

2004 STATE FFA AGRICULTURAL MECHANICS PROBLEM SOLVING

Student Name _____ Score _____

Chapter _____ Student Number _____

Directions: Choose the correct answer and write the letter for your answer in the blank.

Use the information from this table to solve problems 1-4 below.

COMPARATIVE SPECIFICATIONS FOR CORDLESS DRILLS

Brand	Mfg. No.	Speed RPM	Volts	Max. Torque (inch/lbs.)	Weight (lbs.)	Cost
DeWalt	DW987K-2	0-400, 0-1600	18.0	450	9.9	\$389.00
Bosch	32614	0-400, 0-1200	14.4	250	4.1	\$249.00
Makita	6095DWBE	0-400, 0-100	9.6	122	3.7	\$219.95
Skil	2211-01	0-400, 0-1200	12.0	175	4.0	\$159.95

- ___ 1. What cordless drill has the MOST torque?
a. Bosch
b. DeWalt
c. Makita
d. Skil
- ___ 2. What cordless drill has the LEAST volts?
a. Bosch
b. DeWalt
c. Makita
d. Skil
- ___ 3. What cordless drill has the HIGHEST RPM?
a. Bosch
b. DeWalt
c. Makita
d. Skil
- ___ 4. The only cordless drill with over 400 in./lbs. of torque has:
a. 18.0 volts.
b. 14.4 volts.
c. The lowest cost.
d. The lowest RPM.
- ___ 5. Properly sharpened and balanced mower blades will reduce fuel use by 22%. The engine on a mower with dull blades uses 1 gallon of fuel per hour, and gasoline costs \$2.00 per gallon. How much will be saved on fuel if it takes 4 hours to mow?
a. \$.22
b. \$1.76
c. \$2.00

d. \$8.00

- ___ 6. An agricultural mechanic needs to buy a new service truck. He has two purchase options for the \$35,000.00 truck.
Plan A: Pay cash and get a 12% discount.
Plan B: Trade and get a \$3,500 allowance toward the new purchase.

Choosing Plan B will:

- a. Cost \$700.00.
 - b. Cost \$1500.00.
 - c. Save \$700.00.
 - d. Save \$7,700.00.
- ___ 7. Using the 1-2-3 rule, how many shovels of sand would be needed to mix with 30 shovels of Portland cement?
- a. 15
 - b. 30
 - c. 45
 - d. 60
- ___ 8. A farm shop owner used ten 100 watt lights, a 200 watt fan, and a 500 watt saw for eight hours a day for 20 days. At 14 cents per kilowatt, what is the total cost of the electricity used?
- a. \$0.15
 - b. \$20.00
 - c. \$38.08
 - d. \$61.38
- ___ 9. The amperage of a circuit with twelve 100 watt light bulbs in a 120 volt circuit is:
- a. 5
 - b. 10
 - c. 12
 - d. 1200
- ___ 10. If a shop is 36 feet wide and 60 feet long, how many cubic yards of concrete will it take to make a floor that is 6 inches thick?
- a. 27
 - b. 40
 - c. 72
 - d. 216
- ___ 11. How many cubic yards of concrete are needed to construct a driveway 9 feet wide, 100 feet long, and 4 inches thick?
- a. 11.11
 - b. 13.33
 - c. 15
 - d. 23

- ___ 12. How many sheets of plywood are needed to cover the four outside walls of a building that is 16 feet wide, 40 feet long, and has 8 feet high walls?
- 8
 - 28
 - 30
 - 40
- ___ 13. For the building in PROBLEM 12, how many sheets of plywood are needed for the subfloor?
- 20
 - 25
 - 32
 - 400
- ___ 14. How many 8 inch X 8 inch X 16 inch concrete blocks will it take to build a foundation 24 inches high for the building described in PROBLEM 12?
- 32
 - 80
 - 252
 - 270
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These materials are needed to construct a small building. Use the information for Problems 15, 16, and 17.

Quantity	Unit	Item	Price
50	Each	2" X 4" X 10'	\$ 3.25
4	Each	2" X 4" X 16'	\$ 5.55
11	Each	Truss	\$35.00
10	Sheets	3/4" AD Plywood	\$32.00
12	Sheets	5/8" CD Plywood	\$19.95
2	Each	Window	\$55.00
1	Each	Door	\$98.00
10	Pieces	V-Crimp Tin 12'	\$ 8.00
23	4' X 8'	Siding	\$35.00
15	Lbs.	Nails	\$.55
9	Each	Treated 4"X4"X16'	\$16.50

- ___ 15. What is the total cost of this bill of materials including 7% North Carolina sales tax?
- \$2006.32
 - \$2225.70
 - \$2348.22
 - \$2545.37
- ___ 16. Which item of building material has the highest unit cost?
- Door
 - Siding
 - Trusses
 - Window

- ___ 17. If the building is 16 feet wide and 20 feet long, what is the total cost per square foot?
- a. \$5.35
 - b. \$7.95
 - c. \$9.36
 - d. \$9.85
- ___ 18. The local tractor dealer charges \$55.00 to change the oil and filters on a tractor. John can buy the 8 quarts of oil for \$2.00 each, a fuel filter for \$12.00, the air filter for \$4.00, and the oil filter for \$11.00. How much will he save by changing the oil himself?
- a. \$10.00
 - b. \$12.00
 - c. \$15.00
 - d. \$55.00
- ___ 19. A small engine operator's manual suggests changing the oil every 50 hours of engine use. If the engine is used 8 hours per day for 5 days per week for a 10 week period, how many times should the oil be changed?
- a. 5
 - b. 8
 - c. 10
 - d. 50
- ___ 20. Using the information from PROBLEM 19, how much will the oil cost if the small engine holds one quart and oil costs \$2.00 per quart?
- a. \$10.00
 - b. \$16.00
 - c. \$20.00
 - d. \$100.00