Continuing Education Course #208
Future Highways - Automated Vehicles

1. Automated vehicles have the potential to significantly reduce traffic congestion, which would have the following effect:
- a. Decreased greenhouse gas emissions
- b. Increased productivity
- c. Decreased energy consumption
- d. Improved quality of life
- e. All of the above

2. The U.S. Interstate Highway System is comprised of approximately how many miles?
- a. 20,000
- b. 45,000
- c. 60,000
- d. 100,000

3. Approximately how many additional billions of hours did Americans spend traveling due to congested traffic conditions in 2017?
- a. 5.8
- b. 6.8
- c. 7.8
- d. 8.8

4. Trucks contribute what percent to urban congestion?
- a. 7
- b. 8
- c. 10
- d. 11

5. How many billions of dollars in time and fuel did commuters spend due to congestion in 2017?
- a. 100
- b. 125
- c. 166
- d. 200

6. Transportation contributed what percentage of the U.S. Greenhouse Gas Emissions in 2019?
- a. 15
- b. 25
- c. 29
- d. 32

7. There were approximately how many millions of injuries due to automobile crashes in the U.S. in 2019?

- a. 1.5
- b. 2.74
- c. 2.5
- d. 3.0

8. What is the biggest reason for automobile crashes?
- a. Poor pavement condition
- b. Adverse weather
- c. Human error
- d. Vehicle mechanical failure

9. Automated highway systems could achieve reductions in crash frequency, energy consumption, vehicle emissions, and…
- a. Personal travel mobility
- b. Total person-miles of travel
- c. Travel times
- d. Pavement maintenance

10. The future advances of automated vehicles, according to NHTSA research, could prevent 50 percent of crashes involving non-impaired vehicles.
- a. True
- b. False

11. V2X is a more general term for vehicle-to-vehicle and vehicle-to-infrastructure communication technologies.
- a. True
- b. False

12. The NHTSA-defined level of vehicle automation that involves automation where the vehicle can itself perform all aspects of the driving task under some circumstances and the human driver must be ready to take back control at any time when the ADS requests the human driver to do so.
- a. Level 1
- b. Level 2
- c. Level 3
- d. Level 4
- e. Level 5

13. Which of the following is LIDAR not used for, directly or indirectly, in autonomous vehicles?
- a. 3D mapping of the surrounding environment
- b. Detecting traffic signs and signals
- c. Identifying the fastest travel route between an origin and destination
- d. Detecting obstacles within the roadway
- e. Identifying valid travel paths

14. Radar sensors provide vehicle route mapping in real time.
- a. True
- b. False

15. Autonomous vehicles have the potential to save millions of dollars by reducing…
- a. Car repairs
- b. Insurance claims

○ c. Medical bills
○ d. All of the above

16. A potential disadvantage to autonomous vehicles includes an increase in needed parking spaces.
○ a. True
○ b. False

17. V2X could utilize real time vehicle data to deploy maintenance crews and emergency vehicles, as well as let drivers know to move aside for emergency vehicles to pass.
○ a. True
○ b. False

18. DSRC stands for
○ a. Digital Short Range Communications
○ b. Dedicated Short Range Cars
○ c. Dedicated Short Range Communications
○ d. Digital Signal Reflection Compression

19. Basic Safety Messages (BSM) are typically transmitted at what rate?
○ a. 5 Hz
○ b. 8 Hz
○ c. 10 Hz
○ d. 12 Hz

20. Which state has not passed legislation specific to automated vehicles?
○ a. Florida
○ b. Montana
○ c. Michigan
○ d. Nevada

21. Interrupted-flow facilities are considered to be roadways in which external controls, such as traffic signals and stops signs, are present.
○ a. True
○ b. False

22. Only one factor, queue discharge rate, influences the capacity of traffic movements at a signalized intersection.
○ a. True
○ b. False

23. Geometric design is largely predicated on three factors: vehicle performance as a function of physics, sight distance (human) for safe stopping, and vehicle dimensions.
○ a. True
○ b. False

24. _____ generally refers to the issue of how far in advance a vehicle driver can detect a potential obstacle in the roadway.
○ a. Horizontal curve
○ b. Vertical curve
○ c. Sight triangles
○ d. Sight distance

25. Sight distance is a critical factor in designing the rate of change of slope for a vertical curve.

- ○ a. True
- ○ b. False