Date Name			Group					
Lab report from the practical lesson on biochemistry								
Topic: Metabolism of calcium and phosphate. Osteoporosis								
Task 1: Estimation (Principle:	of inorganic	phosphate	in serum an	d urine				
Results:	Serum sample	Urine sample	Standard	Blank				
	(Tube No. 1)	(Tube No. 2)	(Tube No. 3)	(Tube No. 4)				
A 340 nm				-				
Calculations:								
Concentration of inorganic p	phosphate in seru	m (fS-P inorg.):						
fS-Inorganic phosphate (mr	mol/l) =	A _{serum} A _{standard}	× C _{standard}					
fS-Inorganic phosphate (mmo	ol/l) =		< =					
Concentration of inorganic	phosphate in urin	e (U-P inorg.):						
U- Inorganic phosphate (mi	$mol/l) = \frac{A_{urine}}{A_{standa}}$		_{lard} × Dilution of	urine				
U- Inorganic phosphate (mme			× =					
Daily output of inorganic photological du-Inorg. phosphate (mmo			ol/l) × Volume (of urine (liters/24 hrs)				
Prospilate (millo		5. L		(-100201 2 1 111 0)				
dU-Inorg. phosphate (mmol/2	24 hrs) =	×	=					

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Evaluate both serum phosphate and daily output of phosphate to urine.

Task 2: Estimation of total calcium in serum and urine **Principle**:

Results:

	Serum sample (Tube No. 1)	Urine sample (Tube No. 2)	Standard (Tube No. 3)	Blank (Tube No. 4)
A 650 nm				-

Calculations:

Concentration of total calcium in the serum (S-Ca):

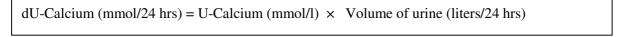
S-Calcium (mmol/l) =
$$\frac{A_{serum}}{A_{standard}} \times c_{standard}$$

Concentration of calcium in the urine (U-Calcium):

U- Calcium (mmol/l) =
$$A_{\text{urine}} \times c_{\text{standard}} \times \text{Dilution of urine}$$

$$A_{\text{standard}}$$

Daily ou	itput of	calcium	into	urine ((dU-	Calcium):
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dU-Calcium (mmol/24 hrs) = × =

Conclusion:

Evaluate both serum calcium and daily output of calcium to urine.

Task 3: Estimation of catalytic concentration of alkaline phosphatase and its isoforms

Principle:

What is chemistry of the ALP estimation? How is separate measurement of different isoenzymes achieved?

A. End-point assay with estimation of isoforms

Results and calculations:

	Native serum sample (S1)	Control for native sample (S2)	Heat-inactivated sample (T1)	Control for heat- inactivated (T2)
A 420 nm				

$$\Delta A_S = A_{S1} - A_{S2}$$

$$\Delta A_S = \dots - \dots = \dots$$

$$\Delta A_T = A_{T1} - A_{T2}$$

$$\Delta A_T = \dots - \dots = \dots$$

Total catalytic concentration of ALP:

Total ALP (
$$\mu kat/l$$
) = $\Delta A_S \times 10.263 = ... \times 10.263 = ...$

Catalytic concentration of the liver isoenzyme:

Liver isoenzyme ALP (
$$\mu$$
kat/I) = 1.5 × Δ A_T × 10.263 =

Catalytic concentration of the bone isoenzyme:

Bone isoenzyme ALP (
$$\mu$$
kat/l) = Total ALP (μ kat/l) – Liver isoenzyme ALP (μ kat/l)

B. Total ALP - kinetic assay

Results and calculations:

Measured absorbances: Difference per minute:

A_0											

A_1	 $\Delta A_1 = A_1 - A_0 = \dots$
A_2	 $\Delta A_2 = A_2 - A_1 = \dots$
A_3	 $\Delta A_3 = A_3 - A_2 = \dots$
A_4	 $\Delta A_4 = A_4 - A_3 = \dots$

$$A_5$$
 $\Delta A_5 = A_5 - A_4 = \dots$

Mean difference of absorbance per minute $\Delta A420/min$.:

Catalytic concentration ALP (μ kat/I) = Δ A420/min. \times 72.8 =

Conclusion:

Evaluate both total ALP and the proportion of both isoforms.

Task 4: Solubility Principle:	of various ca	lcium salts		
A. Solubility of calcium	n salts in water a	nd HCl		
	Tube No. 1 CaCl ₂	Tube No. 2 CaCO ₃	Tube No. 3 Ca ₃ (PO ₄) ₂	Tube No. 4 Ca ₃ (PO ₄) ₂ + Na ₂ EDTA
Solubility in water				
Solubility in HCl	-			
Solubility in NaHCO ₃	-	-		
B. Influence of some f	ood components o	on solubility of ca	alcium salts	
		No. 1 nonium oxalate	Tube No. 2 CaCl ₂ + Lactos	e
Result				

Conclusion: