Name: . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .

**Seminar 02: Kidney I**

**Student protocol**

**Urine specific gravity and osmolarity**

The specific gravity is determined using a refractometer.

The normal value of the specific gravity of human urine is 1.003 - 1.030.

Osmolarity can be determined by calculation.

Formula for calculating osmolarity: (specific gravity – 1) x 36 000 [mosm/l]

**Specific gravity measurement**

Determine the specific gravity of the urine samples using a refractometer and record in the table.

Calculate the probable osmolality of the samples and fill in the table.

Add the likely interpretation of the find to the individual samples in the table. For each sample, select one of the following options:

normal functioning kidneys

mild dehydration

diabetes insipidus

very high glucose level or sample contamination

the presence of other substances in the urine (e.g. glucose, bilirubin, leukocytes, blood, bacteria)

|  |  |  |  |
| --- | --- | --- | --- |
| Sample number | Specific gravity | Osmolarity | Interpretation of the find |
| 1 |  |  |  |
| 2 |  |  |  |
| 3 |  |  |  |
| 4 |  |  |  |
| 5 |  |  |  |

**Questions**

**1. From the list, write the substances that are filtered in the glomerulus and pass to the primary ultrafiltrate.**

Water, Na, K, amino acids, plasma proteins, leukocytes, erythrocytes, blood platelets, glucose, keto bodies, creatinine, urea, uric acid, pharmaceutical small molecules, pharmaceutical large molecules.

**Substances that are filtered:**

**2. What is the physiological composition of definitive urine?**

**3. Draw schematically the transport mechanisms that take place in the proximal tubule on the luminal and basolateral side.**

Lumen Proximal tubule cell Interstitium and capillary

Teacher's signature