Multiple-Choice Test

Chapter 07.03
Simpson's 1/3 Rule

1. The highest order of polynomial integrand for which Simpson's 1/3 rule of integration is exact is
   (A) first
   (B) second
   (C) third
   (D) fourth

2. The value of $\int_{0.2}^{2.2} e^x dx$ by using 2-segment Simpson's 1/3 rule most nearly is
   (A) 7.8036
   (B) 7.8423
   (C) 8.4433
   (D) 10.246

3. The value of $\int_{0.2}^{2.2} e^x dx$ by using 4-segment Simpson's 1/3 rule most nearly is
   (A) 7.8036
   (B) 7.8062
   (C) 7.8423
   (D) 7.9655

4. The velocity of a body is given by
   $$v(t) = 2t, \qquad 1 \le t \le 5$$
   $$= 5t^2 + 3, \quad 5 < t \le 14$$
   where t is given in seconds, and v is given in m/s. Using two-segment Simpson's 1/3 rule, the distance in meters covered by the body from $t = 2$ to $t = 9$ seconds most nearly is
   (A) 949.33
   (B) 1039.7
   (C) 1200.5
   (D) 1442.0

5. The value of $\int_3^{19} f(x)dx$ by using 2-segment Simpson's 1/3 rule is estimated as 702.039. The estimate of the same integral using 4-segment Simpson's 1/3 rule most nearly is

(A) $702.039+\frac{8}{3}[2f(7)-f(11)+2f(15)]$

(B) $\frac{702.039}{2}+\frac{8}{3}[2f(7)-f(11)+2f(15)]$

(C) $702.039+\frac{8}{3}[2f(7)+2f(15)]$

(D) $\frac{702.039}{2}+\frac{8}{3}[2f(7)+2f(15)]$

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

Time (s)	4	7	10	15
Velocity (m/s)	22	24	37	46

The best estimate of the distance in meters covered by the body from $t=4$ to $t=15$ using combined Simpson's 1/3 rule and the trapezoidal rule would be

(A) 354.70
(B) 362.50
(C) 368.00
(D) 378.80

Complete Solution