

# Multiple-Choice Test

## Chapter 05.02

### Direct Method of Interpolation

1. A unique polynomial of degree \_\_\_\_\_ passes through  $n + 1$  data points.
- (A)  $n + 1$
  - (B)  $n + 1$  or less
  - (C)  $n$
  - (D)  $n$  or less

2. The following data of the velocity of a body is given as a function of time.

Time (s)	0	15	18	22	24
Velocity (m/s)	22	24	37	25	123

The velocity in m/s at 16 s using linear polynomial interpolation is most nearly

- (A) 27.867
  - (B) 28.333
  - (C) 30.429
  - (D) 43.000
3. The following data of the velocity of a body is given as a function of time.

Time (s)	0	15	18	22	24
Velocity (m/s)	22	24	37	25	123

The velocity in m/s at 16 s using quadratic polynomial interpolation is most nearly

- (A) 27.867
  - (B) 28.333
  - (C) 30.429
  - (D) 43.000
4. The following data of the velocity of a body is given as a function of time.

Time (s)	0	15	18	22	24
Velocity (m/s)	22	24	37	25	123

Using quadratic interpolation, the interpolant

$$v(t) = 8.667t^2 - 349.67t + 3523, \quad 18 \leq t \leq 24$$

approximates the velocity of the body. From this information, the time in seconds at which the velocity of the body is 35 m/s during the above time interval of  $t = 18$  s to  $t = 24$  s is

- (A) 18.667
- (B) 20.850
- (C) 22.200
- (D) 22.294

5. The following data of the velocity of a body is given as a function of time.

Time (s)	0	15	18	22	24
Velocity (m/s)	22	24	37	25	123

One of the interpolant approximations for the velocity from the above data is given as

$$v(t) = 8.6667t^2 - 349.67t + 3523, \quad 18 \leq t \leq 24$$

Using the above interpolant, the distance in meters covered by the body between  $t = 19$  s and  $t = 22$  s is most nearly

- (A) 10.337  
 (B) 88.500  
 (C) 93.000  
 (D) 168.00
6. The following data of the velocity of a body is given as a function of time.

Time (s)	0	15	18	22	24
Velocity (m/s)	22	24	37	25	123

If you were going to use quadratic interpolation to find the value of the velocity at  $t = 14.9$  seconds, what three data points of time would you choose for interpolation?

- (A) 0, 15, 18  
 (B) 15, 18, 22  
 (C) 0, 15, 22  
 (D) 0, 18, 24

For a complete solution, refer to the links at the end of the book.