



## Specific Competencies and Skills Tested in this Assessment:

### Safety

- Identify and test all equipment safety devices
- Demonstrate proper techniques for care and use of tools, equipment, and machinery
- Properly identify and label hazardous materials
- Identify proper handling, containment, and clean-up of hazardous materials
- Read and apply information regarding appropriate operation of small engines

### General Shop Practices

- Locate parts and equipment information using printed and electronic media
- Write a parts and labor invoice
- Calculate materials mark-up and labor time
- Demonstrate record keeping on worksheet and job ticket

### Maintenance

- Perform manufacturer's recommended service interval
- Sharpen blades, adjust levers and controls
- Inspect, test, and adjust safety-stop devices
- Inspect and service intake and exhaust system
- Inspect drive train and suspension system
- Inspect and service belts and hoses
- Inspect and service cooling system
- Identify types, uses, and recommended service of power transmission



### Lubrication Systems

- Inspect oil level and condition
- Service lubrication system
- Identify types of lubricating mechanisms
- Service crankcase breathers, filters, and strainers

**Specific Competencies and Skills continued:****Fuel System**

- Inspect and clean filters
- Check fuel tank and lines
- Adjust and service fuel systems controls and linkages
- Check fuel supply systems, fuel lines, and delivery devices

**Carburetor Fundamentals**

- Identify parts and functions of carburetors
- Explain carburetor theory
- Disassemble, clean, inspect, and reassemble carburetor

**Governor**

- Inspect, service, and adjust governor
- Identify governor functions and types
- Repair governor related problems

**Ignition**

- Identify, inspect, test, and adjust ignition components
- Disassemble and reassemble ignition system
- Check condenser capacity, shorts, and coil output

**Starters And Alternators**

- Identify, inspect, and test charging and starting systems
- Service and repair charging and starting systems
- Check wiring, controls, and battery

**Cylinder Head Service And Maintenance**

- Check and record compression
- Diagnose and correct compression problems
- Remove, inspect, and reinstall cylinder head and torque bolts

## ***Specific Competencies and Skills continued:***

### **Engine Assembly**

- Identify types of internal combustion engines
- Remove, inspect, adjust, and reinstall valves
- Identify process for valve replacement and seat reconditioning
- Verify positioning of crankshaft, camshaft, balance shaft, gears, and flywheel
- Identify, inspect, and measure crankshaft, camshaft, balance shaft, gears, and flywheel
- Identify, inspect, and measure piston, rings, and connecting rod assemblies
- Check cylinder diameter and measure piston ring end gap
- Identify, inspect, and measure bearing clearances and journal diameter
- Perform break-in procedures

### **Troubleshooting**

- Troubleshoot starting problems
- Troubleshoot overheating problems
- Troubleshoot excessive fuel consumption
- Troubleshoot excessive lubricant consumptions
- Diagnose erratic or rough running conditions
- Troubleshoot causes of excessive vibration
- Diagnose low power complaints
- Diagnose unusual engine noises

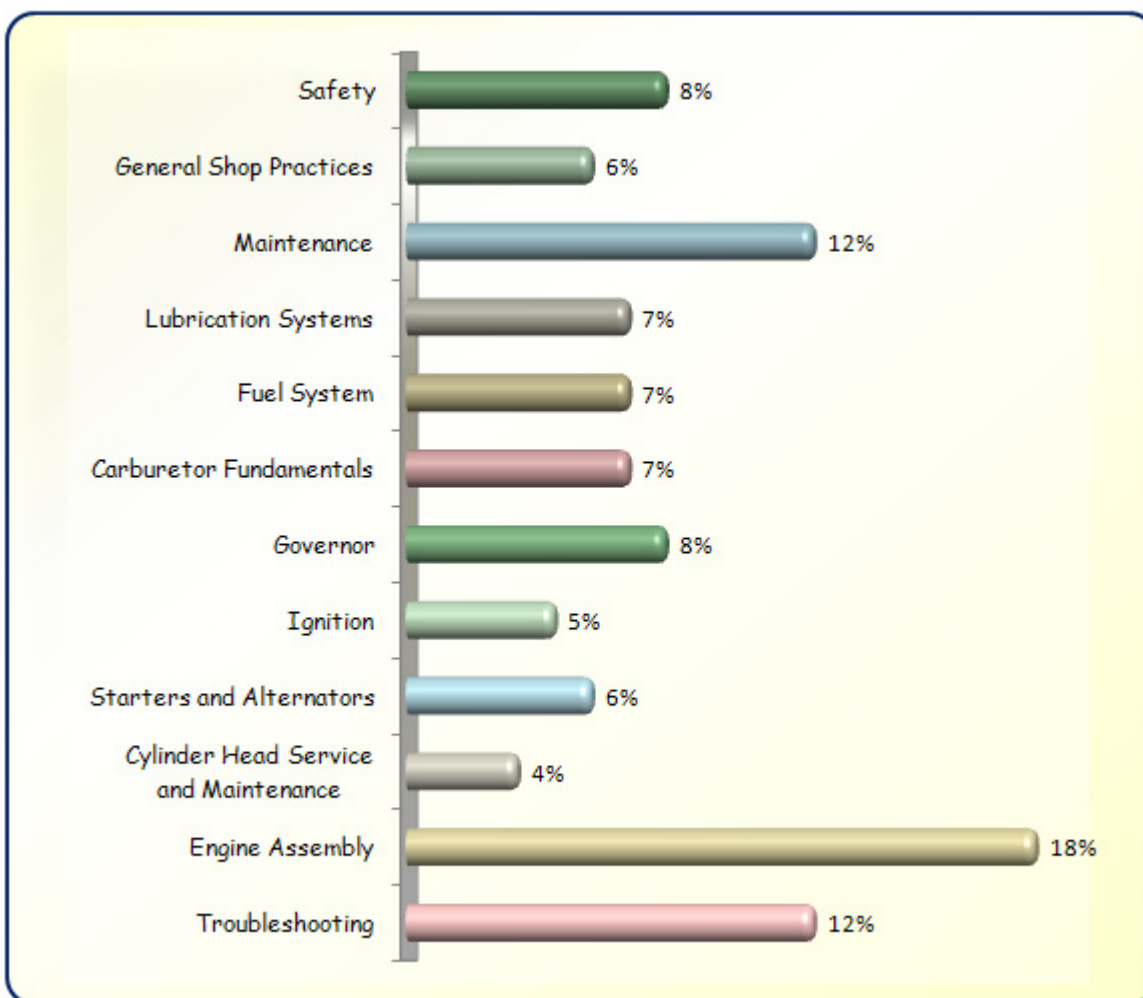


## Written Assessment:

Administration Time: 3 hours

Number of Questions: 194

### Areas Covered:



**Sample Questions:**

When using a drill press in the repair shop, it is important that the

- A. guards for moving parts are removed
- B. operator wears long sleeves
- C. part being drilled is clamped securely
- D. bench is positioned at belt height

Tighten belts on a riding lawnmower by adjusting the

- A. arm
- B. foot
- C. clutch
- D. timing

The usual ratio of air to gasoline for a small gasoline engine is

- A. 14.7:1
- B. 1:10
- C. 1.5:15
- D. 10:1

To avoid damage when disconnecting the battery,

- A. disconnect the positive terminal first
- B. disconnect the grounded terminal first
- C. drain the battery
- D. discharge the battery

Severe loss of power in a two-cycle engine could be caused by

- A. removing the air filter
- B. carbon-plugged exhaust port
- C. a plugged transfer port
- D. an improper intake valve



## Performance Assessment:

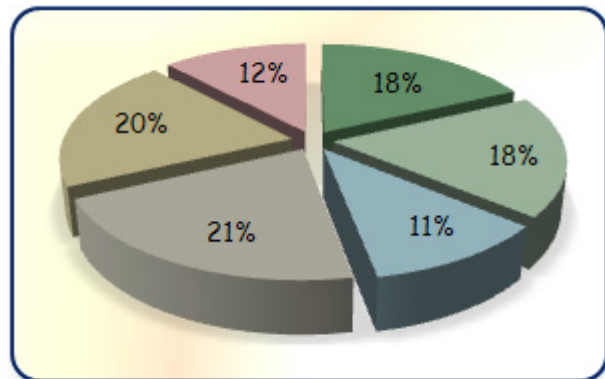
**Administration Time:** 3 hours

**Number of Jobs:** 6

### Areas Covered:

#### 18% Check and Start Engine

Locate loose engine parts and components, determine proper oil and fuel level, start and run engine, check and adjust carburetor, idle rpms and high speed rpms, record idle rpms and high speed rpms, run engine, return engine to pre-test condition, and timeliness of job.



#### 18% Ignition Service

Disassemble the engine ignition system, inspect and clean engine components, locate and read manufacturer specifications, make necessary adjustments to meet specifications, reinstall ignition components, reassemble remaining engine parts, start engine, and timeliness of job.

#### 11% Measure Parts

Check and record ring end gap, crankpin journal, cylinder bore, ring side clearance, and timeliness of job.

#### 21% Valve Service

Remove and inspect cylinder head and gasket, remove valves, inspect, measure, and record seat width, margin, valve guide intake, valve guide exhaust, install valves, check and record tappet clearance, install cylinder head gasket, torque, record cylinder head torque specifications, and timeliness of job.

***Specific Competencies and Skills continued:*****20% Carburetor Service**

Disassemble/inspect float-type carburetor, obtain floating setting, check and adjust carburetor float, reassemble float type-carburetor to original condition, disassemble diaphragm carburetor, inspect diaphragms and other carburetor components, check moveable parts for operation and condition, begin reassemble - adjust inlet metering lever height and the diaphragm carburetor to original condition, and timeliness of job.

**12% Invoicing Parts**

Look up cost of four engine parts in provided price list, calculations, completeness of information, and timeliness of job.



**Sample Job:** Invoicing Parts

**Maximum Time:** 20 minutes

**Participant Activity:** The participant will look up four engine parts that have been assigned and invoice those items including various requirements.

