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Final Exam
Continuing Education Course #128
Fundamentals of Steel
Part B

1. The structural behavior of a connection is often so complex that it is nearly impossible to describe it by a formula.
- a. True
- b. False

2. Common connection mechanisms for structural steel are:
- a. Welds
- b. Bolts
- c. Rivets
- d. All of the above

3. Riveted connections are not used much in the United States today because.
- a. Rivet steel is hard to get
- b. Rivets are too weak
- c. High strength bolts are much cheaper to buy
- d. The labor is too expensive to install rivets
- e. None of the above

4. In a weld, which of the following is NOT true?
- a. The base metal is usually stronger than the cooled combination of metals
- b. The added weld material is usually stronger than the base metal
- c. The cooled combination of metals is usually stronger than the base metal
- d. Either AC or DC can be used to create the arc

5. In shielded arc welding
- a. The electrode has a coating
- b. The electrode is a bare wire
- c. Flux is used to shield the weld from the atmosphere
- d. Slag is usually self cleaning

6. Submerged arc welding
- a. Is automatic
- b. Uses a bare wire electrode
- c. Is hidden from view by a mound of flux
- d. All of the above

7. The two basic weld types are.
- a. Square and butt
- b. Corner and edge

○ c. Horizontal and vertical
○ d. Butt and fillet

8. The stress transfer in a butt weld is usually in the form of shear stress.
○ a. True
○ b. False

9. Intermittent welds are fairly common in butt welds.
○ a. True
○ b. False

10. What is the area of the throat of a weld on an 8” long by 5/8” fillet weld?
○ a. 0.39 in^2
○ b. 1.56 in^2
○ c. 3.125 in^2
○ d. 3.54 in^2

11. What is the allowable load on a fillet weld that has a throat area of 2.6 in^2 if the allowable stress on the weld is 24,000 psi?
○ a. 9.2 kips
○ b. 44.1 kips
○ c. 62.4 kips
○ d. 88.3 kips

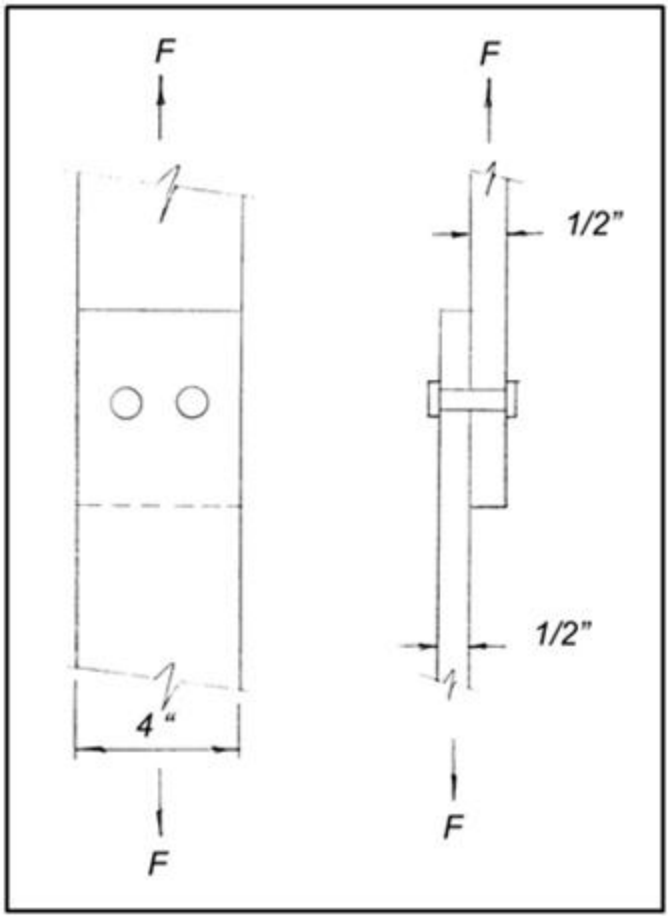
12. The mathematical behavior of bolted connections is a relatively simple matter.
○ a. True
○ b. False

13. A ½” diameter bolt in a normal bolted connection would probably be inserted into a hole with a diameter of.
○ a. 7/16 inch
○ b. 1/2 inch
○ c. 9/16 inch
○ d. 5/8 inch

14. Bolted connections usually rely on friction to carry the majority of the load.
○ a. True
○ b. False

15. A common bolt for use in a bolted connection is.
○ a. ASTM A36
○ b. ASTM A325
○ c. ASTM A492
○ d. ASTM A 992

Questions 16, 17, and 18 refer to the following bolted connection.



For Questions 16, 17, and 18, use the following plate and bolt properties:
Bolt size: 3/4" diameter
Bolt hole size: 3/4" + 1/16"
Allowable single shear load: 14 kips per bolt
Plates size: 4" wide by 1/2" thick
Plate allowable bearing stress: 70 ksi
Plate allowable tensile stress: 22 ksi

16. What is the capacity of the bolted joint considering only plate bearing failure?
- ○ a. 26.3 kips
- ○ b. 28.4 kips
- ○ c. 52.5 kips
- ○ d. 56.9 kips

17. What is the capacity of the bolted joint considering only tensile failure of the plate?
- ○ a. 26.1 kips
- ○ b. 27.5 kips
- ○ c. 35.1 kips
- ○ d. 35.8 kips

18. What is the capacity of the bolted joint considering only bolt shear?
- ○ a. 14 kips
- ○ b. 16.5 kips
- ○ c. 28 kips
- ○ d. 52.5 kips

19. Unbuttoning is the term used for removing bolts from a bolted joint.
- a. True
- b. False

20. Steel bar joists are always made of steel.
- a. True
- b. False

21. All steel bar joist manufacturers must adhere to the specification.
- a. Code of Standard Practice for Steel Buildings and Bridges
- b. Manual of Steel Construction
- c. Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings
- d. Standard Specification for General Requirements for Rolled Steel Plates, Shapes, Sheet Piling, and Bars for Structural Use

22. Wood can be stronger in a fire than steel.
- a. True
- b. False

23. Instability of a compression member can take the form of.
- a. Vertical buckling of the compression flange
- b. Lateral buckling of the compression flange
- c. Buckling of a column
- d. All of the above

24. Concrete and masonry around a steel column can be used for protection against fire and physical damage.
- a. True
- b. False

25. The steel of the Mackinac Bridge in Michigan is protected against the weather by paint.
- a. True
- b. False