

Practice Questions – Indicator Formulae

Based on the GBPAUD price data below, calculate the current values of the following technical indicators. [Note that Day 10 = today].

Make sure to write all formulae, show all workings.

- a. Tomorrow's Pivot Point values, plus S1, S2, S3, R1, R2 & R3 (to 4 DPs) *Marks [14]*
- b. Today's 9-day Momentum (to 2 decimal places) *Marks [2]*
- c. Today's 8-day Rate of Change (to 4 decimal places) *Marks [2]*
- d. Today's 9-day RSI (to 2 decimal places) *Marks [6]*
- e. Today's %D of a 5-3-3 Slow Stochastic (to 2 decimal places) *Marks [10]*
- f. Today's 8-day simple moving average (to 4 decimal places) *Marks [2]*
- g. Today's 5-day weighted moving average (to 4 decimal places) *Marks [4]*
- h. Today's 14-day exponential moving average (to 4 decimal places) *Marks [4]*

Time	t-9	t-8	t-7	t-6	t-5	t-4	t-3	t-2	t-1	t
Open	1.5726	1.5789	1.5814	1.5829	1.5873	1.5766	1.5788	1.5811	1.5839	1.5807
High	1.5818	1.5838	1.5845	1.5900	1.5873	1.5805	1.5839	1.5863	1.5880	1.5814
Low	1.5719	1.5784	1.5791	1.5805	1.5712	1.5730	1.5782	1.5800	1.5781	1.5696
Close	1.5795	1.5822	1.5828	1.5871	1.5765	1.5787	1.5814	1.5836	1.5807	1.5708
14 EMA	1.5695	1.5712	1.5728	1.5741	1.5748	1.5750	1.5764	1.5780	1.5784	-

P.T.O for answers...

Answers:

a. Tomorrow's Pivot Point values, plus S1, S2, S3, R1, R2 & R3

- $PP = (H + L + C) / 3 = (1.5814 + 1.5696 + 1.5708) / 3 = 1.5739$
- $S1 = (2 \times PP) - High = (2 \times 1.5739) - 1.5814 = 1.5665$
- $R1 = (2 \times PP) - Low = (2 \times 1.5739) - 1.5696 = 1.5783$
- $S2 = PP - (R1 - S1) = 1.5739 - (1.5783 - 1.5665) = 1.5621$
- $R2 = PP + (R1 - S1) = 1.5739 + (1.5783 - 1.5664) = 1.5857$
- $S3 = Low - 2(High - PP) = 1.5696 - 2(1.5814 - 1.5739) = 1.5547$
- $R3 = High + 2(PP - Low) = 1.5814 + 2(1.5739 - 1.5696) = 1.5901$

b. Today's 9-day Momentum

$$MOM(9) = \text{Price today} - \text{Price 9 days ago} = 1.5708 - 1.5795 = -0.0087$$

c. Today's 8-day Rate of Change (to 4 decimal places)

$$\begin{aligned} ROC(8) &= \frac{\text{Momentum}(8)}{\text{Price 8 days ago}} \times 100 = \frac{(1.5708 - 1.5822)}{1.5822} \times 100 \\ &= \frac{-0.0114}{1.5822} \times 100 = -0.72\% \end{aligned}$$

d. Today's 9-day RSI (to 2 decimal places)

$$\begin{aligned} RSI(9) &= \frac{\text{Points gained on UP days}}{\text{Total points gained \& lost}} \times 100 \\ &= \frac{147}{381} \times 100 = 38.58\% \end{aligned}$$

+	-
27	106
6	29
43	99
22	
27	
22	
147	234

e. Today's %D of a 5-3-3 Slow Stochastic (to 2 decimal places)

Percent Alert, $\%K_t = \frac{(C_t - L_5)}{(H_5 - L_5)} \times 100$

$$\%K_t = \frac{(C_t - L_5) \times 100}{(H_5 - L_5)} = \frac{(1.5708 - 1.5696) \times 100}{(1.5880 - 1.5696)} = \frac{12}{184} \times 100$$

$$\%K_{t-1} = \frac{(C_{t-1} - L_5) \times 100}{(H_5 - L_5)} = \frac{(1.5807 - 1.5712) \times 100}{(1.5880 - 1.5712)} = \frac{95}{168} \times 100$$

$$\%K_{t-2} = \frac{(C_{t-2} - L_5) \times 100}{(H_5 - L_5)} = \frac{(1.5836 - 1.5712) \times 100}{(1.5900 - 1.5712)} = \frac{124}{188} \times 100$$

$$\%D_t = \frac{3\text{-day sum of } (C - L_5) \times 100}{3\text{-day sum of } (H_5 - L_5)} = \frac{(12 + 95 + 124)}{(184 + 168 + 188)} \times 100 = \frac{231}{540} \times 100 = 42.78\%$$

f. Today's 8-day simple moving average (to 4 decimal places)

$$SMA(8) = \frac{C_{t-7} + C_{t-6} + \dots + C_{t-2} + C_{t-1} + C_t}{8}$$

$$SMA(8) = \frac{(1.5828 + 1.5871 + 1.5765 + 1.5787 + 1.5814 + 1.5836 + 1.5807 + 1.5708)}{8}$$

$$= \frac{12.6416}{8} = 1.5802$$

g. Today's 5-day weighted moving average (to 4 decimal places)

$$WMA(5) = \frac{C_{t-4} + 2C_{t-3} + 3C_{t-2} + 4C_{t-1} + 5C_t}{1 + 2 + 3 + 4 + 5}$$

$$WMA(5) = \frac{1.5787 + (2 \times 1.5814) + (3 \times 1.5836) + (4 \times 1.5807) + (5 \times 1.5708)}{1 + 2 + 3 + 4 + 5}$$

$$= \frac{1.5787 + 3.1628 + 4.7508 + 6.3228 + 7.8540}{15}$$

$$= \frac{23.6691}{15} = 1.5779$$

h. Today's 14-day exponential moving average (to 4 decimal places)

$$EMA_t = EMA_{t-1} + (C_t - EMA_{t-1}) \times \frac{2}{(n+1)}$$

$$n=14, \text{ so } EMA_t = 1.5784 + (1.5708 - 1.5784) \times 2/15$$

$$= 1.5784 - 0.0076 \times 2/15$$

$$= 1.5784 - 0.00101$$

$$= 1.5774$$