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Ans. No - 1

Relative true error: Relative error is a measure of precision. It is the ratio of the absolute error of a measurement to the measurement being taken. In other words, this type of error is relative to the size of the item being measured.

$$\text{Relative true error } (\epsilon_t) = \frac{\text{True Error}}{\text{True Value}}$$

Example: let,

relative true error for $f(x) = 7e^{0.5x}$ at $f'(2)$

with $h = 0.3$

and $E_t = -0.722$

$\therefore$ Relative True Error, $\epsilon_t = \dfrac{\text{True Error}}{\text{True Value}}$

$$= \frac{-0.722}{9.5140} = +0.075888$$

as a percentage $\epsilon_t = -0.075888 \times 100\%$

$$= -7.5888\%$$

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Ans. no – 2

given that,

$$f(t) = e^{0.5t}$$

$$t = 4.5 \quad \text{and} \quad dt = 2.5$$

We know, $BDD = \dfrac{f(t) - f(t - \Delta t)}{\Delta t}$

$$= \frac{f(4.5) - f(4.5 - 2.5)}{2.5}$$

$$= \frac{e^{0.5 \times 4.5} - e^{0.5 \times 2}}{2.5}$$

$$= \frac{e^{2.25} - e^{1}}{2.5}$$

$$= \frac{9.49 - 2.71}{2.5}$$

$$= \frac{6.78}{2.5}$$

$$= 2.712$$

Ans. 2.712