

APPENDIX A

SOLUTIONS TO MULTIPLE CHOICE QUESTIONS

CHAPTER 1

Problem No.	Brief Explanation	Correct Answer			
		A	B	C	D
1.1	When two earth plates moves apart from each other, the earth movements creates a ridge	☐	☐	☐	☒
1.2	When a hanging wall moves up a footing wall during an earthquake, the movement is known as normal fault	☐	☐	☒	☐
1.3	Earthquake origination on the earth surface is known as the epicenter.	☐	☒	☐	☐
1.4	A plate moving underneath another plate is known as subduction	☒	☐	☐	☐
1.5	California San Andreas fault is right lateral strike slip movement	☒	☐	☐	☐
1.6	P-waves displace materials just ahead or behind their line (direction) of propagation. S-waves displace materials vertically and horizontally.	☐	☐	☒	☐
1.7	When a seismic sea wave (Tsunami) approaches sea shore, the wave velocity decreases and the height increases	☐	☐	☐	☒
1.8	Shear waves causes more damages than Primary waves to structures	☐	☐	☒	☐
1.9	Tsunami can be best described as seismic sea waves	☐	☒	☐	☐
1.10	Seismic waves are generated by sudden snap of rock formation within earth crust	☐	☐	☒	☐

CHAPTER 2

Problem No.	Brief Explanation	Correct Answer			
		A	B	C	D
2.1	Hazard level is defined using earthquake probability of exceedance	☒	☐	☐	☐
2.2	Earthquake magnitude is determined from the logarithm of recorded amplitude	☐	☒	☐	☐
2.3	The Modified Mercalli scale is commonly used to determine earthquake intensity	☐	☐	☒	☐
2.4	Modified Mercalli Scale has 12 categories for earthquake intensity	☐	☐	☐	☒
2.5	Attenuation of ground motions indicates a decrease in seismic energy far from the earthquake epicenter	☐	☒	☐	☐
2.6	A seismometer is used to measure earthquake displacement amplitude with time	☐	☐	☐	☒
2.7	Attenuation of ground motions is not influenced by earthquake magnitude	☒	☐	☐	☐
2.8	An increase in earthquake magnitude by one whole number represents 10 fold increases in vibration amplitude. Two whole number increase yields 100 fold increases	☐	☐	☒	☐
2.9	An increase in earthquake magnitude by one whole number represents 32 fold increases in energy release. Two whole number increase yields approximately 1000 fold increases	☐	☐	☐	☒
2.10	Soil liquefaction is best described as an increase in pore water pressure causing severe drop/loss of shear strength of soil	☒	☐	☐	☐
2.11	Soil liquefaction occurs when soil formation are composed of saturated loose sand	☐	☒	☐	☐
2.12	Vulnerability of welded steel frame buildings was one of the most notable lessons learned from Northridge Earthquake 1994	☒	☐	☐	☐
2.13	Ground motions are greatly amplified when passing through geologic formation mostly composed of soft soil (soft clay or bay mud)	☐	☐	☒	☐
2.14	Field Act assigned responsibility for approving design of public schools to Division of State Architecture	☐	☒	☐	☐
2.15	From TABLE 2.1, MM scale IX indicates considerable damage to structures from earthquake event	☐	☒	☐	☐
2.16	Resonance amplifies the vibration amplitude when any of the earthquake period/frequency, site (soil) period/frequency, and building period/frequency coincide with any or each other periods/frequencies. All of the above	☐	☐	☐	☒
2.17	Hazard level 3%, n = 75 years $Pe = 1 - (1 - Pa)^n = 1 - (1 - 1/Tr)^n$ $0.03 = 1 - (1 - 1/Tr)^{75}$ $(0.97)^{1/75} = 1 - 1/Tr$ $0.9995939 = 1 - 1/Tr$ $0.000406 = 1/Tr$ $Tr = 2463 \text{ years} = 2500 \text{ year}$	☐	☐	☐	☒

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| 2.18 | Longer duration of ground shaking is likely to increase the damage to structures during earthquake. Larger attenuation and distance to epicenter is likely to reduce the damage. S waves (secondary) not P waves (primary) is the cause of damage to structures | <div style="border: 1px solid black; padding: 2px; display: inline-block;">☒ ☐ ☐ ☐</div> |
| 2.19 | Raleigh waves has a relatively large predominate earthquake period that coincide with the natural period of a tall high-rise building | <div style="border: 1px solid black; padding: 2px; display: inline-block;">☐ ☐ ☒ ☐</div> |
| 2.20 | large duration of ground shaking, liquefaction potential, poor seismic detailing are more likely to cause severe damage. Less likely with small PGA, large distance to epicenter and new construction | <div style="border: 1px solid black; padding: 2px; display: inline-block;">☐ ☐ ☐ ☒</div> |
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