Automotive Electrical and Engine Performance 9th Edition
Chapter 16 – Temperature and Throttle Position Sensors
Quiz B

1. What is the primary function of an engine coolant temperature (ECT) sensor?

a. Regulating the engine's ignition timing exclusively

b. Controlling air–fuel ratio during closed-loop operation

c. Providing temperature input for ignition timing and fuel adjustments

d. Enhancing the accuracy of manifold absolute pressure readings

2. What does the term "negative temperature coefficient" (NTC) mean for sensors?

a. Resistance increases as temperature increases

b. Resistance decreases as temperature increases

c. Voltage output increases as temperature decreases

d. Voltage remains constant despite temperature changes

3. Which factor can skew ECT sensor readings and lead to a lean air–fuel mixture?

a. A low-resistance short in the ECT sensor

b. A high-resistance open in the ECT circuit

c. A partially clogged ECT connector

d. An ECT sensor exposed to air pockets in the coolant

4. What is the purpose of the stepped ECT circuit in certain vehicles?

a. To adjust timing automatically when the engine is hot

b. To enable more accurate temperature readings at different ranges

c. To regulate voltage for the alternator at high engine speeds

d. To simplify coolant pressure monitoring

5. How does a faulty intake air temperature (IAT) sensor affect engine performance?

a. Delays ignition timing in cold weather

b. Causes incorrect air–fuel adjustments based on temperature

c. Prevents the PCM from entering closed-loop operation

d. Disables the oxygen sensor

6. Which tool is most effective for measuring the resistance of a temperature sensor?

a. Scan tool with real-time graphing capability

b. Oscilloscope for waveforms

c. Digital multimeter set to ohms

d. Data logging software on a PCM

7. What voltage would you expect to read at the throttle position sensor (TPS) at idle?

a. 1.5 volts

b. 0.5 volts

c. 4.5 volts

d. 5 volts

8. How does the PCM use the throttle position sensor for transmission control?

a. To adjust shift points during wide-open throttle

b. To monitor fluid temperature indirectly

c. To calculate RPM ranges for overdrive activation

d. To disable the air-conditioning compressor under heavy loads

9. Which sensor does the throttle position sensor typically back up in case of failure?

a. Oxygen sensor

b. MAF sensor

c. MAP sensor

d. Cylinder head temperature sensor

10. What is the effect of a faulty EGR temperature sensor?

a. High oxides of nitrogen (NOx) emissions

b. Low exhaust backpressure readings

c. False cylinder misfire detection

d. Premature ignition timing errors

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Correct Answers:

1. c

2. b

3. a

4. c

5. b

6. d

7. b

8. a

9. b

10. c