

MBBS First Professional Examination (Part-I)

BIOCHEMISTRY (PART-I)

Model Questions of OSPE

OBSERVED (3 Marks)

Question: Calculate the specific gravity of the given sample of urine when the room temperature is 40°C.

- Note the temperature on which the urinometer is calibrated and note the reading on the urinometer which is the observed specific gravity. (1.5 Marks)

Key: Suppose the given urinometer is calibrated for 16°C

- Calculate the temperature difference. (0.5 Mark)

Key: The temperature is $40 - 16 = 24$

- For every 3 degrees rise or fall in temperature 0.01 is added to or subtracted from the observed specific gravity. (0.5 Mark)

Key: $24/3 = 8$

Multiply it by 0.01

$0.01 \times 8 = 0.08$

- Calculate specific gravity of the given sample of urine. (0.5 Marks)

Key: Calculated specific gravity = Observed specific gravity + 0.08

NON-OBSERVED (2 Marks)

Question: Calculate pH by using Henderson-Hasselbalch equation when [salt]/[acid] ratio is 5:5 and pKa is 4.7.

$\text{pH} = \text{pKa} + \log [\text{salt}]/[\text{acid}]$ Henderson Hesselbach equation (1 mark)

$\text{pH} = 4.7 + \log 5/5$

$\text{pH} = 4.7 + \log 1$ (as $\log 1 = 0$)

$\text{pH} = 4.7 + 0$ (Hence $\text{pH} = \text{pKa}$)

$\text{pH} = 4.7$

(Result 1 mark)

Note: Log table or scientific calculator may be required.