Numerical Answers to Exam Question

Academic Year : 2021-2022 **Semester :** 1 **Course Code :** CV1011

Course Title : Mechanics of Materials

Tabulated By : Ivan Au & Yang En-Hua

Question No	Answer
1	Ax=310N, By=663N, C=620N
2	a) 1866x10^6 mm^4; b) i) 9.5mm; ii) 0.1, 100 Mpa; iii) 0.0958
3	(a)(i) 8 deg; (a)(ii) 66.7kN; (b) 4.09MPa, 5.11MPa
4	(a) 63.4 deg; (b) -2.31 MPa, 4.04 MPa

Numerical Answers to Exam Question

Academic Year : 2021-2022 **Semester :** 1 **Course Code :** CV1012

Course Title : Fluid Mechanics

Tabulated By : Chiew Yee Meng

Question No	Answer
1ai, aii	p_{gauge} = -0.442 bar; p_B = 2452.5 Pa, h = 0
1bii	Density = 366 kg/m^3, P = 433.8 N/m
2(a)	Total depth = 1.127 m
2(b)	Pressure = 187,500 Pa, F_x = 785.4 N, F_y = 1669 N
3(c)	Q_m = 0.01 m^3/s, kinematic viscosity ratio = 31.62
3(d)	Shaft power = 38.64 kW
4(c)	Q_1 = 0.216, Q_2 = 0.211, Q_3 = 0.139, Q_4 = 0.287

Numerical Answers to Exam Question

Academic Year : 2021-2022 **Semester :** 1 **Course Code :** CV2011

Course Title : Structural Analysis I

Tabulated By : LI Bing

Question No	Answer
Q1	5,15,20,25 KN DF = -25 KN CF=-7.07 KN
Q2	80, 98 ,202 KNs M =502 KNm V =98 KN
Q3	$x_1 = 0.211L$, $v = 0.016ML^2/EI \uparrow$; $x_2 = 0.789L$, $v = 0.016ML^2/EI \downarrow$
Q4	$\Delta_B = (P_1/3+5P_2/6)L^3/EI$, $\Delta_C = (5P_1/6+8P_2/3)L^3/EI$; $\Delta_{Dh} = 2133/EA$, $A \geq 3048mm^2$

Numerical Answers to Exam Question

Academic Year : 2021-2022 **Semester :** 1 **Course Code :** CV2013

Course Title : Engineering Geology and Soil Mechanics

Tabulated By : Wu Wei / Teh Cee Ing

Soil Mechanics

Q1	Answers
(a)	q=kia
(b)	1.82 m
(c)	1.1m, 11 kPa
(d)	0.36, 3.6
(e)	2 cm/min

Q2	Answers
(a)	30%
(b)	0.49
(c)	6.7 cm
(d)	6.1 yr
(e)	183 kPa, 6.1 m

Q3	Answers
(a)	q=kia
(b)	pressure head = 1.818 m
(c)	height of water, hw = 1.118 m
	pore pressure u = 10.97 kPa
(d)	hydraulic gradient in soil 1 = 0.364
	hydraulic gradient in soil 2 = 3.64
(e)	discharge velocity v = 2 cm/min

Q4	Answers
(a)	water content = 30%
(b)	final void ratio = 0.485
(c)	final settlement = 6.7 cm
(d)	time for 90% average degree of consolidaiton = 6.09 years
(e)	Effective stress = 183 kPa
	height of water in standpipe = 6.12 m

Numerical Answers to Exam Question

Academic Year : 2021-2022 **Semester :** 1 **Course Code :** CV2015

Course Title : Hydraulics

Tabulated By : Chiew Yee Meng

Question No	Answer
2ci, ii, iii	flow depth = 2.29 m; flow depths = 1.585 m and 2.028 m
3b	y_c = 1.234 m, y_n = 2.277 m
3c	2.532 m, Distance = 3.7 m uptream
4(a)ii, iii	critical flow depth = 1.366 m, no normal flow depth.Total length = 48 m

Numerical Answers to Exam Question

Academic Year : 2021-2022 **Semester :** 1 **Course Code :** CV2020

Course Title : Water Resources Engineering

Tabulated By : Qin Xiaosheng

Question No	Answer
1a	normal depth: 1.242 m
1b	normal depth: 1.351 m
1c	n/a
1d	hump height: 0.262 m
2a	Critical depths: 0.556 (A-B), 0.556 (B-C), 0.883 (C-D), 1.254 (D-E), 1.254 (E-F)
2b, 2c	n/a
3a	192 mm/hr
3b	total runoff depth: 15 mm, phi-index=40 mm/hr
3c	Q=134 m3/s, V=2.63 m/s
4a(i)	Direct runoff: 0, 2, 15, 49, 50, 105, 45, 30, 10, 0 from hr 0 to 9.
4a(ii)	36.72 km2
4b	outflow: 10, 15, 30, 60, 70, 40, 15 at time hr from 0 to 6.
4c	n/a

Numerical Answers to Exam Question

Academic Year : 2021-2022 **Semester :** 1 **Course Code :** CV3011

Course Title : R C Design

Tabulated By : Li Bing/Qian Shunzhi

Question No	Answer
Q1	545 KNM; 2898 mm2; 319.5 KN; 267 KN ; 0.554
Q2	238 KN/m
Q3	(a) As =3024 mm2
	(b) M = 393 kNm
Q4	(a) As Ly > Lx > a, hence Ly-Lx > 0, and LxLy > LxLx > a2 Hence 1/8 [(Ly-Lx) (Lx Ly- a2]] > 0
	(b) VRd,c = 3174 kN > VEd = 764 kN

Numerical Answers to Exam Question

Academic Year : 2021-2022 **Semester :** 1 **Course Code :** CV3013

Course Title : Foundation Engineering

Tabulated By : EC Leong

Question No	Answer
1	(c) 8.9% (d) 33.5%
2	(a) Rd = 68.5 kN/m, Qd = 26.2 kN/m; Rd = 36.1 kN/m, Qd = 21.3 kN/m (b) 0.698 m
3	(a) 368.7 kN (d) 1250 kN
4	(a)(i) H = 7.55 m, (ii) ODF = 2.37 (b) 359.28 kN

Numerical Answers to Exam Question

Academic Year : 2021-2022 **Semester :** 1 **Course Code :** CV3014

Course Title : Transport Engineering

Tabulated By : Zhu Feng

Question No	Answer
Q1	(d) 60, 1800, 60
Q2	(a) 420m (b) 6.3m
Q3	(a) 8, 4,4 (b)9,3,5 (c)2.5,5.5,9.5
Q4	(b) 446.5m^3, 608.0m^3
Q5	-
Q6	40mm, 90mm, 150mm

Numerical Answers to Exam Question

Academic Year : 2021-2022 **Semester :** 1 **Course Code :** CV3015

Course Title : Environmental Engineering

Tabulated By : Chong Tzyy Haur

Question No	Answer
Q1a	1.5 mg/L
Q1b	100 mg/L; 52.29 mg/L; 130.66 mg/L
Q1c	90%
Q2a	3.58 m; 2.45 m
Q2b	40%, 10%
Q3a	0.1 m
Q3b	NIL
Q3c	NIL
Q3d	NIL
Q3e	NIL
Q4a	NIL
Q4b	0.51 g VSS/g BOD; 0.57 g VSS/ g COD
Q4c	NIL
Q4d	120 mL/g

Numerical Answers to Exam Question

Academic Year : 2021-2022 **Semester :** 1 **Course Code :** CV4011

Course Title : Project Planning and Management

Tabulated By : Teoh BK

Question No	Answer
Q1	NIL
Q2(a)	60 weeks
Q2(b)	55 or 56 weeks
Q2(c)	NIL
Q2(d)	14500 man-day
Q3(a)	93 days
Q3(b-i)	119 days
Q3(b-ii)	100 days
Q4(a)	Project cost $214920; Project Value: $245792
Q4(b)	Week 16; $24776

Numerical Answers to Exam Question

Academic Year : 2021-2022 **Semester :** 1 **Course Code :** CV4101

Course Title : Structural Analysis III

Tabulated By : Zhao Zhiye

Question No	Answer
Q1	(a) DOFs = 2 (b) u4 = 0.0025 m, v4=-0.0035 m (c) P = 200 kN
Q2	(a) (i) DOFs = 2 (ii) theta2 = 0.0225 rad, v3=0.105 m
Q3	(a) rho(cr) = 1.2257 (b) rho(cr) =0.6518
Q4	(a) lower & upper bounds [pi^2*EI/(4L^2), pi^2*EI/(L^2)] (b) Pcr = 0.7748*pi^2*EI/(L^2)

Numerical Answers to Exam Question

Academic Year : 2021-2022 **Semester :** 1 **Course Code :** CV4110

Course Title : Excavation and Retaining Walls

Tabulated By : Yi Yaolin & Anthony Goh

Question No	Answer
1a	1.5
1c	2.41
1e	1.67
2(c) (i)	1.27
2(c) (ii)	101.5 kN
2(c) (iii)	23.9 kNm/m
3b	175.5 kN, 312 kN, 312 kN, 15.6 kNm/m
4a (i)	2.31
4a (ii)	3.64
4b	1.83

Numerical Answers to Exam Question

Academic Year : 2021-2022 **Semester :** 1 **Course Code :** CV4112

Course Title : Traffic Engineering

Tabulated By : Lum Kit Meng

Question No	Answer
1a	Significant reduction > 4 km/h in mean speed at 10% significance level Lower bound = 4.49
2a	Movement Capacity, cm,7 = 143 veh/h Movement Capacity, cm,8 = 181 veh/h Movement Capacity, cm,9 = 831 veh/h Shared-lane Capacity = 231 veh/h
2b	Delay, d = 103.8 s (LOS F)
3	Cycle time = 165 s GA = 40 s, GB = 34 s, GC = 43 s, and GD = 32 s
4a	V = 5,804 veh/h
4b	V = 7,605 veh/h
5a	Speed of clearing wave = -26.67 km/h
5b	Waves intersect 10 km upstream at approximately 11:23 am.
6a	Queue is cleared at t=80 mins

Numerical Answers to Exam Question

Academic Year : 2021-2022 **Semester :** 1 **Course Code :** CV4116

Course Title : Coastal Engineering

Tabulated By : Edmond Lo

Question No	Answer
Q1a	(21, 0.455, 0.579, 0.659, 0.824, 0.94)
Q1b	(7, 3.0)
Q1c	(7.03, 2.34)
Q2a	(-109 to -59)
Q2b	(0.82)
Q3a	0.696m
Q3b	0.76m from North
Q3c	1.16m, 1280N
Q4a	(i) 1.52m; (ii) 210kg; (iii) 5.9m; (iv) 83kg
Q4b	1,170yr

Numerical Answers to Exam Question

Academic Year : 2021-2022 **Semester :** 1 **Course Code :** EM9104

Course Title : Air Quality Management

Tabulated By : Wang Rong

Question No	Answer
2(b) (iii)	C_2 = 0.6 g/m^3; η_1 = 83.3%
4(e)	y(benzene)+ y(toluene) = 7%
5(b)	CaO required = 9.974 x 10^6 kg/hr; Total annual cost = $ 4.98 x 10^9
5(c) (i)	C_i = 17891.35 μg/m^3

Numerical Answers to Exam Question

Academic Year : 2021-2022 **Semester :** 1 **Course Code :** EM9105

Course Title : Energy Resources Management

Tabulated By : Lim Tuti Mariana

Question No	Answer
1(b) (i)	727.58 EJ/yr
1(b) (ii)	58.62 years
5(a) (i)	5.18x106 MT/yr
5(a) (ii)	170 MT/yr
5(b) (i)	1.075 x 109 W
5(b)(ii)	329.57 m3/s
5(b)(iii)	4.71x106 MWh

Numerical Answers to Exam Question

Academic Year : 2021-2022 **Semester :** 1 **Course Code :** EN1001

Course Title : Environmental Chemistry

Tabulated By : Grzegorz Lisak

Question No	Answer
Q1(a)	Cation = 3.71 meq/L; Anion = 3.71 meq/L
Q1(b)	151 mg/L as CaCO3
Q(c)	Total Alk (A) = 136 mg/L as CaCO3; Total Alk(B) = 386 mg/L as CaCO3
Q2(b)	Fe(III) = 2.8 x 10^-12 mg/L at pH 7, pH > 3.68 Fe(III); pH > 9.98 (Fe(II)
Q2(C)	1840 kg/d
Q3(b)	14 days

Numerical Answers to Exam Question

Academic Year : 2021-2022 **Semester :** 1 **Course Code :** EN2004

Course Title : GEO-ENVIRONMENT AND SOIL MECHANICS

Tabulated By : Xunchang Fei

Question No	Answer
1	N.A.
2	a) 3.08 g DO/g benzene; b) 379 g > 0.8 g; c) 6.3 kg benzene/d
3	a) 1447 d; b) 5.2 m3/30 d; c) 54 kg; d) N.A.; e) N.A.
4	a) q=kia; b) 1.82 m; c) 1.1m, 11 kPa; d) 0.36, 3.6; e) 2 cm/min
5	a) 30%; b) 0.49; c) 6.7 cm; d) 6.1 yr; e) 183 kPa, 6.1 m

Numerical Answers to Exam Question

Academic Year : 2021-2022 **Semester :** 1 **Course Code :** EN3001

Course Title : Solid and Hazardous Waste Management

Tabulated By : Darren Sun

Question No	Answer
1	
2(a)	Carbohydrate =25.5 kg; Lipid = 5.4 kg
2(C)	24 kg
3(b)	O2 = 7.2x10^6 m3; air = 34.3 x 10^6 m3
3(C)	Heat = 114.4 x 10^9 kj/d
3(d)	V=84.7 x 10^6 m3
4(a)	Ni = 0.065%; Pb = 0.095%; Cu = 0.08%
4(C)	Ni = 148 years; Pb = 371 years; Cu = 21 years
5(a)	Ash = 33,780 kg/d
5(b)	7.79 kg/d

Numerical Answers to Exam Question

Academic Year : 2021-2022 **Semester :** 1 **Course Code :** EN3002

Course Title : Wastewater Engineering

Tabulated By : Zhou Yan

Question No	Answer
1(a)	1.8g/L; 1.35g/L; 0.052g/L; 0.065g/L; 1.735g/L
1(b)	270mg/L; 390.8mg/L
1(c)	78.5mg/L; 98.1%
2(a)	0.53gCaCO3/g coagulant; 0.38 g Fe(OH)3/g coagulant
2(b)	Re=4.29
3(c)	155 mL/g
3(d)	19.4d; 0.625 gBOD/g MLVSS.d; 0.077
4(b)	7.1h; 1.52 kgCOD/m3.d
4(c)	4405 mg/L

Numerical Answers to Exam Question

Academic Year : 2021-2022 **Semester :** 1 **Course Code :** EN3003

Course Title : Environmental Transport Processes

Tabulated By : She Qianhong

Question No	Answer
1(a)	2.35×10^(-9) m^2/s
1(b)	8.865×10^(-6) m^2/s
1(c), (i)	3.6×10^4 s; 1.591×10^(-5) kg/m^3
1(c), (ii)	0.7989 m
1(c), (iii)	1.578×10^(-5) kg/m^3
1(d), (i)	4.842×10^(-5) kg/m^3
1(d), (ii)	1.520×10^(-12) kg/s
2(a)	0.693 /d
2(d), (i)	20.9 mg/L; 5.64 mg/L
2(d), (ii)	1.495 mg/L; 17.71 mg/L
2(d), (iii)	0; 8164 m
2(d), (iv)	15.37 mg/L;
3(a), (i)	7.62 atm-L/mol; 0.317
3(a), (ii)	6.73 x 10⍰6 m3/g; 10.1
3(a), (iii)	FSolid = 0.262; Fw = 0.483; Fa = 0.255
4(a)	7.9 kg/m3
4(b)	1.58 kg/m3
4(c)	0.20 m/s
4(d)	360 m
4(e)	1.58 x 10^(-5) m/s

4(f)	1.88 x 10^(-5) s^(-1)
4(g)	100,000 s = 27.8 h = 1.157 day; 0.98 kg/m3

Numerical Answers to Exam Question

Academic Year : 2021-2022 **Semester :** 1 **Course Code :** EN4105

Course Title : Integrated Environmental Management

Tabulated By : Fang Mingliang

Question No	Answer
1	(a) 1400 mm/year (b) 0.8 million m3/day (c) NA
2	na
3	(C) 108,040 t/year
4	na
5	(a) 4.91 x 10-4, (b) 0.143 ug/L, (C) na
6	(1) 93, 51, 30 (2) 9450 (3) 1158 kg

Numerical Answers to Exam Question

Academic Year : 2021-2022 **Semester :** 1 **Course Code :** MT1001

Course Title : Maritime Mathematics I

Tabulated By : Adrian Law Wing-Keung

Question No	Answer
1a	1000
1b	1.792
1c	2.888
1d	1.5
2a	1400, 1066
2b	7679
3c	1.9315
4c	0.1417

Numerical Answers to Exam Question

Academic Year : 2021-2022 **Semester :** 1 **Course Code :** MT4001

Course Title : Shipping Logistics

Tabulated By : TEO CHEE CHONG

Question No	Answer
4(a)(i)	361 and 180.5
4(a)(ii)	150
4(b)	Q= 4,701 and $142,076.95

Numerical Answers to Exam Question

Academic Year : 2021-2022 **Semester :** 1 **Course Code :** MT4101

Course Title : Intermodal Transpirtation

Tabulated By : TEO CHEE CHONG

Question No	Answer
3(a)(i)	1,171 TEUs per day
3(a)(ii)	12.17 knots
3(b)(i)	878 TEUs per day