Ag. Systems Management 374
Test 1 -

1. What are the two common valve angles?
A. 75ø and 90ø
B. 15ø and 65ø
C. 30ø and 45ø
D. 15ø and 45ø

2. Which of the following would be the best choice for measuring a bearing to see if it is out of round as the engine is being disassembled?
A. digital vernier calipers
B. micrometer
C. dial indicator
D. plastic gauge

3. What controls the end to end movement of the crankshaft?
A. oil pressure
B. flywheel
C. thrust bearing
D. timing gear and crankshaft dampener

4. When plasti-gauge is used to test main bearing clearance, the wider it squashes out:
A. The tighter the clearance.
B. The more clearance the bearing has.
C. Plasti-guage does not test clearance, only end play.
D. Can't tell unless you know which type (red, blue, or green)

5. What causes most valve problems?

_____ and _____

6. Why is valve spring tension important?

_____

7. The removal of air from a diesel fuel injection system is called?

_____

8. Which engine poppet valve is larger intake or exhaust?

_____

9. What are two methods of correcting valve guides which are worn?

A. _____

B. _____

10. What are two types of diesel injection pumps?

A. _____

B. _____

11. What determines the maximum oil pressure an engine can produce?

_____

PRACTICAL

1. The micrometer is set at what reading?

_____

2. The vernier calipers is set at what reading?

_____

3. The valve spring tester is set. What is the tension, pounds to compress, of the given
spring at this setting?

_____

4. Is this valve fit for service? Should it be used?

_____

5. What is this part?

_____

Test 2

1. The length of time both intake and exhaust valves are open at the same time is called the valve _____.

2. If the valve clearance is too tight (less than it is supposed to be) the valve will:

A. open too soon and close too late
B. open too late and close too early
C. open too soon and close too soon
D. open too late and close too late

3. How often should valves on tractors be adjusted?

_____

4. What are two methods for driving the camshaft from the crankshaft?

A. _____

B. _____

5. The cylinder that is halfway off in the firing order and in the same geometric position is called a/an _____.

6. What are two methods of increasing the compression ratio of an engine?

A. _____

B. _____

7. If the compression pressure is low on a cylinder and you squirt oil in the cylinder, then
retest and the compression pressure increases, what is the probable cause?

A. head gasket
B. intake valve
C. exhaust valve
D. rings

8. What is the compression ratio of an 8 cylinder engine that has a total displacement of 300
cubic inches and a clearance volume of 5.2 cubic inches per cylinder? (4 points)

PRACTICAL

1. What is the clearance of the cylinder #2 exhaust valve?

_____

2. What is the firing order of this engine?

_____

3. What is the compression ratio and spark plug gap for the given engine?

Compression ratio _____

Spark plug gap _____

4. What is the bore of this engine in inches?

_____

Test 3

1. An electronic one way valve that allows power to flow in one direction only is a/an:

A. resistor
B. diode
C. capacitor
D. regulator

2. Which of the following is the best test of a battery's ability to start a car on a cold day?

A. hydrometer test at 80?F
B. cell voltage test at 0?F
C. load voltage test at 80?F
D. deep cycle voltage test at -32?F

3. An ignition coil:

A. generates a high voltage from a low voltage
B. can not be tested
C. generates a low voltage from a high voltage
D. are the same in all vehicles

4. When one cylinder is not firing on an engine the:

A. hydrocarbons emitted decrease and carbon monoxide decreases
B. hydrocarbons emitted increase and carbon monoxide decreases
C. hydrocarbons emitted increase and carbon monoxide increases
D. hydrocarbons emitted decrease and carbon monoxide increases

5. The device used to transfer power from the battery directly to the starter which is controlled by the ignition switch is called the

_____.

6. What explosive gas is produced by the battery when charging or discharging?

_____

7. List 4 parts of an alternator.

A. _____

B. _____

C. _____

D. _____

8. What does CCA stand for?

C_____ C_____ A_____

9. What is the purpose of a cylinder leak test?

_____

10. What happens to ignition timing as the rpms are increased?

_____

11. List 3 parts of the primary low voltage ignition system.

A. _____

B. _____

C. _____

12. Give one reason why the new electronic ignitions are so much better than the old point
systems.

_____

13. About how many volts does it take to ignite the mixture in an engine at idle rpms? (500),
(5000), (50,000), (500,000) circle one

PRACTICAL

1. What is the primary resistance of this ignition coil?

_____ ohms

2. Is this diode trio good or bad?

_____

3. What is the hydrometer reading of this battery?

_____

4. Is this engine's secondary connection in the right firing order?

_____

5. What is the initial timing of the given engine?

_____

Test 4

1. Which of the following is the best method of comparing two different horsepower tractors
for power and efficiency?
   A. Gallons per hour
   B. Horsepower hours per gallon
   C. Acres per hour
   D. Acres per horsepower hour

2. How often is there a spark at the spark plug of a small engine like the ones worked on in
lab?
   A. Once every revolution
   B. Once every two revolutions
   C. Twice every revolution
   D. Spark may or may not occur every two revolutions depending on the governor setting

3. As rpms increase the friction horsepower of an engine
   A. decreases
   B. increases
   C. remains constant
   D. decreases in a 2 cycle, increases in a 4 cycle

4. What does having a high thermal efficiency mean?
   A. the engine is doing a good job of converting fuel to mechanical energy
   B. the engine is doing a poor job of converting fuel to energy
   C. the radiator is working well
   D. the radiator is not working well

5. Why is thermal efficiency so low on engines?

   _____

6. The device used to test armatures of starters and generators is called

   a/an _____.

7. List two ways a thermostat could fail and the engine symptom or problem if it happens.

   A. _____

   B. _____

8. Give one reason most small engines have a compression release.

   _____

9. What does the correction factor for horsepower help one do?

   _____

10. If the horsepower of an engine was low as compared to Nebraska test, what would you check on the tractor before you recommend an overhaul?

    _____

11. Because small engines on snow blowers run cold, how often should the oil be changed?

    _____

12. What recommendation (based on the horsepower test) would you make to a farmer pulling a light load that would help reduce fuel consumption?

    _____

13. A part of a piston engine that is eliminated on a Wankel engine is

    a/an _____

14. If Tractor A uses 9.4 gallons of fuel in one hour while producing 121 hp and Tractor
B uses 10.1 gallons per hour and produces 139 hp, which tractor is doing the best job?

Tractor A - Hp hr/gal _____

Tractor B - Hp hr/gal _____

Best Tractor - A or B (circle one)

15. A tractor engine has a PTO hp of 140 hp and a friction hp of 28 hp at 3000 rpm. What is
the indicated horsepower and the mechanical efficiency?

IHP _____

ME _____

Practical

1. If at 450 rpm the pressure on the dynamometer is 675psi, how much

horsepower is being produced? _____

2. What is the cylinder head torque and the intake valve clearance (include the units).

Head torque _____

valve clearance _____

3. Is the connecting rod journal on this crankshaft within the given specifications for a
model 8200 Briggs?

_____

4. The vernier calipers are set at what measurement?

_____

5. What is the clearance of the intake valve?

_____

Test 5

1. Which of the following is the best method of comparing two different horsepower tractors
for power and efficiency?

A. Gallons per hour

B. Horsepower hours per gallon
C. Acres per hour
D. Acres per horsepower hour

2. How often is there a spark at the spark plug of a small engine like the ones worked on in
lab?
A. Once every revolution
B. Once every two revolutions
C. Twice every revolution
D. Spark may or may not occur every two revolutions depending on the governor setting

3. As rpms decrease the friction horsepower of an engine
A. decreases
B. increases
C. remains constant
D. decreases in a 2 cycle, increases in a 4 cycle

4. What does having a high thermal efficiency mean?
A. the engine is doing a good job of converting fuel to mechanical energy
B. the engine is doing a poor job of converting fuel to energy
C. the radiator is working well
D. the radiator is not working well

5. An ignition coil:
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B. can not be tested
C. generates a low voltage from a high voltage
D. are the same in all vehicles

6. When one cylinder is not firing on an engine the:
A. hydrocarbons emitted decrease and carbon monoxide increases
B. hydrocarbons emitted increase and carbon monoxide increases
C. hydrocarbons emitted increase and carbon monoxide decreases
D. hydrocarbons emitted decrease and carbon monoxide decreases

7. The compression test is used to determine the mechanical condition of the engine. What is another test
that will show exactly where the loss is?
A. Cylinder leak test
B. Hydrometer test
C. Load test
D. Vacuum modulated test

8. Give one reason most small engines have a compression release.
_

9. Why is thermal efficiency so low on engines?

10. What does the correction factor for horsepower help one do?

11. If the horsepower of an engine was low as compared to Nebraska test, what would you check on the
tractor before you recommend an overhaul?

12. What recommendation (based on the horsepower test) would you make to a farmer pulling a light load
that would help reduce fuel consumption?

_____

13. If Tractor A uses 9.4 gallons of fuel in one hour while producing 121 hp and Tractor B uses 10.1 gallons
per hour and produces 139 hp, which tractor is doing the best job?

14. A tractor engine has a PTO hp of 140 hp and a friction hp of 28 hp at 3000 rpm. What is the indicated
horsepower and the mechanical efficiency?

15. About how many volts does it take to ignite the mixture in an engine at idle rpms? (500), (5000),
(50,000), (500,000) circle one

16. The device used to test armatures of starters and generators is called

a/an

17. What are two of the three adjustments made to align the steering axle of a tractor or car?

18. A part of a piston engine that is eliminated on a Wankel engine is

a/an

19. Radiator pressure caps :

A. Raise the boiling pt of coolant
B. Lower the boiling pt of coolant
C. Raise the freezing pt. of coolant
D. Lower the freezing pt. of coolant

PRACTICAL

1. If at 540 rpm the pressure on the dynamometer is 875psi, how

much horsepower is being produced?

2. What is the cylinder head torque and the intake valve clearance (include the units)For the given engine.

Head torque

valve clearance

3. Is the connecting rod journal on this crankshaft within the given specifications for a model 82000 Briggs?

4. The vernier calipers are set at what measurement?

5. What is the initial timing of the given engine?