JONES COUNTY CAREER-TECHNICAL CENTER

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Dear Parents and Career Tech Students:

From the Faculty, Staff and Administration of the Jones County Career Technical Center, it is our intent to provide enrichment activities for our students and support for our parents during these difficult times.

The following enrichment activities will allow students to review the instruction that they already have received this year.

You will find questions with answers for you to study and review. There are no assignments to be returned to school.

If the JCCTC can be of any assistance to our students and parents with the enrichment activities, please feel free to call us at 601-425-2378 between the hours of 9:00 a.m. and 1:00 p.m. or contact the instructor by email. Email addresses are located under the program name on our webpage.

Sincerely,

Rex Buckhaults

Rex Buckhaults
Director, JCCTC

The Jones County School District's Vocational Education Department does not discriminate on the basis of race, color, religion, national origin, sex, age, or disability in providing educational programs and services or employment opportunities and benefits The following person has been designated to handle inquiries and complaints regarding the non-discrimination policies of the school district
Mr. Mark Herrington
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1. Engine mechanical testing should be performed in all of the following situations, EXCEPT:
   A) when the engine is running rough and the customer says it needs a tune-up.
   B) before performing major engine repair.
   C) when engine noises indicate a potential mechanical fault.
   D) during a 30,000 mile service.

2. All of the following are used to fully assess the mechanical condition of an engine, EXCEPT:
   A) a compression tester.
   B) a DVOM.
   C) a scan tool.
   D) a vacuum gauge.

3. Technician A says that if an engine is losing oil but no leak source is found after a visual inspection, the technician should overfill the crankcase by adding two extra quarts and force the leak to get larger. Technician B says the technician should add a fluorescent dye to the engine oil and operate the engine while using a black light to find the leak. Who is correct?
   A) Technician A
   B) Technician B
   C) Both Technician A and Technician B
   D) Neither Technician A nor Technician B

4. What unit of measure can be used when testing engine compression and cylinder leakage?
   A) Pounds per square inch (psi) or kilopascals (kPa)
   B) Inches of vacuum or inches of mercury
   C) Foot pounds (ft-lb) or Newton meters (Nm)
   D) Watts or horsepower

5. For a cranking compression test to be completely accurate, it is recommended that:
   A) the engine be at operating temperature.
   B) all of the spark plugs be removed.
   C) the battery be fully charged.
   D) All of the answers listed

6. Technician A says that a cylinder power balance test is used to identify which cylinders are not operating properly when the vacuum test indicates a mechanical issue or when the engine is not running smoothly. Technician B says a cylinder power balance test is used as a general indication of each cylinder's overall health. Who is correct?
   A) Technician A
   B) Technician B
   C) Both Technician A and Technician B
   D) Neither Technician A nor Technician B

7. When testing intake manifold vacuum, a low steady reading at idle is likely to be caused by:
   A) a burned exhaust valve.
   B) a partially restricted exhaust.
   C) late ignition timing or valve timing.
   D) None of the answers listed

8. On an engine with a separate fuel injector for each cylinder, cylinder power balance tests may involve:
   A) disconnecting the primary electrical connector to each individual coil first.
   B) disconnecting the fuel injector wire connection at each individual injector one at a time.
   C) pulling the fuel pump relay or fuse.
   D) pulling the ECM fuse to make sure the engine doesn't start.

9. When testing intake manifold vacuum, the gauge needle oscillates back and forth rapidly, which generally indicates:
   A) a partially restricted exhaust.
   B) a mechanical condition such as a burned or bent valve.
   C) late ignition or valve timing.
   D) None of the answers listed

10. Technician A says when performing a power balance test, it is important to reactivate the disabled cylinder and allow the engine to run for at least 10 seconds to stabilize before disabling the next cylinder. Technician B says when performing a power balance test, you must shut down and restart the engine after disabling each cylinder. Who is correct?
    A) Technician A
    B) Technician B
    C) Both Technician A and Technician B
    D) Neither Technician A nor Technician B

11. How even should the cranking compression be between the lowest and highest cylinder readings on an engine without mechanical problems?
    A) Within 0% to 5%
    B) Within 10% to 15%
    C) Within 20% to 25%
    D) Within 30% to 35%

12. Which of the following malfunctions would be more likely to be revealed during a running compression test than a cranking compression test?
    A) Worn piston rings
    B) A badly worn camshaft lobe
    C) Blown head gasket
    D) Burned valve

13. When checking cranking compression, which of the following malfunctions is either confirmed or ruled out by performing a wet test on a cylinder with low compression?
    A) Worn piston rings
    B) A hole in the top of the piston
    C) A burned exhaust valve
    D) A leaking cylinder head gasket

14. A running compression test is performed on each cylinder in two parts. Technician A says after removing the spark plug and grounding the plug wire, the first part is to install the gauge, start the engine and snap the throttle open, and record the reading on each cylinder.
    Technician B says after removing the plug and grounding the wire, the first part is to install the proper hose and compression tester into the spark plug hole, start the engine, allow it to idle, press and release the bleed valve, and record the stabilized reading in each cylinder. Who is correct?
    A) Technician A
    B) Technician B
    C) Both Technician A and Technician B
    D) Neither Technician A nor Technician B

15. When the throttle is snapped wide open during a running compression test, what reading should be seen for a normal cylinder?
    A) About 50% of the cranking compression pressure
    B) About two-thirds of the cranking compression pressure
    C) About 80% of the cranking compression pressure
    D) Equal to the cranking compression pressure

16. Which of the following malfunctions is indicated by a running compression reading that rises to 95% of cranking compression pressure when the throttle is snapped to wide open?
    A) Excessive carbon buildup
    B) Restriction in the exhaust system
    C) Damaged piston rings
    D) Worn valve guides

17. What is the maximum percentage of cylinder leakage allowed by most auto manufacturers?
    A) 5%
    B) 10%
    C) 15%
    D) 20%

18. A running compression test indicates a possible restriction on the intake side of a cylinder. What should the technician do next?
    A) Inspect the suspect components.
    B) Perform a cranking compression test.
    C) Loosen the exhaust pipe and repeat the test.
    D) Squirt oil into the cylinder and repeat the test.

19. When performing a cylinder leakage test, the gauge reads 7% leakage and air leakage can be heard at the oil fill hole with the cap removed. This indicates:
    A) worn valve guides.
    B) excessively worn piston rings.
    C) a leaking cylinder head gasket.
    D) a normal amount of leakage past the piston rings.

20. An engine has one cylinder that measured substantially lower than specifications on a compression test. Technician A says a cylinder leakage test should be performed only on the cylinder with low compression pressure. Technician B says a cylinder leakage test should be performed on all cylinders. Who is correct?
    A) Technician A
    B) Technician B
    C) Both Technician A and Technician B
    D) Neither Technician A nor Technician B

21. Which color of smoke from the exhaust does NOT indicate an internal mechanical problem in the engine?
    A) Blue
    B) White
    C) Black
    D) None of the answers listed

22. A vehicle has an oil leak that is causing the entire oil pan to be wet, but inspection reveals no exact source after cleaning off the oil residue. Technician A says to install a fluorescent dye in the crankcase and operate the engine, then re-inspect for leaks with a special light (black light). Technician B says the oil leak may be coming from a source at the top of the engine, such as a valve cover gasket. Who is correct?
    A) Technician A
    B) Technician B
    C) Both Technician A and Technician B
    D) Neither Technician A nor Technician B

23. When performing a cranking sound diagnosis, Technician A says that all engines may be prevented from starting by holding the throttle wide open while cranking. Technician B says that an engine may be disabled by removing the fuel pump fuse or relay (if equipped). Who is correct?
    A) Technician A
    B) Technician B
    C) Both Technician A and Technician B
    D) Neither Technician A nor Technician B

24. A poorly running late-model vehicle is being prepared for a power balance test. Technician A says on many vehicles the test can likely be done using only a scan tool. Technician B says the test must be performed at 2500 rpm to be accurate. Who is correct?
    A) Technician A
    B) Technician B
    C) Both Technician A and Technician B
    D) Neither Technician A nor Technician B

25. When testing intake manifold vacuum, the gauge reads normal at idle, but reads very low when the engine is held steady at 2500 rpm. Technician A says this indicates worn valve guides. Technician B says this indicates a restricted exhaust system. Who is correct?
    A) Technician A
    B) Technician B
    C) Both Technician A and Technician B
    D) Neither Technician A nor Technician B

26. When testing relative compression using a lab scope and ammeter, Technician A says the current draw peaks (spikes) should be nearly equal. Technician B says the engine should be operating at idle for any lab scope test. Who is correct?
    A) Technician A
    B) Technician B
    C) Both Technician A and Technician B
    D) Neither Technician A nor Technician B

27. Technicians A and B are discussing how to obtain the most accurate results when testing cranking compression on a gasoline engine. Technician A says the battery must be fully charged. Technician B says at least five compression pulses should be made on each cylinder while watching the gauge. Who is correct?
    A) Technician A
    B) Technician B
    C) Both Technician A and Technician B
    D) Neither Technician A nor Technician B

28. Which of the following can be measured by a running compression test, but NOT by a cranking compression test?
    A) The sealing capability of the valves
    B) The sealing capability of the rings and pistons
    C) The ability of the engine move air in and out of the cylinder
    D) None of the answers listed

29. During a running compression test, a cylinder rises to about 80% of the cranking compression pressure when the throttle is snapped to wide open. Technician A says this may indicate a worn camshaft lobe. Technician B says this may indicate excessive carbon buildup. Who is correct?
    A) Technician A
    B) Technician B
    C) Both Technician A and Technician B
    D) Neither Technician A nor Technician B

30. When diagnosing engine noise, Technician A says a mechanical stethoscope may not be appropriate in pinpointing a squeaking drive belt. Technician B says a whirring noise is likely to be from external accessories such as alternators, water pumps and belt tensioners. Who is correct?
    A) Technician A
    B) Technician B
    C) Both Technician A and Technician B
    D) Neither Technician A nor Technician B

31. Which of the following is one of the first steps a technician should take when a customer reports excessive oil consumption?
    A) Take the vehicle on a road test.
    B) Change the oil and filter to make sure they are the right kind.
    C) Find out the oil consumption allowance specified by the manufacturer.
    D) Look for signs of abusive driving.

32. Technician A says that a light ticking noise while the engine is idling could be a valve lifter problem. Technician B says a vibration that occurs only on moderate acceleration is likely caused by worn crankshaft bearings. Who is correct?
    A) Technician A
    B) Technician B
    C) Both Technician A and Technician B
    D) Neither Technician A nor Technician B

33. A vehicle has black smoke coming from the exhaust after the engine is warmed up. Technician A says this may indicate worn valve springs. Technician B says this may indicate an excessively rich fuel mixture. Who is correct?
    A) Technician A
    B) Technician B
    C) Both Technician A and Technician B
    D) Neither Technician A nor Technician B

34. The _____ reading shows the difference between the outside atmospheric pressure and the amount of manifold pressure in the engine.
    A) vacuum gauge
    B) cylinder gauge
    C) compression
    D) pressure

35. Technician A says that using a pressure transducer and lab scope is a similar process to using a vacuum gauge. Technician B says the pressure transducer may be used to tie any issues to individual cylinders if paired with a second trace consisting of the ignition pattern. Who is correct?
    A) Technician A
    B) Technician B
    C) Both Technician A and Technician B
    D) Neither Technician A nor Technician B

36. When performing vacuum testing, Technician A says the vacuum reading at idle will be higher on an engine with a high-performance camshaft than a normal engine. Technician B says that the gauge readings for a normal engine will be higher at high altitudes than at sea level. Who is correct?
    A) Technician A
    B) Technician B
    C) Both Technician A and Technician B
    D) Neither Technician A nor Technician B

37. An engine's vacuum is being tested with a gauge. When the throttle is snapped wide open momentarily, the gauge drops to zero and then reaches a high of 20 inches. Technician A says this could indicate worn piston rings. Technician B says the reading should have reached about 27 inches. Who is correct?
    A) Technician A
    B) Technician B
    C) Both Technician A and Technician B
    D) Neither Technician A nor Technician B

38. Technician A says vacuum traces should be taken at idle, 1200 rpm, and 2500 rpm when using a pressure transducer. Technician B says vacuum testing should only be performed at idle speed. Who is correct?
    A) Technician A
    B) Technician B
    C) Both Technician A and Technician B
    D) Neither Technician A nor Technician B

39. When performing a cranking compression test, Technician A says the final reading should be reached on the second compression pulse. Technician B says the first compression pulse should read at least half as much as the final reading. Who is correct?
    A) Technician A
    B) Technician B
    C) Both Technician A and Technician B
    D) Neither Technician A nor Technician B

40. Technicians A and B are discussing cylinder leakage test results. Technician A says that 5% leakage past the exhaust valves is acceptable. Technician B says that all piston rings will leak at least 20%. Who is correct?
    A) Technician A
    B) Technician B
    C) Both Technician A and Technician B
    D) Neither Technician A nor Technician B

Answer Key

1. D
2. B
3. B
4. A
5. D
6. C
7. C
8. B
9. B
10. A
11. B
12. B
13. A
14. B
15. C
16. B
17. D
18. A
19. D
20. A
21. C
22. C
23. B
24. A
25. B
26. A
27. C
28. C
29. D
30. C
31. C
32. A
33. B
34. A
35. C
36. D
37. C
38. A
39. B
40. D

1. Lubricating oil that is used in engines is made by refining:
   A) ground oil.
   B) mineral oil.
   C) crude oil.
   D) rig oil.

2. Which of the following is NOT a function of lubricating oil?
   A) Cool
   B) Clean
   C) Seal
   D) Burn

3. The measure of how easily a liquid flows is called its:
   A) flowability.
   B) viscosity.
   C) elasticity.
   D) polymer.

4. The main function of motor oil is to reduce _____ between moving parts of the engine.
   A) friction
   B) movement
   C) viscosity
   D) cooling

5. The additive found in oil that minimizes the formation of air bubbles in the oil is called a(n):
   A) antifoaming agent.
   B) pour point depressant.
   C) dispersant.
   D) viscosity index improver.

6. The oil additive that keeps oil from gelling under cold temperatures is called a(n):
   A) antifoaming agent.
   B) pour point depressant.
   C) dispersant.
   D) viscosity index improver.

7. The oil additive that helps reduce the change in the oil's ability to flow as the temperature of the oil changes is a(n):
   A) antifoaming agent.
   B) pour point depressant.
   C) dispersant.
   D) viscosity index improver.

8. The oil additive that reduces the effect of oil churning in the crankcase is known as a(n):
   A) detergent.
   B) antifoaming agent.
   C) dispersant.
   D) pour point depressant.

9. The oil additive that collects particles that can block the system is called a(n):
   A) pour point depressant.
   B) antifoaming agent.
   C) detergent.
   D) dispersant.

10. The "W" in 5W-30 stands for:
   A) weight.
   B) winter.
   C) work.
   D) water.

11. Most oil pumps are the _____ displacement type.
   A) forward
   B) positive
   C) negative
   D) centrifugal

12. The passages that oil passes through to get to different parts of the engine are called oil:
   A) galleries.
   B) tubes.
   C) flows.
   D) weep holes.

13. A device that is external to the engine and helps remove heat from the oil is called a(n):
    A) oil cooler.
    B) heat sync.
    C) evaporator.
    D) heater core

14. _____ coat parts with a protective layer so that the oil resists being forced out under heavy load.
    A) Oxidation-pressure additives
    B) Extreme pressure additives
    C) Corrosion inhibitors
    D) Detergents

15. An oil pump that is capable of delivering a larger amount of oil than a high-pressure oil pump is called a:
    A) crescent pump.
    B) centrifugal pump.
    C) high-volume pump.
    D) nonpositive displacement pump.

16. Technician A says that oil pressure is vital to engine operation. Technician B says that a pressure sensor can turn on a light to alert the driver of low oil pressure. Who is correct?
    A) Technician A
    B) Technician B
    C) Both Technician A and Technician B
    D) Neither Technician A nor Technician B

17. _____ are designed to filter all of the oil before delivering it to the engine.
    A) Bypass filters
    B) Full-flow filters
    C) Pleated filters
    D) None of the answers listed

18. Technician A says that oil pressure is monitored by an oil pressure gauge. Technician B says that oil pressure is monitored by an oil level monitoring system. Who is correct?
    A) Technician A
    B) Technician B
    C) Both Technician A and Technician B
    D) Neither Technician A nor Technician B

19. A crescent oil pump is:
    A) is mounted to the camshaft.
    B) is mounted to the oil sump.
    C) is mounted to the rear of the engine.
    D) is mounted on the front of the cylinder block and straddles the front of the crankshaft.

20. Technician A says that to ensure that the oil filter does not leak, you may use two gaskets. Technician B says that using two gaskets could cause an oil leak when the oil is pressurized. Who is correct?
    A) Technician A
    B) Technician B
    C) Both Technician A and Technician B
    D) Neither Technician A nor Technician B

21. Technician A says that most two-stroke engines have a pressure type lubrication system. Technician B says that four-stroke engines do not require the mixing of oil with gasoline. Who is correct?
    A) Technician A
    B) Technician B
    C) Both Technician A and Technician B
    D) Neither Technician A nor Technician B

22. Technician A says that all components inside an automotive engine are pressure- or force-fed the oil that they need. Technician B says that some components rely on splash lubrication to function properly. Who is correct?
    A) Technician A
    B) Technician B
    C) Both Technician A and Technician B
    D) Neither Technician A nor Technician B

23. A scavenge pump is used on a:
    A) wet sump oil system.
    B) dipper type oil system.
    C) dry sump oil system.
    D) splash type oil system.

24. Which of the following can be said about engine oil?
    A) It has a low coefficient of friction.
    B) It creates a protective layer between two metal components.
    C) It causes the metal components to expand.
    D) All of the answers listed

25. On horizontal-crankshaft engines, a(n) _____ on the bottom of the connecting rod scoops up oil from the crankcase for the bearings.
    A) oil slinger
    B) scavenge pump
    C) crescent pump
    D) dipper

26. Crude oil:
    A) varies in color from a dirty yellow to dark brown to black.
    B) can be thin like gasoline or a thick, oil-or tarlike substance.
    C) is pumped from the ground and processed into many products such as fuel for use in diesel and gasoline vehicles.
    D) All of the answers listed

27. Most small four-stroke gasoline engines use only _____ to lubricate all of the parts of the engine.
    A) a pressure lubrication system
    B) a dry sump lubrication system
    C) a splash lubrication system
    D) a wet sump lubrication system

28. Cast or drilled into the engine block and head(s), _____ are the passageways that carry oil through the engine.
    A) metal tubing.
    B) oil galleries.
    C) oil slingers.
    D) oil dippers.

29. Which of the following is NOT one of the certifying bodies for engine oil?
    A) AYES
    B) API
    C) SAE
    D) ILSAC

30. Technician A says that an oil slinger is used in high-pressure oil systems. Technician B says that an oil slinger can be driven by the crankshaft or camshaft. Who is correct?
    A) Technician A
    B) Technician B
    C) Both Technician A and Technician B
    D) Neither Technician A nor Technician B

31. How often should the oil in a vehicle be checked?
    A) Once every couple of months
    B) Each time or every other time you fill the gas tank
    C) Annually
    D) Only at each oil change interval

32. Technician A says that if oil is milky or gray, it may have been contaminated with water or coolant. Technician B says that milky-colored coolant could indicate a blown head gasket. Who is correct?
    A) Technician A
    B) Technician B
    C) Both Technician A and Technician B
    D) Neither Technician A nor Technician B

33. Technician A says that an oil drain plug gasket made of aluminum, plastic, or fiber is reusable. Technician B says that a drain plug with an integrated silicone gasket is reusable as long as it is in good condition. Who is correct?
    A) Technician A
    B) Technician B
    C) Both Technician A and Technician B
    D) Neither Technician A nor Technician B

34. Technician A says that when installing an oil filter, you should tighten it with a filter wrench to prevent it from falling off. Technician B says that oil filters should only be installed by hand. Who is correct?
    A) Technician A
    B) Technician B
    C) Both Technician A and Technician B
    D) Neither Technician A nor Technician B

35. Oil additives include all of the following, EXCEPT:
    A) extreme pressure additives.
    B) oxidation inhibitors.
    C) mineral oil.
    D) corrosion inhibitors.

36. Tools for lubrication repair include:
    A) a variety of oil filters.
    B) a set of wrenches and a socket.
    C) a mirror and a quality light for leak testing.
    D) All of the answers listed

37. Technician A says that after completing an oil change, the oil change reminder will automatically turn off. Technician B says that in most vehicles, you will have to refer to service information to find the procedure for resetting the oil change reminder light. Who is correct?
    A) Technician A
    B) Technician B
    C) Both Technician A and Technician B
    D) Neither Technician A nor Technician B

38. Technician A says that before checking the oil level, the vehicle must be on a level surface. Technician B says that the vehicle should be placed on jack stands. Who is correct?
    A) Technician A
    B) Technician B
    C) Both Technician A and Technician B
    D) Neither Technician A nor Technician B

39. All of the following are important steps when checking the oil level, EXCEPT:
    A) make sure the vehicle is on a level surface.
    B) wipe off and reinsert the dipstick before removing it and reading it.
    C) hold the dipstick horizontally when reading it.
    D) make sure the engine is running.

40. Technician A says that how long an engine lasts is directly related to how well it is lubricated. Technician B says that the lubrication system helps cool the engine components. Who is correct?
    A) Technician A
    B) Technician B
    C) Both Technician A and Technician B
    D) Neither Technician A nor Technician B

Answer Key

1. C
2. D
3. B
4. A
5. A
6. B
7. D
8. B
9. D
10. B
11. B
12. A
13. A
14. B
15. C
16. C
17. B
18. A
19. D
20. B
21. B
22. B
23. C
24. D
25. D
26. D
27. C
28. B
29. A
30. B
31. B
32. C
33. B
34. B
35. C
36. D
37. B
38. A
39. D
40. C