I. MACHINERY AND EQUIPMENT SYSTEMS: Round balers

1. When setting up the tractor to attach the John Deere 556 round baler, the tractor drawbar must be _____ inches from the ground.
   a. 6-12
   b. 13-20
   c. 24
   d. 540

2. This symbol, found in the Operator’s Manual, is a __________ safety symbol.
   a. stay clear of rotating drivelines
   b. rotating PTO shaft
   c. machine in motion
   d. driveshaft rotates clockwise

3. The maximum bale weight for the JD 556 Round Baler is _____ pounds in dry hay.
   a. 900
   b. 4310
   c. 1450
   d. 1750

4. Minimum horsepower requirement for a tractor, pulling the JD 556 Round Baler, is _____ HP.
   a. 35
   b. 45
   c. 55
   d. 100

5. If a large round bale starts to roll downhill, you should:
   a. call 911
   b. try to stop the bale with the rear tractor wheel
   c. stay clear, until the bale stops rolling
   d. turn the bale with the loader

6. __________ is the best tractor to use to transport large round bales.
   a. 2010 John Deere
   b. New Holland “Boomer”
   c. 4450 John Deere
   d. CA Allis-Chalmers
7. The windrow should be ________ in order to make an ideal shaped large round bale.
   a. twice as wide as the baler pickup  
   b. nearly the same width as the baler pickup  
   c. one-half the width of the baler pickup  
   d. one-third the width of the baler pickup

8. This is the safety symbol for:
   a. recognize safety information  
   b. engage gate lock  
   c. protect bystanders before unloading bale  
   d. understand signal words

9. If the windrow is not full-width of the baler pickup, the operator can ________ to make a uniform bale.
   a. drive faster  
   b. drive slower  
   c. keep the windrow centered  
   d. “weave” the baler back and forth across the windrow

10. You should do all of the following, except _____ when you see this symbol in the operator’s manual or on the machine.
    a. be alert to the potential for personal injury  
    b. follow safety instructions  
    c. you can ignore this warning  
    d. be alert to dangers where you see this sign on the machine

11. You should _____ if your little brother wants to ride on the tractor when you are going to operate the large round baler.
    a. make sure that he is at a safe distance from the baler  
    b. let him ride, if he is over 10 years old  
    c. make sure that he holds on tight  
    d. let him ride, if he sits in your lap

12. Large round balers can be operated safely on a moderately sloping field. Do all of the following, except _____ when you are operating the baler in this field.
    a. make sure you are headed up-hill when you discharge the bale  
    b. drive at a safe speed on moderate slopes  
    c. discharge bales crossways on slopes, so that the bales do not role down-hill  
    d. stay away from ditch banks or gullies
II. INDUSTRY AND MARKETING SYSTEMS: Hydraulics

13. Fluid power includes _____ and _____.
   a. solids and liquids
   b. liquids and gases
   c. solids and gases
   d. none of the above

14. Flow through an orifice causes a(an) __________ in pressure.
   a. decrease
   b. increase
   c. no change
   d. flow

15. Hydraulics provide __________ __________ in work force.
   a. great increases
   b. great decreases
   c. increased pressure (PSI)
   d. no change

16. Hydraulic pressure and velocity vary __________.
   a. directly
   b. smoothly
   c. inversely
   d. continuously

17. The PSI is _____ at the base end of a hydraulic cylinder compared to the PSI at the rod end.
   a. less
   b. more
   c. equal
   d. none of the above

18. The force is _____ at the base end of a hydraulic cylinder compared to the force at the rod end.
   a. less
   b. more
   c. equal
   d. none of the above

19. The lifting force required to lift a particular field finisher is 17,500 pounds. A _______ diameter cylinder would be the smallest sized cylinder that could lift the machine if the tractor hydraulic system developed 2200 PSI.
   a. 3 inch
   b. 3.5 inch
   c. 4 inch
   d. 5 inch
20. Most farm hydraulic cylinders have all of the following specifications, except:
   a. single acting
   b. double acting
   c. standard pressure
   d. chromed piston rod

21. A hydraulic ram, as found on some 3-point lift cylinders and some high-pressure applications, have a:
   a. cylinder bore diameter larger than the piston rod
   b. cylinder bore diameter and rod diameter that are the same
   c. cylinder bore diameter smaller than the rod diameter
   d. none of the above

22. _____ would not be a good choice for oil to add to a tractor hydraulic system.
   a. John Deere Hy-Gard
   b. Case-IH Hy-Tran
   c. Cenex TCH
   d. Chevron 5W30 motor oil

23. If you are checking for a pin-hole sized leak in a remote cylinder hose, you should do all of the following, except:
   a. replace all of the hoses on the equipment
   b. use a large piece of paper, held the opposite end and moved along the hose to locate the leak
   c. when there is NO pressure on the hose, you can feel of the hose to find the wet, oily spot
   d. observe the hose from a safe distance, when it is under pressure, to look for the leak

24. In this diagram, the control valve is shown in the _______ position.
   a. Raise
   b. lower
   c. neutral
   d. none of the above

25. This electric motor, using the data plate shown, has ____ horsepower.
   a. 40 c
   b. 116
   c. 1 ¼
   d. 1

26. This is a _____ phase electric motor.
   a. 1 ¼
   b. 1.25
   c. 60
   d. 1
27. The electric motor data plate indicates that this motor operates on _____ hertz.
   a. 60
   b. 120/240
   c. 1725
   d. 116

28. This electric motor can draw up to _____ amps when operated at full load.
   a. 120/240
   b. 60
   c. 7.5
   d. 1725

29. In wiring an AC electric motor, _____ is the correct designation of the wire colors in the line wiring.
   a. black-power, white-neutral, bare-ground
   b. black-neutral, white-power, bare-ground
   c. black-ground, white-power, bare-ground
   d. black-power, white-ground, bare-neutral

30. To reverse a single voltage, reversible, AC electric motor, you would _____ wires.
   a. switch #5 (black) and #1 (blue)
   b. switch #5 (black) and #8 (red)
   c. switch #1 (blue) and #5 (black)
   d. connect #5 (black) and #1 (blue)

31. A limit switch, used to stop an electric motor driven grain auger, when the bin is full, would use a _____ switch.
   a. NC
   b. NO
   c. either of the above
   d. none of the above

32. If you are wiring an exhaust fan for Farmers Coop, in a grain storage building, you should select a(n) _____ switch.
   a. ordinary light
   b. rotary light dimmer
   c. knife
   d. explosion-proof

33. A fractional electric motor has _____ horsepower.
   a. 1.25
   b. 0.75
   c. 2.50
   d. 12
34. A _____ type electric motor, used on an air compressor, will reach constant speed very quickly.
   a. capacitor start
   b. split-phase
   c. dual-voltage
   d. open frame

35. Starting current may be _____ the running current required in an electric motor.
   a. the same as
   b. one hundred times
   c. six times
   d. one-half

36. The “can” looking object found on some electric motors, is a _____.
   a. split-phase controller
   b. little starting motor
   c. Lukenheimer flapper valve
   d. capacitor

### IV. STRUCTURAL SYSTEMS: Carpentry

37. The 2 X 4, or 2 X 6 placed on the top of a stud wall, is called a:
   a. stud
   b. header
   c. bottom plate
   d. top plate

38. The 2 X 6’s placed above a window opening in a wall, called:
   a. cripples
   b. headers
   c. studs
   d. sills

39. A ________ is a 2 X 4 or 2 X 6, placed horizontally between studs in a stud wall.
   a. fire stop
   b. header
   c. sill
   d. short stick

40. The __________ __________ is the outer vertical 2 X 4, or 2 X 6, in a framed window opening.
   a. trimmer stud
   b. king stud
   c. header board
   d. plate support
41. Wall studs are generally placed _____ inches on center.
   a. 12
   b. 21
   c. 16
   d. 36

42. The 2 X 12 placed at the ends of floor joists, and perpendicular to the floor joists and fastened to them is called the __________ joist.
   a. cross
   b. plate
   c. header
   d. stop

43. The __________ __________ is the part of the rafter that extends out past the stud wall.
   a. rooster tail
   b. loose end
   c. shadow panel
   d. rafter tail

44. The notch cut in the rafter which sits on the top plate is called the:
   a. bird’s beak
   b. bird’s mouth
   c. bird’s tail
   d. rafter tail

45. In a two-story house, with __________ __________, the stud wall sits on top of floor sheathing, rather than extending from the ground floor to the eaves with each stud.
   a. balloon framing
   b. anchor framing
   c. platform construction
   d. stick framing

46. Roof pitch is the measurement of a roof’s slope or incline. A roof with 4/12 pitch would have ____ inches of rise for each foot of horizontal distance from the edge of the roof towards the center.
   a. 4
   b. 12
   c. 1
   d. 2

47. The nominal size of a plank is 2 X 12. The actual size of the 2 X 12 would be:
   a. 2” X 12”
   b. 1 ¼” X 11”
   c. 1 ½” X 11 ¾”
   d. 1 ½” X 11 ¼”
48. A 6d nail is commonly referred to as a 6 penny nail. Long ago, this meant:
   a. the number of nails that could be made out of a penny
   b. the number of nails that could be bought for a penny
   c. the price of 100 hand forged nails of that size
   d. no one knows for sure

V. ENV / NATURAL RESOURCE SYSTEMS: Surveying

49. A total station has 3 components. All of the following, except _____ are parts of the total station.
   a. a theodolite or transit
   b. a Philadelphia rod
   c. an electronic distance measuring device
   d. a microprocessor

50. A _________ is read directly through the telescope of the person using the instrument.
   a. level rod
   b. hand level
   c. Tripod
   d. Double pentagon prism

51. Laser levels are precise up to _____ feet.
   a. 100
   b. 1000
   c. 250
   d. 5280

52. A Philadelphia rod is graduated in _____ of a foot.
   a. 10ths
   b. 100ths
   c. 1000ths
   d. 16ths

53. A plumb bob measures, or determines:
   a. a vertical line from the tripod to a point on the ground
   b. distance from the ground to the tripod
   c. elevation to the top of a hill
   d. distance to the closest tree

54. Surveying measures 3 different dimensions, which include:
   a. distance, soil type and elevation
   b. distance, angles and temperature of the day
   c. distance, angles and elevation
   d. distance, angles and mileage
55. A Cadastral survey has to do with determining and defining:
   a. soil type
   b. land ownership and boundaries
   c. location of a building on your farm
   d. elevation of Davidson Hall at ISU

56. A _____ _____ is a permanent point of known elevation.
   a. Back Sight (BS)
   b. Fore Sight (FS)
   c. Height of Instrument (HI)
   d. Benchmark (BM)

57. Elevation of an unknown point can be determined by subtracting the rod reading (FS) from the known:
   a. Front Sight
   b. Back Sight
   c. Height of Instrument
   d. Turning Point

58. ________ are the initials used to describe a point of unknown elevation.
   a. UKE
   b. KE
   c. UNK
   d. ULE

59. ________ ________ is a process of determining the relative elevations of various points, without being concerned with absolute elevations. You would probably use this method for laying out a drain line:
   a. Cadastral surveying
   b. differential leveling
   c. Height of Instrument (HI)
   d. differential calculus

60. The elevation above sea level of Ames, IA is _____ feet.
   a. 100
   b. 5280
   c. 955
   d. 6
# 2008 Ag Mechanics Exam Key

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