Points: 2

1. What are the three main components of the substructure?



* 1. \*Abutments, piers and bents, wingwalls
  2. Abutments, piers and piles, wingwalls
  3. Abutments, piers and bents, retaining walls

Points: 2

1. What is the best description of an extended pile pier?
   1. Piles are welded together to allow for deeper pile penetration
   2. Piles are extended into an integral concrete cap
   3. \*Piles are extended above ground and become a part of the pier shaft.

Points: 2

1. How can you tell if the abutments or piers are on spread footings or on piles when the underside of the footings aren’t visible?
   1. \*Check the drawings
   2. Check horizontal alignment for settlement
   3. Check vertical alignment at end of abutment or pier

Points: 2

1. What other component is typically inspected at the same time wing walls are inspected?
   1. \*Abutments
   2. Piers
   3. Piles

Points: 2

1. What type of span is shown in the foreground in the picture below?



* 1. \*Rigid frame
  2. Pinned footing
  3. Rigid arch

Points: 2

1. At what temperature should bearings be in the neutral position?
   1. 0 degrees celsius
   2. 5 degrees celcius
   3. 10 degrees celcius
   4. \*15 degrees celcius
   5. 20 degrees celcius

Points: 2

1. What should bearings and bearing areas be kept free of?
   1. Movable components
   2. \*Accumulations of dirt and debris
   3. Substructure movement

Points: 2

1. Polytetrafluoroethylene (PTTE) is a plastic-like polymer material often found on which type of bearing?
   1. Steel plate bearings
   2. \*Elastomeric bearings
   3. Roller bearings
   4. Rocker bearings

Points: 2

1. What type of bearing is shown in the picture below?



* 1. \*Laminated elastomeric bearing
  2. Steel shim bearing
  3. Pot bearing

Points: 2

1. What determines the carrying capacity of a log stringer?
   1. Log stringer length and spacing
   2. Log stringer piers species type
   3. \*Log stringer length and diameter

Points: 2

1. What primary defect do you see in the bearing in the picture below?



* 1. The pin is too tight, doesn’t allow for movement
  2. \*The keeper bar that holds the rollers in alignment is missing
  3. There is corrosion on the roller bearings.

Points: 2

1. What is the main purpose of needle beams?
   1. \* Needle beams distribute the load evenly to all the logs in the span
   2. Needle beams prevent debris from impacting the bridge proper
   3. Needle beams add weight to the bridge thus reducing load capacity

Points: 2

1. How would you monitor horizontal crack growth in glulam beams?
   1. Core the beam to see how deep the crack is
   2. \* Mark and date the ends of the cracks
   3. Inject the crack with sealant

Points: 2

1. Which chord is in tension on a timber truss?
   1. Top chord
   2. \*Bottom chord
   3. Neither, they are both in compression
2. Tension rods in a timber truss are all the same diameter.
   1. True
   2. \*False

Points: 2

1. Why are the portal braces so important?
   1. \*They square the end of the bridge
   2. They act as a fender to lessen impact damage
   3. They are used as a tell tale to see if a vehicle is over height for the bridge
2. Concrete I-Beams are usually erected as simple spans but they can also be made continuous.
   1. \*True
   2. False

Points: 2

1. In a rigid frame concrete structure what component are the legs rated under?
   1. Abutments
   2. Piles
   3. \*Piers

Points: 2

1. What area may be subject to fatigue cracking on welded simple span steel beams?.
   1. Bearing area where it is in contact with the bottom flange
   2. \*Cover plates welded to the bottom flanges
   3. Bracing connections welded to the bottom flange
2. A pony girder or half through girder bridge has the deck placed between the girders with the tops of the girders visible to the motorist as they drive across.
   1. \*True
   2. False
3. Steel box girders are often used for curved bridges.
4. \*True
5. False
6. A tied arch has a horizontal compression tie member which connects the bottom ends of each arch rib together, like the string on an archer’s bow.
7. True
8. \*False

Points: 2

1. What is the name of the 2 modular bridge types below?



* 1. Single single and single single reinforced
  2. Double single and double single reinforced
  3. \*Triple single and triple single reinforced

1. Timber deck planks should be placed heart side down.
2. \*True
3. False

Points: 2

1. What area on a timber rail system is primarily susceptible to decay?
   1. \*Horizontal surfaces such as the wheelguards
   2. Ends or hand rail
   3. Post locations

Points: 2

1. How can you tell if there are areas of delamination on a concrete deck?
   1. Watch for concrete movement under heavy loads
   2. \*Chain drag the deck and listen for a hollow sound
   3. Delaminated areas are spotted as shallow potholes

Points: 2

1. What is the best method for testing the approaches to determine the rating?
   1. Drive across the bridge, from each direction, above the posted speed
   2. \*Drive across the bridge, from each direction, at the posted speed
   3. Lay flat on stomach about 10m from bridge and eyeball approach

Points: 2

1. Why do bridges have deck joints?
   1. They assist in keeping the bridge superstructure in line when heavy loads cross
   2. They prevent passage of water and winter salts from damaging substructure elements
   3. \*They allow for expansion and contraction and rotation of the bridge superstructure

Points: 2

1. What are two types of unsealed expansion joints?
   1. Finger joints and compression seal
   2. Finger joints and transflex seal
   3. \*Floor plate joints and finger joints
2. Modular Elastomeric joints are limited to maximum 100mm of total movement.
3. True
4. \*False

Points: 2

1. What is the primary problem that may occur from clogged deck drains?
   1. Clogged deck drains may cause standing water to obscure lane lines
   2. \*Clogged deck drains may cause puddles of standing water to form, creating a safety hazard
   3. Clogged deck drains cause water to flow to the joint areas possibly contaminating the substructure