

Chapter 1 (Classroom Manual) - Automotive Engines

True / False

1. Modern engines are called internal combustion engines since the fuels burn within the engine.

a. True

b. False

ANSWER: True

2. The powertrain includes the engine, transmission, axles, and suspension system.

a. True

b. False

ANSWER: False

3. The camshaft is responsible for opening the engine valves.

a. True

b. False

ANSWER: True

4. Both the cooling and lubrication systems remove heat from the engine.

a. True

b. False

ANSWER: True

5. The camshaft spins at twice the speed of the crankshaft.

a. True

b. False

ANSWER: False

6. Low engine oil pressure can cause excessive engine wear.

a. True

b. False

ANSWER: False

7. Turbochargers and superchargers force more air and fuel into the engine to increase performance.

a. True

b. False

ANSWER: False

8. Overheating an engine can lead to a blown head gasket.

a. True

b. False

ANSWER: True

9. The powertrain control module controls fuel delivery to the engine.

a. True

b. False

ANSWER: True

10. OHV engines have the camshaft located in the cylinder head with other valvetrain components.

a. True

b. False

ANSWER: False

Multiple Choice

11. Which of the following is not characteristic of modern engines?

a. increased fuel economy

b. increased maintenance requirements

c. reduced emissions

d. reduced weight

ANSWER: b

12. Which of the following is not a part of the combustion chamber?

a. Piston

b. Intake valve

c. Exhaust valve

d. Camshaft

ANSWER: d

13. Which of the following is not contained in the modern engine block?

a. Pistons

b. Crankshaft

c. Valves

d. Connecting rods

ANSWER: c

Technician A says a transversely mounted engine is common in RWD vehicles. Technician B says longitudinally mounted engines are common in RWD vehicles. Who is correct?

14. Technician A says a transversely mounted engine is common in RWD vehicles.

Technician B says longitu...

a. Technician A

b. Technician B

- c. Both A and B
- d. Neither A nor B

ANSWER: b

Technician A says camshafts control the operation of the valves. Technician B says camshafts control the timing of the valves. Who is correct?

15. Technician A says camshafts control the operation of the valves. Technician B says camshafts control...

- a. Technician A
- b. Technician B
- c. Both A and B
- d. Neither A nor B

ANSWER: c

16. Valve timing refers to:

- a. How long the valves are held open
- b. The relationship between cam and crank rotation
- c. The relationship between how long a valve is open compared to closed
- d. None of these

ANSWER: b

17. The engine can be connected to the transmission by which of the following?

- a. Flexplate
- b. Flywheel
- c. Torque converter
- d. Both B and C

ANSWER: d

18. All of the following are functions of the transmission except:

- a. Torque multiplication to increase power
- b. Reduce torque and increase speed
- c. Gear reduction to decrease torque
- d. Manipulate torque to drive the wheels

ANSWER: c

19. Engine heat is removed by which of the following?

- a. Air passing over the radiator
- b. Oil lubricating moving components
- c. Engine surface area to the surrounding air
- d. All of the above

ANSWER: d

Technician A says the engine breathes through the intake and exhaust systems.

Technician B any restriction in intake or exhaust system will negatively affect an engine's performance. Who is correct?

20. Technician A says the engine breathes through the intake and exhaust systems.

Technician B any restr...

- a. Technician A
- b. Technician B
- c. Both A and B
- d. Neither A nor B

ANSWER: c

21. Which of the following is not part of a cylinder head?

- a. Camshaft
- b. Connecting rods
- c. Valves
- d. Rocker arms

ANSWER: b

22. All of the following are components of the valvetrain except:

- a. Pushrod
- b. Lifter
- c. Camshaft
- d. Crankshaft

ANSWER: d

23. What can result from a failure of the timing belt or chain?

- a. Bent valves
- b. Piston damage
- c. Cylinder head damage
- d. All of the above

ANSWER: d

24. Piston rings are used to:

- a. Seal the combustion chamber
- b. Remove excess oil from the cylinder wall
- c. Both A and B
- d. None of the above

ANSWER: c

Blue smoke is present in the exhaust. Technician A says this can indicate worn piston rings. Technician B says this can indicate improper valve adjustment. Who is correct?

25. Blue smoke is present in the exhaust. Technician A says this can indicate worn piston rings. Technic...

- a. Technician A

- b. Technician B
- c. Both A and B
- d. Neither A nor B

ANSWER: a

26. A severely worn lifter can cause which of the following:

- a. Rough idle
- b. Lack of power
- c. Low compression
- d. All of these

ANSWER: d

Completion

27. Bearing material is _____ than the metal of the component they support.

ANSWER: softer

28. The _____ contains all of the components that deliver engine power to the road.

ANSWER: powertrain

29. The piston is driven up and down in the _____.

ANSWER: cylinder bore

30. The crankshaft and connecting rod turn _____ motion into _____ motion.

ANSWER: reciprocating, rotary

31. The relationship between the crankshaft and camshaft rotation is called _____.

ANSWER: valve timing

32. The _____ has eccentric lobes which open the valves.

ANSWER: camshaft

33. Rubber bushings are used to isolate engine _____ from the _____.

ANSWER: vibration, chassis

34. When the engine coolant reaches a certain temperature, the _____ opens to allow the coolant to flow to the radiator.

ANSWER: thermostat

35. An engine that is severely overheated may cause damage to the _____.

ANSWER: cylinder head gasket.

36. The _____ connects air tubes to the cylinder head to distribute air to each cylinder.

ANSWER: intake manifold

37. The PCM controls _____ and _____, among other functions.

ANSWER: fuel delivery, spark timing

Essay

38. Explain the four strokes of the gasoline engine.

ANSWER: As the intake valve opens and the piston moves downward in the cylinder, low pressure in the cylinder draws air and fuel into the combustion chamber. Once the intake valve closes the piston moves upward, compressing the air/fuel mixture. The spark plug ignites the mixture when the piston is near top dead center. The resulting increase in pressure forces the piston down the bore, transferring force to the crankshaft. As the piston moves back up the exhaust valve opens and the exhaust gases leave the cylinder.

39. Why are transversely mounted engines popular in modern vehicle design?

ANSWER: A transversely mounted engine allows for more passenger compartment space and shorter hood lines.

40. What are three functions of the cooling system?

ANSWER: The cooling system must retain heat for fast engine warm-up, maintain a consistent operating temperature for engine efficiency, and remove excess heat to prevent engine damage.

41. How can turbocharging and supercharging increase an engine's performance?

ANSWER: Both turbochargers and superchargers increase air flow into the engine by forcing more air in under pressure. If more air is forced in then more fuel can also be used as well.

42. What is the function of the valvetrain?

ANSWER: The valvetrain components are responsible for the opening and closing of the valves in conjunction with the movement of the crankshaft and pistons.