NCEES
PE-Civil-Transportation
1226 PE Civil Transportation

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Question: 1

A traffic engineer is tasked with developing a signal phasing plan for a complex intersection. If the left-turn phase is protected and is followed by an all-red phase, what is the purpose of the all-red phase in this context?

A. To allow vehicles to clear the intersection
B. To optimize signal timing
C. To minimize vehicle delays
D. To provide a buffer for pedestrian crossings

Answer: D

Explanation:
The all-red phase provides a buffer for pedestrian crossings, ensuring that the intersection is clear of vehicles before pedestrians begin crossing, enhancing safety.

Question: 2

At a roundabout, an engineer notes that the entry width is designed to be 10 feet, while the circulating roadway width is 15 feet. If the design vehicle is a large truck, what should be the minimum central island radius to ensure safe navigation?

A. 50 feet
B. 40 feet
C. 30 feet
D. 60 feet

Answer: A

Explanation:
For a large truck navigating a roundabout, a minimum central island radius of 50 feet is recommended to ensure that the vehicle can make the turn without encroaching on the circulating roadway.

Question: 3

A pedestrian crossing at a signalized intersection has a crosswalk length of 70 feet. If the average walking speed is 4 feet per second, what is the minimum pedestrian crossing time that should be allocated during the signal phase?

A. 15 seconds

B. 17 seconds
C. 20 seconds
D. 25 seconds

Answer: C

Explanation:
The minimum pedestrian crossing time can be calculated as Rounding up, a minimum of 20 seconds should be provided to ensure pedestrian safety.

Question: 4

What is the primary reason for using the Highway Capacity Manual (HCM) methodology in capacity analysis, especially for urban intersections?

A. It emphasizes vehicle speed
B. It focuses only on free-flow conditions
C. It simplifies roundabout analysis
D. It incorporates pedestrian and bicycle traffic

Answer: D

Explanation:
The HCM methodology incorporates various factors, including pedestrian and bicycle traffic, which is crucial for urban intersections where multimodal transport is common.

Question: 5

During a traffic signal timing analysis, an engineer determines that the total cycle length for the intersection is 90 seconds. If the green time for the main road is set at 60 seconds, what is the maximum allowable clearance interval for the main road, assuming a safe stopping distance for vehicles?

A. 10 seconds
B. 30 seconds
C. 20 seconds
D. 15 seconds

Answer: D

Explanation:
Assuming a safe stopping distance, the clearance interval for the main road should not exceed 15 seconds to allow adequate time for vehicles to clear the intersection before the opposing traffic receives a green signal.

Question: 6

During a safety audit of a freeway interchange, it is noted that the sight distance for vehicles merging onto the freeway is inadequate. What immediate action should the engineer recommend to improve safety?

A. Increase the speed limit on the freeway.
B. Extend the length of the acceleration lane.
C. Reduce the number of lanes on the freeway.
D. Add more signage on the entrance ramp.

Answer: B

Explanation:
Extending the length of the acceleration lane allows merging vehicles to reach the speed of mainline traffic safely, improving safety and reducing potential conflicts.

Question: 7

During a traffic study, an engineer determines that the existing signal timing does not accommodate high pedestrian demand during school hours. What immediate adjustment should be made?

A. Decrease the green time for vehicles
B. Increase the total cycle length
C. Add more pedestrian crossing signals
D. Implement flashing school zone signals

Answer: B

Explanation:
Increasing the total cycle length can help accommodate high pedestrian demand during school hours, allowing for adequate crossing time without significantly disrupting vehicular flow.

Question: 8

A bicycle lane is to be constructed with a physical separation from motor vehicle traffic. According to best practices, what is the minimum recommended width for this separated bike lane to ensure cyclist comfort and safety?

A. 6 feet
B. 5 feet
C. 4 feet
D. 8 feet

Answer: A

Explanation:
A minimum width of 6 feet for separated bike lanes is recommended to provide adequate space for cyclists, enhancing safety and comfort, particularly when overtaking other cyclists or encountering obstacles.

Question: 9

In capacity analysis of a roundabout, which geometric feature has the most significant effect on the entry capacity?

A. Entry angle of the approach
B. Diameter of the roundabout
C. Number of circulating lanes
D. Presence of pedestrian crossings

Answer: A

Explanation:
The entry angle significantly affects the yield behavior of vehicles entering the roundabout and thus influences the entry capacity.

Question: 10

A contractor estimates that the quantity of asphalt needed for a road project is 15,000 tons. If the unit cost of asphalt is $80 per ton, what is the total estimated cost for asphalt?

A. $1 million
B. $1.8 million
C. $1.2 million
D. $1.5 million

Answer: C

Explanation:
The total estimated cost is calculated as Quantity
× Unit Cost. Thus, Total Cost = 15,000 tons × $80/ton = $1.2 million.

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