a)	Reactions RA = RB = 245.25 kN
	Maximum moments at B & C = 588.6 kNm
3. (a)	Compression action Ned = 1348.0 kN
	My,Ed = 20.253 kNm; Mz,Ed = 2.103 kNm
3. (b)	Effective length Lcr,y = 4.93 m
	Effective length Lcr,z = 4.93 m
3. (c)	Effective lengths Lcr = L = 5.8 m
	Yes, the column is still adequate to resist the total actions.
4. (a)	Nt,Rd = Nu,Rd = 149.296 kN
4. (b)	Lamda,z,bar = 0.740; Lamda,eff,z,bar = 0.868
	Nb,Rd = 476.377 kN
4. (c)	Shear resistance of one Dia16mm bolt = Fv,Rd = 60.288 kN
	Shear resistance of two Dia20mm bolt in double shear = Fv,Rd = 376.320 kN

Numerical Answers to Exam Question

Academic Year : 2020-2021 **Semester :** 2 **Course Code :** CV3016

Course Title : Construction Technology and Processes

Tabulated By : Ting Seng Kiong

Question No	Answer
1	Essay
2	Essay
3a(i)	$67,392
3a(ii)	$84,672
3a(iii)	$87,552
3a(iv)	$85,032
4	Essay

Numerical Answers to Exam Question

Academic Year : 2020-2021 **Semester :** 2 **Course Code :** CV4113

Course Title : Highway Engineering

Tabulated By : Lum Kit Meng

Question No	Answer
1(a)	At 80 mm, MR = 2,000 MPa; At 330 mm, MR = 360 MPa; At 500 mm, MR = 60.5 MPa; At 800 mm, MR = 54.2 Mpa
2(a)	3.085 x 106 ESAL
2(b)	Total fatigue consumed = 172.6% and total erosion damage = 147.1%
3(a)	d = 5.39 mm
3(b)	S = 44.53 m and spacing of inlets is at 33m
4	Total noise level = 70.556 dB

Numerical Answers to Exam Question

Academic Year : 2020-2021 **Semester :** 2 **Course Code :** CV4119

Course Title : Advanced Prefabrication and Precast Construction

Tabulated By : Prof Lau Joo Ming

Question No	Answer
1c	Z=36.43X10^6MM^3
1d	28.34 or 6.38N/mm^2
1e	4T28mm dia
2a	top -4.37N/mm^2 Bottom -10.82N/mm^2
2b	top -3.14/mm^2 Bottom -12.05N/mm^2
2c	M=211.9kNm
3b	day 1- 7.43%, 97.75%,6.53m^3/day
	day 2- 8.29%, 98.84%,5.49m^3/day
	day 3 -8.29%, 41.18%,2.66m^3/day
4b	40.343x10^6mm^3, 30N/mm^2
	214.22kNm, 19.39N/mm^2

Numerical Answers to Exam Question

Academic Year : 2020-2021 **Semester :** 2 **Course Code :** EM9101

Course Title : Environmental Quality

Tabulated By : Fei Xunchang

Question No	Answer
1	-
2	-
3	-
4	-
5	-
6	-
7	TS = 722 mg/L TVS = 338 mg/L TSS = 242 mg/L VSS = 156 mg/L TDS = 480 mg/L
8	-

Numerical Answers to Exam Question

Academic Year : 2020-2021 **Semester :** 2 **Course Code :** EM9106

Course Title : Environmental Impact Assessment

Tabulated By : Tuti Mariana Lim

Question No	Answer
2(b)(i)	65.4 years
5(a)(i)	$\sigma_y = 410m \quad ; \quad \sigma_z = 700\ m$
5(a)(ii)	1306 g/s
5(a)(iii)	1965 g/s
5(b)(i)	219.66 days

Numerical Answers to Exam Question

Academic Year : 2020-2021 **Semester :** 2 **Course Code :** EM9107

Course Title : Environmental, Health and Safety Management

Tabulated By : FANG Mingliang

Question No	Answer
1	Descriptive question.
2	2d ii 0.77
3	3a1 85.2dBA
4	Descriptive question.
5	Descriptive question.

Numerical Answers to Exam Question

Academic Year : 2020-2021 **Semester :** 2 **Course Code :** EN0001

Course Title : Sustainability Practices for Urban and Marine Environment

Tabulated By : Zhou Yan

Question No	Answer
1	NA
2	NA
3	NA
4	NA
5a, 5b	NA
5c	1400kg per capita per year
6	NA

Numerical Answers to Exam Question

Academic Year : 2020-2021 **Semester :** 2 **Course Code :** EN0002

Course Title : Envrionmental issues and sustainability

Tabulated By : Zhou Yan

Question No	Answer
1	NA
2a-2e	NA
2f	274 Lpcd
3a	NA
3b	1400 kg per capitaper year
4	NA
5	NA

Numerical Answers to Exam Question

Academic Year : 2020-2021 **Semester :** 2 **Course Code :** EN1001

Course Title : Environmental Chemistry

Tabulated By :

Question No	Answer
1(b)	Cation=4.02 meq/L, Anion = 3.67 meg/L
1(c)	165 mg/L
1(d)	117.5 mg/L
2(a)	299 kg
2(b)	5119.58 kg/year
2(c)	negitive 268.15 KJ/mole
3(b)	9.3 atm

Numerical Answers to Exam Question

Academic Year : 2020-2021 **Semester :** 2 **Course Code :** EN2003

Course Title : Water Supply Engineering

Tabulated By : Edmond Lo and Liu Yu

Question No	Answer
Q1	(a) (i) Q1=Q3=0.05, Q2=0.07, Q4=0.03, Q5=0.12 with all Q's in m3/s (ii) 6.64m and -40.27m (iii) ΔQ's of -0.012 & 0.037 m3/s, new Q2=0.021 m3/s; (iv) 3.64m (b) K=8fL/(gpi^2D^5), α=2
Q2(a)(i)	80.2 h
Q2(a)(ii)	40.5 s
Q2(b)(iii)	24.6 mg/L and 46.6 mg/L
Q3(c)	73.8 atm and 24.9 atm
Q4(a)	0.94 m
Q4(d)(ii)	175 mg/L and 80 mg/L

Numerical Answers to Exam Question

Academic Year : 2020-2021 **Semester :** 2 **Course Code :** EN3004

Course Title : Air Pollution Control Engineering

Tabulated By : Tuti Lim

Question No	Answer
1(a)	AQI = 270.3
1(d) (i)	steady state [CO] =9.7 mg/m^3
1(d) (ii)	54 minutes
2(c)	σ_z (600m) = 40 m ; σ_y (600m) = 70 m
2(d)	0.167 $\mu g/m^3$
3(b) (i)	2.18 $x10^{-6}$ km/h
3(c) (i)	28.3%
4(a) (i)	49.3%

Numerical Answers to Exam Question

Academic Year : 2020-2021 **Semester :** 2 **Course Code :** EN4102

Course Title : Membrane Water Reclamation Technology

Tabulated By : She Qianhong

Question No	Answer
1c	47.5 bar
3a	30 mg/L
4b	(i) 0.95; (ii) 169.7 (round up to 170)
5a	100 days; 0.2 day

Numerical Answers to Exam Question

Academic Year : 2020-2021 **Semester :** 2 **Course Code :** MT2004

Course Title : Mathematics II for Maritime Studies

Tabulated By : Edmond Lo, Tuti Lim and Wang Zhiwei

Question No	Answer
Q1	(a) 11.45 years, 2027; (b) 7.63 years, 2023
Q2	(a) r=3 and s≠-1 (no solution); r=3 and s=-1 (multiple solution) and r ≠3 (unique solution) ; (b) a = 2 and particular solution : x^2y^2 - 6y + 4x =12
Q3	(a) [T-->D-->C-->A-->O with pathlength of 19; (b) T-->E-->C-->A-->O with pathlength of 16
Q4	(b) BFS is $(0,0,0,10,8,7)^T$, Z=0; next iteration BFS is $(0,0,2,0,6,3)^T$, Z=8
Q5	(a). Lamda= (12,12,12,9,8,6); Mu=(2,4,6,9,12,16) (b) L=3.32

Numerical Answers to Exam Question

Academic Year : 2020-2021 **Semester :** 2 **Course Code :** MT3006

Course Title : SHIP CHARTERING

Tabulated By : Capt Tan Kim Hock

Question No	Answer
5	Demurrage payable to owners
	1d 2h (26 H) / 24 x 2500
	>>> USD 2708.33
	*** Allowed LT = 5500/1200 i.e. 4d 14h

Numerical Answers to Exam Question

Academic Year : 2020-2021 **Semester :** 2 **Course Code :** MT4003

Course Title : MARITIME STRATEGY

Tabulated By : YUEN KUM FAI

Question No	Answer
1	NA
2	NA
3	NA
4	(a) 14.5% (b) $116.27 million
5	(a) -0.68 (b) 0.25, 1.77

Numerical Answers to Exam Question

Academic Year : 2020-2021 **Semester :** 2 **Course Code :** MT4102

Course Title : Distribution and Warehousing

Tabulated By : Chiu Sai Hoi, Benson

Question No	Answer
1a	255 units
1b	660 units
1c	330 units
1d	585 units
1e	1,245 units
3a	total warehousing cost is > 4.499m

Numerical Answers to Exam Question

Academic Year : 2020-2021 **Semester :** 2 **Course Code :** MT4103

Course Title : Port Planning and Operations

Tabulated By : Chiu Sai Hoi, Benson

Question No	Answer
3a	24 quay cranes

Numerical Answers to Exam Question

Academic Year : 2020-2021 **Semester :** 1 **Course Code :** SU2001

Course Title : URBAN PLANNING and DESIGN

Tabulated By : Wang Zhiwei

Question No	Answer
2(a)	180,198; 140,214; 467156;103,656