Answers to the Exam's Questions for AY1718 Semester 2

Code	Course Title	Question	Answer
CV0001	Civil Engineering and Sustainable Built Environment	Section A	
		Q1	C
		Q2	C
		Q3	B
		Q4	D
		Q5	C
		Q6	B
		Q7	B
		Q8	A
		Q9	C
		Q10	C
		Q13	T
		Q14	T
		Section B	
		Q1b)	30 mins
		Section C	
		Q1	A
		Q2	D
		Q3	B
		Q4	D
		Q5	B

CV0002	Engineers and Society	Q1(a)	iv
		Q1(b)	ii
		Q1(c)	ii
		Q1(d)	iii
		Q1(e)	iv
		Q1(f)	ii
		Q1(g)	iv
		Q1(h)	iii
		Q1(i)	i
		Q1(j)	iii

CV1011	Mechanics of Materials	Q1(a)	T = 34.6kN, R1 = 6.5kN, R2 = 13.5kN
		Q1(b)	F_{CF} =11.18 kN(T) F_{BG} =11.18 kN(T) F_{FG} =-20 kN (C)
		Q2(b)	σs = 315.66MPa, σa = 39.46MPa
		Q3(a)	q0,max = 6.87kN/m Vmax = 471.24kN
		Q4(a)	52.2°
		Q4(b)	σ =-0.78MPa, τmax =2.02MPa, σ1 =1.63MPa , σ2 =-2.41MPa

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CV1012	**Fluid Mechanics**	**Q1(a)**	D
		Q1(b)	D
		Q1(c)	B
		Q1(d)	B
		Q1(e)	C
		2(a)	1.189
		2(b)	1.414
		3(ci)	1356.9kPa
		4(b)	0.5m
		4(ci)	Q2 = 0.256, Q3 = 0.181, Q4 = 0.362
		4(cii)	D_{BC} = 0.533m

CV1013	**Civil Engineering Materials**	**Q1(c)**	2.30%
		Q2(a)	Above 727 deg, 6.78% cemenite, 93.22% austenite Below 727 deg, 82.4& ferrite, 17.6& cementite 6.78% along boundary of pearlite 10.82% embedded in pearlite
		Q3(di)	2.56
		Q3(dii)	1.2%
		Q4(e)	1.6MPa

CV2011	**Structural Analysis I**	**Q1(b)**	Rpy = 5kN, Rpx = 0kN RI = 17.5kN RD = -13.75kN Ray = 12.5kN Rax = -10kN
		Q1(c)	Fcb = 0, Fgj = 3.53kN, Fln = 5kN
		2(b)	Ray = 14kN, Rby = 14kN
		Q3(ai)	$R_C = 8\ kN\ (\uparrow)$ # $R_A = 7\ kN\ (\uparrow)$
		Q3(aii)	32.5mm
		Q3(b)	0.00741 rad (↻)
		Q4(a)	1.73 mm # (←)
		Q4(b)	0.0136 rad
CV2012	**Structural Analysis II**	**Q1(a)**	-220kNm
		Q1(b)	55.5kN, 13kN
		Q2(ai)	$C_y = 34.2\ kN\ (\uparrow)$
		Q2(aii)	$C_y = 32.13\ kN\ (\uparrow)$
		Q3(a)	MAB = 0, MBA = 90, MBC = -90, MCB = 60, MCE = 20, MEC = 10, MCD = 40, MDC = 20
		Q3(b)	MAB = 0, MBA = 90, MBC = -90, MCB = -60, MCE = -73.3, MCE = -73.3, MEC = -36.7, MCD = 253.3, MDC = 326.7

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CV2014	**Ground Engineering**	**Q1(ai)**	259kPa
		Q1(aii)	45kPa
		Q1(bi)	50kPa
		Q1(biii)	150kPa, 86.6kPa
		Q2(ai)	376kPa
		Q2(aii)	304kPa
		Q2(b)	2m
		Q2(c)	72.8kPa
		Q3(b)	1.69m
		Q3(d)	34.41kPa
		4(a)	2.14m

CV2016	**Hydrology**	**Q2(ai)**	0.005
		Q2(aii)	0.975
		Q2(aiii)	0.025
		Q2(c)	16.8m
		Q4(b)	78.7m3/s
		Q5(a)	108km2
		Q5(c)	447,000m3, 3hr

CV2019	**Matrix Algebra & Computational Methods**	**Q1(bi)**	$x_3 = \alpha.\ x_2 = 5 + 3\alpha,\ x_1 = -2 - \alpha$
		Q1(bii)	2 or -6
		Q1(ci)	0.25
		Q1(cii)	2.7
		Q2(aiii)	1 or 0
		Q2(bi)	$v = 5.$ $w = 1.$ $\lambda_3 = -1.$ $\mathbf{x}_3 = \begin{bmatrix} -1 \\ -1 \\ 1 \end{bmatrix}$
		Q3(aii)	12.6414
		Q3(aiii)	0.6698
		Q3(bi)	F-1170MN, ZF = 21.1m
		Q3(bii)	0.960, -0.390
		Q4(c)	0.02

CV3012	**Steel Design**	**Q(2(a-2)i)**	Kcr = 0.7, L = 4.2m Kcr - 0.85, L = 5.1m
		Q(2(a-2)ii)	Kcr = 0.7, L = 4.2m Kcr - 0.85, L =3.4m
		Q3(a)	N_{ed} = 2266kN, $M_{y,Ed}$=22.704kNm, $M_{z,Ed}$ = 16.555kNm
		Q4(a)	84703.889 mm2
		Q4(b)	$c = 63.845$ mm & $c = -309.345$ mm (inadmissible) t = 25.568mm

CV3016	**Construction Technology and Processes**	**Q2(ci)**	10
		Q2(bii)	$28,931

CV4107	**Engineering Economics & Finance**	**Q1(a)**	Project C
		Q2(aiii)	Y = 34,820.28, X = 8,117.15
		Q3(bii)	1.4, 0.1
		Q4	5 yrs

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CV4111	**Ground Engineering**	**Q1(d)**	0.63
		Q1(e)	4.92m
		Q1(ci)	13.57 year
		Q1(cii)	0.36 year
		Q1(e)	196.25kN
		Q3(aiii)	1.35 to 1.53
		Q4(a)	357kN/m
		Q4(b)	U = 43.5, T= 266
		Q4(c)	76.8

CV4113	**Highway Engineering**	**Q3(a)**	73.8dB
		Q3(b)	4.03m or nominally 4m width
		Q5(ai)	1.41 min
		Q5(aii)	0.01024
		Q5(aiii)	22.43m or nominally 22m

CV4116	**Coastal Engineering**	**Q2(ai)**	2.45m to 78m
		Q2(aiii)	0.23m/s
		Q3(a)	0.0945m
		Q4(a)	134.3
		Q4(b)	475kg

CV4119	**Advanced Prefrabication and Precast Construction**	**Q1(a)**	10.61kN
		Q1(b)	7.98kN
		Q1(c)	8.78kN
		Q2(a)	Zx = 8.85 x 10^6, Zy = 30.10 x 10^6
		Q2(b)	5757kN
		Q2(c)	403.3kNm

CV8011	**Human Resources Management and Entrepreneurship**	No Numerical Answer

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Code	Course Title	Question	Answer
EN0001	Sustainability Practices for Urban and Marine Environment	Q1(i)	c
		Q1(ii)	d
		Q1(iii)	c
		Q1(iv)	b
		Q1(v)	b
		Q1(vi)	b
		Q1(vii)	b
		Q1(viii)	a
		Q1(ix)	c
		Q1(x)	d
		Q3(e)	722,338, 242,156, 480
EN1001	Environmental Chemistry	Q1(b)	149
		Q1(c)	50.8
		Q1(d)	7.2
		Q2(b)	183.7 kg
		Q2(c)	2.8x10^-12
		Q2(d)	183.42
		Q2(b)	11.18, 4.33
		Q4(ii)	84.5g
		Q4(iii)	9.2h
EN2003	Water Supply Engineering	Q1(d)	132mm
		Q1(e)	0.278m^3/s, 3000m^3
		Q2(bi)	144kg/day
		Q2(bii)	0.4mg/L
		Q3(ai)	4.6
		Q3(aii)	0.87
		Q3(aiii)	250
		Q3(aiv)	0.147
		Q3(av)	16.9%
		Q3(avi)	43m
		Q3(b)	29.8
		Q4(ai)	3,1,0.5,2,1.6,1.6,0.7
		Q4(aiii)	4, 2, 2
		Q4(c)	25.3
EN3004	Air Pollution Control Engineering	Q2(c)	392.2
		Q2(cii)	380m
		Q3(a)	99.99%
		Q3(bi)	5, 0.336mm or 6, 0.28mm
		Q4(ai)	7.68kg/d
EN4102	Membrane Water Reclamation Technology	Q2(a)	12.39
		Q2(b)	112
		Q2(c)	2.54
		Q3(a)	48
		Q4(ai)	1.8x10^12
		Q4(aii)	B

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Code	Course Title	Question	Answer
EM9101	**Environmental Quality**	**Q4(a)**	784,020
		Q5(a)	3.75 g N/kg manure, 16,000 kg manure/hectare
EM9106	**Environmental Impact Assessment**	**Q1(bi)**	104dBA
		Q1(bii)	Yes
		Q5(a)	72.5, Good
		Q5(bi)	34,592.45 and 23,084.5
		Q5(bii)	864.811 and 577.088
		Q5(biii)	-11508.95
		Q5(c)	0.32
EM9107	**Environmental Health and Safety Management**	**Q3(ai)**	86.3 dBA, 87dBA, 90dBA
		Q3(aii)	89.8 dBA
		Q5(c)	626.09mg/L

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Code	Course Title	Question	Answer
MT0001	Shipping and the Environment	No Numerical Answer	
MT0002	Professional in Society	Q1(a)	(i)
		Q1(b)	(iii)
		Q1(c)	(iv)
		Q1(d)	(i)
		Q1(e)	(ii)
		Q1(f)	(i)
		Q1(g)	(iv)
		Q1(h)	(ii)
		Q1(i)	(iii)
		Q1(j)	(i)
MT1004	Meteorology and Oceanography	Q1(i)	B
		Q1(ii)	B
		Q1(iii)	E
		Q1(iv)	D
		Q1(v)	E
		Q4(i)	D
		Q4(ii)	B
		Q4(iii)	B
		Q4(iv)	B
		Q4(v)	A
MT2004	Mathematicss II for MS	Q1(biv)	275 million dollars
		Q2(ai)	$p \neq 4$. $p = 4$ & $q = 2$. $p = 4$ & $q \neq 2$.
		Q3(bi)	$x_1^* = 8$ $x_2^* = x_3^* = 0$ $x_4^* = 28$ $x_5^* = 0$
MT2005	Port Economics	No Numerical Answer	
MT2006	Regulatory Framework of Shipping	No Numerical Answer	
MT3005	Quality Management in Shipping	No Numerical Answer	
MT3006	Ship Chartering	Q1(b)	$50 per metric ton
		Q1(c)	$37.27 per ton
MT4102	Distribution and Warehousing	Q1(aii)	$229,575, 38,366 units
		Q3(ai)	319.821.21kg
		Q3(aii)	3,753.49m^2
MT4103	Port Planning & Operations	Q5(a)	45

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Code	Course Title	Question	Answer
SU2001	**Urban Planning and Design**	**Q1(c)**	5
		Q3(a)	$150k
		Q3(b)	Land $10m Building contruction $50m Maintenance $1m per year
		Q3(c)	$1.65m