

49. A patient has the following biochemical findings in the serum :

$\text{Na}^+ = 136 \text{ mmol/L}$ ,  $\text{K}^+ = 4.5 \text{ mmol/L}$ ,  $\text{HCO}_3^- = 10 \text{ mmol/L}$ ,  $\text{Cl}^- = 98 \text{ mmol/L}$

What is the anion gap in this patient ?

- A. 18 mmol/L
- B. 28 mmol/L
- C. 38 mmol/L
- D. 48 mmol/L
- E. 8 mmol/L

$$\begin{array}{r} 136 \\ - 98 \\ \hline 38 \\ 108 \end{array}$$
$$\begin{array}{r} 38 \\ - 10 \\ \hline 28 \end{array}$$

50. Which of the following criteria suggest prerenal azotemia?

- A. Urine osmolality = 300 mosmol/L. ✓
- B. Urine sodium = 5 mmol/L.
- C. Urine specific gravity = 1.012
- D. Plasma (BUN/creatinin) = 12/1 X
- E. None of the above.

51. A patient has the following biochemical findings in the serum :

$\text{pH} = 7.53$ ,  $\text{pO}_2 = 108 \text{ mmHg}$ ,  $\text{pCO}_2 = 24 \text{ mmHg}$ ,  $\text{HCO}_3^- = 24 \text{ mmol/L}$

These findings suggest what condition in this patient ?

- A. Repeated vomiting.
- B. Diabetic ketoacidosis
- C. Chronic bronchitis
- D. Renal tubular acidosis, type 1
- E. Psychogenic hyperventilation.

52. Aldosterone increases which of the following processes?

- A. Excretion of Phosphate.
- B. Excretion of water.
- C. Reabsorption of  $\text{K}^+$ .
- D. Excretion of  $\text{Na}^+$ .
- E. Excretion of  $\text{H}^+$ .

53. Diabetes insipidus can be caused by which of the following conditions?

- A. Hypocalcemia.
- B. Hyperkalemia.
- C. Hypernatremia.
- D. Hypocalcemia.
- E. Hypohatremia

54. What is the acid-base disorder that is caused by salicylate intoxication?

- A. Respiratory alkalosis and metabolic acidosis.
- B. Metabolic alkalosis and respiratory acidosis.
- C. Metabolic acidosis and respiratory acidosis.
- D. Respiratory acidosis and respiratory alkalosis.
- E. Respiratory acidosis only.

42. Regarding creatinine, which of the following statements is true?

- A. Most of the creatinine in urine comes from renal secretion.
- B. It is formed from hydration of creatine in muscles.
- C. It is a protein nitrogenous compound.
- ☒ D. It is not reabsorbed by renal tubules.
- E. None of the above.

43. Chronic renal failure is characterized by which of the following biochemical findings?

- A. Hypophosphatemia.
- ☒ B. Decreased serum bicarbonate.
- C. Increased activity of  $1-\alpha$  hydroxylase.
- D. Hypernatremia.
- E. None of the above.

44. Diabetes insipidus can be caused by which of the following conditions?

- ☒ A. Hypocalcemia.
- B. Hyperkalemia.
- C. Hypernatremia.
- D. Hypokalemia.
- E. Hypornatremia.

45. Which of the following is the normal amount of urea excreted in urine daily?

- A. 5-15 mg.
- B. 45-60 mg.
- C. 50-70 g.
- D. 5-10-g.
- ☒ E. 20-30 g.

46. Which of the following urinary casts is seen in chronic renal failure?

- A. Hyaline casts.
- B. White blood cell casts.
- ☒ C. Waxy casts.
- D. Fatty casts.
- E. Granular casts.

47. Which of the following is the normal range for serum urea concentration?

- A. 5-10 mg/dl.
- B. 45-60 mg/dl.
- C. 55-70 mg/dl.
- D. 5-15-mg/dl.
- ☒ E. 20-40 mg/dl.

48. Which of the following urinary casts is characteristically seen in pyelonephritis?

- A. Hyaline casts.
- ☒ B. White blood cell casts.
- C. Waxy casts.
- D. Fatty casts.
- E. All of the above.

18. A patient has the following biochemical findings in the plasma :  
decreased total calcium , increased phosphate , normal alkaline phosphate (ALP),  
increased parathormone (PTH) level.

What is the most likely diagnosis in this patient ?

- A. Osteomalacia.
- B. Hypoparathyroidism.
- C. Paget's disease of bone.
- D. Bone metastases.
- E. Pseudohypoparathyroidism.

19. In adults , jaundice begins to become clinically apparent when serum bilirubin level exceeds which of the following values ?

- A. 2.5 mg/dl.
- B. 3.5 mg/dl.
- C. 4.5 mg/dl.
- D. 5.5 mg/dl.
- E. 6.5 mg/dl.

20. Which of the following lab findings is found in obstructive jaundice?

- A. Urobilinogen is increased in urine.
- B. Serum ALT is greatly increased.
- C. Bilirubin is positive in urine.
- D. Serum alkaline phosphatase is normal.
- E. All of the above

21. Which of the following blood tests reflects the synthetic function of hepatocytes ?

- A.  $\gamma$ -globulins.
- B. Alanine amino transferase (ALT).
- C. Alkaline phosphatase (ALP).
- D. Prothrombin time (PT).
- E. All of the above.

22. Unconjugated hyperbilirubinemia with normal ALT is found in which of the following conditions?

- A. Gilbert's syndrome.
- B. Acute hepatitis.
- C. Common bile duct stone.
- D. Pancreatic carcinoma.
- E. None of the above.

23. A patient has the following biochemical findings in the plasma :

Total calcium is increased , phosphate is increased, PTH level is decreased.

Which of the following is the most likely diagnosis in this patient ?

- A. Vitamin D intoxication.
- B. Primary hyperparathyroidism.
- C. Secondary hyperparathyroidism.
- D. PTH-rp secreting squamous cell carcinoma.
- E. Osteomalacia.

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6. A patient has a blood urea nitrogen of 10 mg/dl. What is the serum urea concentration in this patient?

- A. 16.4 mg/dl.
- B. 18.4 mg/dl.
- C. 11.4 mg/dl.
- ☒ D. 21.4 mg/dl.
- E. 14.4 mg/dl.

7. ECG changes due to hyperkalemia include which of the following?

- A. ST segment elevation.
- B. Tall P wave.
- C. Flattening of T wave.
- ☒ D. Widened QRS complex.
- E. All of the above.

8. A patient has the following biochemical findings in the plasma :  
increased total calcium , decreased phosphate , increased alkaline phosphatase (ALP)  
activity, increased parathormone (PTH) level.

What is the most likely diagnosis in this patient?

- A. Milk-alkali syndrome.
- ☒ B. Primary hyperparathyroidism.
- C. Paget's disease of bones.
- D. Bone malignant metastases.
- E. All of the above.

9. Hypocalcaemia can be found in which of the following conditions?

- A. Primary hyperparathyroidism.
- B. Sarcoidosis.
- ☒ C. Acute pancreatitis.
- D. Thiazide diuretics use.
- E. All of the above.

10. Regarding ADH , which of the following statements is true?

- A. It decreases the urine osmolality.
- B. It is produced in posterior pituitary gland.
- ☒ C. It is secreted when plasma osmolality is increased.
- D. It increases water reabsorption from proximal renal tubules.
- E. All of the above.

11. Which of the following is the normal range for specific gravity of the first morning urine sample?

- A. 1.025-1.030.
- B. 1.005-1.010.
- ☒ C. 1.015-1.025.
- D. 1.001-1.005.
- E. 1.035-1.040.

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12. Plasma osmolality is decreased in which of the following conditions?

- ☒ A. SIADH.
- B. Water depletion.
- C. Diabetic ketoacidosis.
- D. Untreated diabetes insipidus.
- E. All of the above.

13. Which of the followings is the normal concentration of inorganic phosphate in serum?

- A. 1.5-2.5 mg/dl.
- B. 4.5-5.5 mg/dl.
- C. 3.5-5.5 mg/dl.
- ☒ D. 2.5-4.5 mg/dl.
- E. None of the above.

14. A person has the following serological markers of HBV results:

HBsAg: Positive

Anti-HBc antibodies (IgM): Negative

Anti-HBc antibodies (IgG): Positive

Anti-HBs antibodies: Negative

These lab findings are most consistent with which of the following?

- A. Immunity against HBV due to past vaccination.
- B. Immunity against HBV due to past natural infection.
- C. Acute HBV hepatitis.
- ☒ D. Chronic HBV hepatitis.
- E. None of the above.

15. Regarding hyperkalemia, which of the following statements is true?

- A. It is associated with metabolic alkalosis.
- B. It occurs in hyperaldosteronism.
- C. It can occur in repeated vomiting.
- ☒ D. It can be treated with insulin infusion.
- E. All of the above.

16. A patient has the following lab results in the serum:

sodium 140 mmol/l, BUN 28 mg/dl, glucose 180 mg/dl. What is the calculated serum osmolality in this patient?

- A. 260 mosmol/kg water.
- B. 270 mosmol/kg water.
- C. 280 mosmol/kg water.
- D. 290 mosmol/kg water.
- ☒ E. 300 mosmol/kg water.

17. Regarding microalbuminuria, which of the following statements is?

- ☒ A. It is defined as urinary protein of more than 300 mg/dl.
- B. It can be prevented by administration of thiazide diuretics.
- C. It can be detected by urinary dipsticks.
- D. It is defined as a proteinuria between 20 and 200 mg/minute.
- E. None of the above.

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24. Hereditary vitamin D- dependent rickets, type 1 is characterized by which of the following?

- A. It is an autosomal dominant disease.
- B. Raised serum levels of calcitriol.
- ☒ C. Decreased activity of 1- $\alpha$  hydroxylase.
- D. Hypocalcemia and hyperphosphatemia
- E. None of the above.

25. Which of the following lab findings is found in hemolytic jaundice?

- A. Serum conjugated bilirubin is greatly increased.
- ☒ B. Serum alkaline phosphatase is normal.
- C. Bilirubin is positive in urine.
- D. Serum ALT is greatly increased.
- E. None of the above.

26. A very high serum ALT with slightly increased ALP is most consistent with which of the following diseases?

- ☒ A. Acute viral hepatitis.
- B. Gilbert's syndrome.
- C. Common bile duct stone.
- D. Chronic viral hepatitis.
- E. All of the above.

27. Hereditary hemochromatosis is characterized by which of the following laboratory findings?

- A. Serum iron is normal, TIBC is increased.
- B. Serum iron is decreased, TIBC is increased.
- ☒ C. Serum iron is increased, TIBC is decreased.
- D. Serum iron is increased, TIBC is increased.
- E. Serum iron is decreased, TIBC is decreased.

28. In heme catabolism, biliverdin is converted to bilirubine in reticuloendothelial cells by which of the following processes?

- A. Carboxylation.
- B. Oxidation.
- C. Conjugation.
- D. Hydration.
- ☒ E. Reduction.

29. Which of the following is the normal range for the renal clearance of creatinine in men?

- A. 20-60 ml/minute.
- B. 140-280 ml/minute.
- C. 40-90 ml/minute..
- ☒ D. 90-125 ml/minute.
- E. 20-40 ml/minute.

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35. An alkaline urine can be found in which of the following conditions?

- A. Diabetic Ketoacidosis.
- B.  $\text{NH}_4\text{Cl}$  ingestion.
- C. Gout
- ☒ D. Type I distal renal tubular acidosis.
- E. None of the above.

36. Regarding liver function tests, which of the following statements is true?

- A. AST is more specific for liver disease than ALT
- B. Raised serum AST is highly specific for cholestasis.
- C. Raised serum ALP indicates hepatocellular injury.
- D. Low serum albumin indicates increased hepatic synthetic function.
- ☒ E. None of the above.

37. Creatinine clearance is increased in which of the following conditions?

- A. Dehydration.
- ☒ B. Normal pregnancy.
- C. Renal failure.
- D. Shock.
- E. Advanced age.

38. Regarding calcium, which of the following statements is true?

- A. About 50% of plasma calcium is bound as complexes with phosphate.
- B. Most of calcium in the body is found in cartilage and muscles.
- ☒ C. Serum free calcium is increased in acidosis.
- D. Normal serum concentration is 8.5-10.5 mmol/L.
- E. All of the above.

39. Hyponatremia can be found in which of the following conditions?

- A. Primary adrenal failure.
- B. Repeated vomitings.
- C. SIADH.
- D. Chronic diarrhea.
- ☒ E. All of the above.

40. Which of the following urine crystals is associated with an alkaline urine?

- A. Calcium oxalate crystals.
- ☒ B. Triple phosphate crystals.
- C. Cystine crystals.
- D. Uric acid crystals.
- E. All of the above.

41. Hereditary vitamin D- dependent rickets, type 2 is characterized by which of the following?

- A. It is an autosomal dominant disease.
- B. Raised serum levels of calcitriol.
- C. Decreased activity of 1- $\alpha$  hydroxylase.
- D. Hypocalcemia and hyperphosphatemia
- ☒ E. None of the above.

- Answer the following questions (only ONE CORRECT answer for each question):

1.Regarding urea , which of the following statements is true?

- A.Serum urea concentration is slightly affected by dietary proteins.
- B.Its renal clearance is more reliable index of GFR than creatinine renal clearance..
- C.Serum urea concentration is decreased in acute renal failure.
- ☒ D.It is partly reabsorbed by renal tubules.
- E.None of the above.

2.Tumor lysis syndrome is characterized by which of the following biochemical findings?

- A.Hypokalemia.
- B.Hypercalcemia.
- ☒ C.Hyperuricemia.
- D.Hypophosphatemia
- E.All of the above.

3.Chronic hypocalcemia can lead to which of the following ?

- ☒ A.Basal ganglia calcifications.
- B.Shortened QT interval in ECG.
- C.Corneal calcification.
- D.Renal stones.
- E.None of the above.

4.An infant has the following biochemical findings in the serum :

pH = 7.54 , pO<sub>2</sub> = 80 mmHg, pCO<sub>2</sub> = 46 mmHg, HCO<sub>3</sub><sup>-</sup> =37.5 mmol/L

These findings suggest what condition in this patient ?

- A.Repeated vomiting.
- B.Acute diarrhea.
- C.Renal tubular acidosis,type2.
- ☒ D.Renal tubular acidosis,type1.
- E.Fanconi syndrome.

5.Which of the following tests is used to assess the renal tubular functions ?

- A.Measurement of urine osmolality.
- B.Water deprivation test .
- C.Urine acidification test .
- D.Urine dilution test .
- ☒ E.All of the above.

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55. Regarding prothrombin time (PT) , which of the following statements is true ?

- A. It reflects the activity of the clotting factors XII and XI.
- B. It normally ranges from 11 to 13 seconds.
- C. It is decreased in hepatic failure.
- D. It is decreased in prolonged cholestasis.
- ☒ E. All of the above.

56. Regarding nephrogenic diabetes insipidus , which of the following statements is true ?

- A. Plasma ADH level is low.
- B. It is associated with glycosuria.
- C. Urine osmolality is high.
- ☒ D. Plasma osmolality can be high.
- E. None of the above.

57. SIADH syndrome is characterized by all the followings , EXCEPT:

- A. Normal adrenal function.
- B. Normal renal function.
- C. Increased urine osmolality.
- D. Decreased plasma osmolality.
- ☒ E. Decreased urine sodium concentration.

58. The normal kidney carries out all the following functions , EXCEPT:

- A. Secretion of erythropoietin.
- B. Production of local prostaglandins.
- ☒ C. Hydroxylation of 1-OH-VITD3.
- D. Production of renin.
- E. Regulation of blood PH.

59. Hypokalemia can be found in all the following conditions , EXCEPT:

- A. Insulin administration.
- ☒ B. Hypoaldosteronism.
- C. Prolonged vomiting.
- D. Cushing's syndrome.
- E. Diarrhea.

60. Hyponatremia can be found in all the following conditions , EXCEPT :

- A. Chronic diarrhea.
- ☒ B. Diabetes insipidus.
- C. Acute renal failure.
- D. Prolonged vomiting.
- E. Primary adrenal failure.

- 90- *misread*!
- A-Primary adrenal failure.
  - B-Repeated vomiting.
  - C-SIADH.
  - D-Chronic diarrhea.
  - E-All of the above.

51. The normal specific gravity of the first morning urine sample is :

- A-1.001-1.005
- B-1.005-1.010
- C-1.010-1.015
- D-1.015-1.025
- E-1.035-1.040

52-Which of the following thyroid function tests is present in serum in high titers in the vast majority of patients with Graves' disease ?

- A-Calcitonin.
- B-ANA.
- C-Anti-TSHR-abs.
- D-Anti-TPO abs.
- E-ASMA

53.Regarding microalbuminuria , all of the following statements are true, EXCEPT:

- A-It is an important predictor for the future development of diabetic nephropathy .
- B-It is defined as a proteinuria between 20 and 200 mcg /minute.
- C-It can not be detected by urinary dipsticks.
- D-Can be prevented by administration of ACE inhibitors.
- E It is defined as urinary protein of more than 300 mg/dl.

54.Risk factors for urinary tract stone formation include all of the following , EXCEPT:

- A-Hypercalciuria
- B-Hyperoxaluria
- C-Hypercitraturia
- D-Cystinuria
- E-Hyperuricosuria

55.Glycosuria associated with hyperglycemia can be found in all the following conditions , EXCEPT:

- A-Renal glycosuria.
- B-Diabetes mellitus.
- C-Cushing's syndrome.
- D-Acromegaly.
- E-Chronic pancreatitis.

56.Causes of hyponatremia include all the following conditions , EXCEPT:

- A-Chronic diarrhea.
- B-Diabetes insipidus.
- C-Primary hypothyroidism.
- D-Prolonged vomiting.
- E-Primary adrenal failure.

57.SIADH syndrome is characterized by all the following , EXCEPT:

- A-Increased sodium concentration in urine.



57- SIADH, EXCEPT

- B-Normal renal function.
- C-Decreased urine osmolality.
- D-Decreased plasma osmolality.
- E-Normal adrenal function.

58. The normal kidney carries out all the following functions, EXCEPT:

- A-Secretes erythropoietin.
- B-Produces local prostaglandins.
- C-Hydroxylates 25-OH-VITD3.
- D-Produces angiotensinogen.
- E-Regulates blood PH.

59. Fanconi's syndrome is characterized by all following, EXCEPT:

- A-Distal RTA.
- B-glycosuria.
- C-Hyperphosphaturia.
- D-Aminoaciduria.
- E-Hypophosphatemia.

60. Causes of hypokalemia include all the following conditions, EXCEPT:

- A-Prolonged vomiting.
- B-Hyperaldosteronism.
- C-Primary adrenal failure
- D-Cushing's syndrome.
- E-Diarrhea

Match items in column A with MOST suitable items in column B :

Column A	Column B
<u>A</u> 61. Serum (BUN/ creatinine) = 10/1.	A-Pre-renal azotemia
<u>A</u> 62. Na concentration in urine = 60 mmol/L.	B-Acute tubular necrosis
<u>A</u> 63. Urine osmolality = 330 mosmol/kg.	C-Both of them.
<u>C</u> 64. Oliguria.	D-Neither of them.
<u>C</u> 65. Plasma osmolality may be normal.	A-Central (cranial) diabetes insipidus.
<u>B</u> 66. Plasma ADH level is high.	B-Nephrogenic diabetes insipidus.
<u>C</u> 67. Urine osmolality is low.	C-Both of them.
<u>A</u> 68. Plasma ADH level is <u>low</u> .	D-Neither of them.
<u>B</u> 69. Increased plasma <u>calcitonin</u> .	A-MEN type I.



57- SIADH, EXCEPT

- B-Normal renal function.
- ☒ C-Decreased urine osmolality.
- D-Decreased plasma osmolality.
- E-Normal adrenal function.

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- A-Secretes erythropoietin.
- B-Produces local prostaglandins.
- C-Hydroxylates 25-OH-VITD3.
- ☒ D-Produces angiotensinogen.
- E-Regulates blood PH.

59. Fanconi's syndrome is characterized by all following, EXCEPT:

- A-Distal RTA.
- B-glycosuria.
- C-Hyperphosphaturia.
- D-Aminoaciduria.
- E-Hypophosphatemia.

60. Causes of hypokalemia include all the following conditions, EXCEPT:

- A-Prolonged vomiting.
- B-Hyperaldosteronism.
- ☒ C-Primary adrenal failure
- D-Cushing's syndrome.
- E-Diarrhea

Match items in column A with MOST suitable items in column B :

Column A	Column B
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<input checked="" type="radio"/> C 64. Oliguria.	D-Neither of them.
<input checked="" type="radio"/> C 65. Plasma osmolality may be normal.	A-Central (cranial ) diabetes insipidus.
<input checked="" type="radio"/> B 66. Plasma ADH level is high.	B-Nephrogenic diabetes insipidus.
<input checked="" type="radio"/> C 67. Urine osmolality is low.	C-Both of them.
<input checked="" type="radio"/> A 68. Plasma ADH level is high.	D-Neither of them.
<input checked="" type="radio"/> B 69. Increased plasma calcitonin.	A-MEN type I.



43. HBsAg: Positive.

Anti-HBc antibodies (IgM): Negative.

Anti-HBc antibodies (IgG): Positive.

Anti-HBs antibodies: Negative.

These lab findings are most consistent with:

- A-Immunity against HBV due to past vaccination.
- B-Immunity against HBV due to past natural infection.
- C-Chronic HBV hepatitis.
- D-Acute HBV hepatitis.
- E-None of the above.

44. Wilson disease is characterized by which of the following?

- A-Increased copper reabsorption from the kidney
- B-Raised serum levels of ceruloplasmin
- C-Raised urinary levels of free copper
- D-Raised serum levels of total copper
- E-All of the above

45. Which of the following autoantibodies is present in serum in high titers in the vast majority of patients with primary biliary cirrhosis?

- A-Anti mitochondrial antibodies (AMA).
- B-Anti nuclear antibodies (ANA).
- C-Anti-smooth muscle antibodies (ASMA).
- D-Anti-ALP antibodies.
- E-All of the above

46. The normal concentration of inorganic phosphate in serum is:

- A-2.5 - 4.5 mg/dl.
- B-1.5 - 2.5 mg/dl.
- C-3.5 - 5.5 mg/dl.
- D-4.5 - 6.5 mg/dl.
- E-None of the above.

47. Chronic hypocalcemia can lead to which of the following?

- A-Basal ganglia calcifications.
- B-Shortened QT interval in ECG.
- C-Corneal calcification.
- D-Renal stones.
- E-None of the above.

48. Which of the following serum thyroid function tests can be used as a tumor marker for papillary thyroid cancer?

- A-Thyroglobulin (Tg).
- B-Anti-Tg abs.
- C-Anti-TSHR-abs.
- D-Anti-TPO abs.
- E-Calcitonin.

49. Which of the following causes a decrease in serum TBG level:

- A-Pregnancy.
- B-Estrogens.
- C-Biliary liver cirrhosis.
- D-Acute intermittent porphyria.
- E-Glucocorticoids.

50. Hyponatremia can be found in which of the following cases?



- 37 -  
A-Diabetic ketoacidosis.  
B-Gout.  
C-Acetazolamide ingestion.  
D-Starvation.  
E-NH<sub>4</sub>Cl ingestion.

38. A patient has the following biochemical findings in the plasma :  
Total calcium is increased , phosphate is increased, PTH level is decreased.  
The most likely diagnosis in this patient is :

- A-PTH-rp secreting squamous cell carcinoma.  
B-Primary hyperparathyroidism.  
C-Secondary hyperparathyroidism.  
D-Vitamin D intoxication.  
E-Osteomalacia.

39. Regarding liver function tests , which of the following statements is true?

- A-AST is more specific for liver disease than ALT.  
B-Raised serum GPT is highly specific for cholestasis.  
C-Raised serum ALP indicates hepatocellular injury.  
D-Low serum albumin always indicates decreased hepatic synthetic function.  
E-None of the above.

40. A person has the following serological markers of HBV results :

- HBsAg : Negative  
Anti-HBc antibodies (IgM): Negative  
Anti-HBc antibodies (IgG): Positive  
Anti-HBs antibodies: Positive

These lab findings are most consistent with:

- A-Immunity against HBV due to past vaccination. → N-N-N-P  
B-Immunity against HBV due to past natural infection.  
C-Chronic HBV hepatitis.  
D-Acute HBV hepatitis.  
E-None of the above.

41. Which of the following blood tests reflects the synthetic function of hepatocytes ?

- A-γ-globulins.  
B-Prothrombin time.  
C-Alkaline phosphatase.  
D-Gamma glutamyl transferase.  
E-Alanine amino transferase.

42. Hereditary hemochromatosis is characterized by which of the following laboratory findings ?

- A-Serum iron is increased , TIBC is increased.  
B-Serum iron is decreased , TIBC is increased.  
C-Serum iron is normal , TIBC is increased.  
D-Serum iron is decreased , TIBC is decreased.  
E-Serum iron is increased , TIBC is decreased.

43. A person has the following serological markers of HBV results :



22. Aldosterone increases:

- A-Excretion of Phosphate.
- B-Excretion of water.
- C-Reabsorption of  $H^+$ .
- D-Excretion of  $Na^+$ .
- E-Excretion of  $K^+$ .

23. Regarding ADH, which of the following statements is true?

- A-It increases water reabsorption from proximal renal tubules.
- B-It is stored in anterior pituitary gland.
- C-Is secreted when plasma osmolality is increased.
- D-It decreases the urine osmolality.
- E-It increases the plasma osmolality.

24. Which of the following renal stones is associated with an alkaline urine?

- A-Calcium oxalate stones.
- B-Uric acid stones.
- C-Cystine stones.
- D-Triple phosphate stones.
- E-All of the above.

25. ECG changes due to hyperkalemia include which of the following?

- A-Broad QRS complex.
- B-Tall P wave.
- C-Flattening of T wave.
- D-ST segment elevation.
- E-All of the above.

26. Which of the following lab findings is found in obstructive jaundice?

- A-Urobilinogen is decreased in urine.
- B-Serum ALT is greatly increased.
- C-Bilirubin is negative in urine.
- D-Serum alkaline phosphatase is normal.
- E-Serum indirect bilirubin is greatly increased.

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27. Regarding creatinine, which of the following statements is true?

- A-Most of the filtrated creatinin is secreted by renal tubules.
- B-It is formed from hydration of creatine.
- C-It is a protein nitrogenous compound.
- D-It is not reabsorbed by renal tubules.
- E-It is synthesized in the liver.

28. A very high serum ALT with slightly increased ALP is most consistent with:

- A-Chronic viral hepatitis.
- B-Physiological jaundice.
- C-Common bile duct stone.
- D-Acute viral hepatitis.
- E-Gilbert's syndrome.

29. In adults, jaundice begins to become clinically apparent when serum bilirubine level exceeds:

- A-6.5 mg/dl.
- B-4.5 mg/dl.
- C-5.5 mg/dl.
- D-2.5 mg/dl.
- E-7.5 mg/dl.

30. Which of the following blood serum tests reflects the synthetic function of



hepatocytes ?

- A-Alanine aminotransferase (ALT).
- B-Gamma glutamyl transferase (GGT).
- C-Alkaline phosphatase (ALP).
- D-Albumin.
- E- $\gamma$ -globulins.

31. In heme catabolism, biliverdin is converted to bilirubine in reticuloendothelial cells by the process of :

- A-Reduction.
- B-Oxidation.
- C-Conjugation.
- D-Hydration.
- E-Dehydration.

32. A person has the following serological markers of HBV results :

- HBsAg : Positive
- Anti-HBc antibodies (IgM) : Positive
- Anti-HBc antibodies (IgG) : Negative
- Anti-HBs antibodies : Negative

These lab findings are most consistent with:

- A-Immunity against HBV due to past vaccination.
- B-Acute HBV hepatitis.
- C-Chronic HBV hepatitis.
- D-Immunity against HBV due to past natural infection.
- E-None of the above.

33. Renin- angiotensin -aldosterone system is activated in which of following conditions ?

- A-Severe diarrhea.
- B-Liver cirrhosis with ascites
- C-Congestive heart failure
- D-Nephrotic syndrome
- E-All of the above

34. Unconjugated hyperbilirubinemia with normal ALP is found in :

- A-Gilbert's syndrome.
- B-Pancreatic cancer.
- C-Common bile duct stone.
- D-Sclerosing cholangitis.
- E-All of the above.

35. Regarding calcium, which of the following statements is true ?

- A-Both ionic and non-ionic fractions are physiologically active.
- B-Plasma level is regulated only by PTH.
- C-Intestinal absorption is ~~regulated by PTH~~ *noted* C- Some free calcium is decreased in *acidosis*
- D-Plasma level is increased by calcitonin.
- E-None of the above.

36. Which of the following lab findings is found in hemolytic jaundice ?

- A-Serum direct bilirubin is greatly increased.
- B-Serum alkaline phosphatase is increased.
- C-Bilirubin is positive in urine.
- D-Serum ALT is greatly increased.
- E-Urobilinogen in urine is increased.

37. Alkaline urine can be found in which of the following conditions ?

14. Hypertension is

- A-Conn's disease.
- B-Repeated vomiting
- C-Diarrhea
- D-Cushing's syndrome
- E-Renal failure

15. Hypophosphataemia is found in :

- A-Alcoholism, ~~trick~~ rickets
- B-Hypoparathyroidism.
- C-Renal failure
- D-Pseudohypoparathyroidism.
- E-Tumor lysis syndrome

16. Hypocalcaemia can be found in :

- A-Acute pancreatitis.
- B-Sarcoidosis.
- C-Thiazide diuretics use.
- D-Primary hyperparathyroidism.
- E-All of the above.

17. The tests used to assess the renal tubular functions include :

- A-Measurement of urine specific gravity .
- B-Water deprivation test .
- C-Urine acidification test .
- D-Urine dilution test .
- E-All of the above.

18. The normal range of serum urea concentration is :

- A-5-10 mg/dl.
- B-45-60 mg/dl.
- C-50-70 mg/dl .
- D-5-15 mg/dl .
- E-20-40 mg/dl.

19. An alkaline urine can be found in which of the following conditions ?

- A-Diabetic Ketoacidosis.
- B- NH<sub>4</sub>Cl ingestion.
- C-Distal Renal Tubular Acidosis, type I.
- D-Cystinuria .
- E-Gout.

20. Regarding hyperkalemia , which of the following statements is true ?

- A-It may be treated with glucose and insulin infusion .
- B-It occurs in hyperaldosteronism.
- C-It can occur in repeated vomiting.
- D-It is associated with metabolic alkalosis.
- E-All of the above.

21. Hypophosphataemia can be found in :

- A-Hypoparathyroidism.
- B-Osteomalacia .
- C-Tumor lysis syndrome .
- D-Renal failure.
- E-Pseudohypoparathyroidism.

22. Aldosterone increases which of the following processes? →



6- PTH

- A-It increases reabsorption of phosphate from renal tubules.
- B-Its plasma level is high in patients with chronic renal failure.
- C-It inhibits renal 1- $\alpha$  hydroxylase.
- D-It decreases reabsorption of calcium from renal tubules.
- E-None of the above.

7. Regarding Renin, which of the following statements is true?

- A-It is synthesized by distal tubule epithelial cells.
- B-It converts angiotensin I to angiotensin II.
- C-It inhibits aldosterone secretion from adrenal cortex.
- D-Its plasma concentration is decreased in patients with nephrotic syndrome.
- E-Its secretion is stimulated when plasma sodium level is decreased.

8. Ketone bodies are produced in:

- A-Skeletal muscles.
- B-Brain.
- C-Adipocytes.
- D-Liver.
- E-All of the above.

9. Regarding urea, which of the following statements is true?

- A-Serum urea concentration is greatly affected by dietary proteins.
- B-It is synthesized primarily in the kidneys.
- C-Serum urea concentration is decreased in renal failure.
- D-It is not reabsorbed by renal tubules.
- E-Its renal clearance is more reliable index of GFR than creatinine renal clearance.

10. A patient has the following biochemical findings in the plasma:

Total calcium: increased, phosphate: decreased, ALP level is increased, PTH level is increased. The most likely diagnosis in this patient is:

- A-Milk-alkali syndrome
- B-Osteomalacia
- C-Paget's disease of bones.
- D-Bone malignant metastases.
- E-Primary hyperparathyroidism.

11. Blood test in urine is positive in which of the following conditions?

- A-Hemoglobinuria.
- B-Myoglobinuria.
- C-Hematuria.
- D-Rhabdomyolysis.
- E-All of the above.

12. Regarding calcium, which of the following statements is true?

- A-45% of plasma calcium is bound as complexes with bicarbonate.
- B-Serum free calcium is decreased in alkalosis.
- C-Normal serum concentration is 8.5-10.5 mmol/L.
- D-Most of calcium in the body is found in the soft tissue.
- E-All of the above.

13. Which of the following renal stones is usually associated with urinary tract infection with Proteus?

- A-Triple phosphate stones.
- B-Uric acid stones.
- C-Cystine stones.
- D-Calcium oxalate stones.
- E-All of the above.

14. Hyperkalemia can be found in which of the following conditions?

Answer the following questions (only ONE CORRECT answer for each question) :

1-Regarding thyroid hormones, which of the following statements is true ?

- A-T3 is produced from the thyroid gland in excess of T4.
- B-Both T4 and T3 bind to membrane receptors on the target cells.
- C-T3 is more potent than T4.
- D-Stored T4 and T3 are released from TBG.
- E-All of the above.

2-A patient has high serum TSH level, normal fT4, normal fT3. which of the following cases is most likely in this patient ?

- A-Graves' disease.
- B-T3 thyrotoxicosis.
- C-Secondary hypothyroidism.
- D-Subclinical primary hypothyroidism.
- E-Secondary hyperthyroidism.

3.Creatinine clearance is increased in which of the following conditions ?

- A-Dehydration.
- B-Shock.
- C-Renal failure.
- D-Normal pregnancy.
- E-Advanced age.

4.Sterile pyuria can be found in :

- A-Partially treated cystitis.
- B-Renal tuberculosis.
- C-Renal transplant rejection.
- D-Papillary necrosis.
- E-All of the above.

5.Plasma osmolality is decreased in which of the following conditions?

- A-SIADH.
- B-Water depletion.
- C-Diabetic ketoacidosis (DKA)
- D>Uncompensated diabetes insipidus.
- E-Ethanol intoxication.

6.Regarding PTH, which of the following statements is true?



**50. The normal kidney carries out all the following functions, EXCEPT:**

- A-Secretes erythropoietin  
B-Produces local prostaglandins  
C-Hydroxylates 25-OH-VITD3  
D-Produces angiotensinogen  
E-Regulates blood PH

**51. Fanconi's syndrome is characterized by all following, EXCEPT:**

- A-Distal RTA  
B-glycosuria  
C-Hyperphosphaturia  
D-Aminoaciduria  
E-Hypophosphatemia

**52. Causes of hypokalemia include all the following conditions, EXCEPT:**

- A-Prolonged vomiting  
B-Hyperaldosteronism  
C-Primary adrenal failure  
D-Cushing's syndrome  
E-Diarrhea

**53. Regarding microalbuminuria, all of the following statements are true, EXCEPT:**

- A-It is an important predictor for the future development of diabetic nephropathy.  
B-It is defined as a proteinuria between 20 and 200 mcg /minute.  
C-It can not be detected by urinary dipsticks.  
D-Can be prevented by administration of ACE inhibitors.  
E-It is defined as urinary protein of more than 300 mg/dl

**54. Glycosuria associated with hyperglycemia can be found in all the following conditions, EXCEPT:**

- A-Renal glycosuria  
B-Diabetes mellitus  
C-Cushing's syndrome  
D-Acromegaly  
E-Chronic pancreatitis

**55. Causes of Hyponatremia include all the following conditions, EXCEPT:**

- A-Diarrhea  
B-Diabetes insipidus  
C-Primary hypothyroidism  
D-Prolonged vomiting  
E-Primary adrenal failure

● Match items in column A with MOST suitable items in column B :

column A	column B
56. (BUN/ creatinine ) = 10/1	A-Pre-renal azotemia
57. Na concentration in urine = 60 mmol/L	B-ATN
58. Urine osmolality = 330 mosmol/kg	C-Both of them
59. Urine volume is low	D-Neither of them
60. Plasma osmolality may be normal	A-Central (cranial ) diabetes insipidus
61. Plasma ADH level is low	B-Nephrogenic diabetes insipidus
62. Urine osmolality is high	C-Both of them



**38. Regarding hyperkalemia, which of the following statements is true?**

- ☒ A-It may be treated with glucose and insulin infusion. B-Occurs in hyperaldosteronism  
C-It can occur in repeated vomiting. D-It is associated with alkalosis  
E-All of the above.

**39. Plasma osmolality is decreased in which of the following conditions?**

- ☒ A-Postoperative states B-Water depletion C-DKA D-Untreated diabetes insipidus  
E-Ethanol intoxication

**40. Normal range of serum urea concentration is:**

- A-4-8 mg/dl B-2-4 mg/dl C-10-20 mg/dl D-8-16 mg/dl  
☒ E-20-40 mg/dl

**41. Blood test in urine is positive in which of the following conditions?**

- A-Hemoglobinuria B-Myoglobinuria C-Hematuria  
D-Rhabdomyolysis ☒ E-All of the above

**42. Ketonuria can be found in which of the following conditions?**

- A-Diabetes mellitus B-Pregnancy C-Prolonged fasting D-Toxemia of pregnancy  
☒ E-All of the above.

**43. Which of the following renal stones is usually associated with urinary tract infection with Proteus?**

- ☒ A-Triple phosphate stones B-Uric acid stones C-Cystine stones  
D-Calcium oxalate stones E-All of the above

**44. Alkaline urine can be found in which of the following conditions?**

- A-DKA B-Gout ☒ C-Acetazolamide treatment D-Starvation E-NH<sub>4</sub>Cl ingestion

**45. The normal specific gravity of the first morning urine sample is:**

- A-1.001-1.005 B-1.005-1.010 C-1.010-1.015 ☒ D-1.015-1.025 E-1.035-1.040

**46. Nephrotic syndrome is characterized by which of the following?**

- A-Increased serum albumin B-Mild proteinuria C-Hyponatremia  
☒ D-Hypercholesterolemia E-None of the above.

**47. SIADH is characterized by which of the following findings?**

- A-Hypovolemia B-Decreased plasma ANP C-Hyponatremia  
D-Polyuria ☒ E-Increased urine osmolality

**48. Risk factors for urinary tract stone formation include all of the following, EXCEPT:**

- A-Hypercalciuria B-Hyperoxaluria ☒ C-Hypercitraturia D-Cystinuria E-Hyperuricosuria

**49. SIADH syndrome is characterized by all the following, EXCEPT:**

- ☒ A-Increased sodium concentration in urine B-Normal renal function  
☒ C-Decreased urine osmolality D-Decreased plasma osmolality  
E-Normal adrenal function

63. Plasma ADH level is high **B** D-Neither of them

64. Increased plasma calcitonin A-MEN type IIa

65. Hyperprolactinemia B-MEN, type IIb

66. Hypercalcemia C-Both of them

67. Multiple mucocutaneous neuromas D-Neither of them

68. Diabetic nephropathy A-Glomerular proteinuria

69. Myoglobinuria B-Tubular proteinuria

70. Bence-Jones proteinuria C-Overflow proteinuria

71. Fanconi's syndrome D-None of the above

72. Hemoglobinuria

73. Increased in Gilbert's syndrome A-Unconjugated bilirubin in serum

74. Greatly increased in obstructive jaundice B-Conjugated bilirubin in serum

75. Increased in acute hepatitis C-Both of them

76. Greatly increased in malaria D-Neither of them

77. Increased in rickets A-Serum Alkaline Phosphatase

78. Increased in alcoholism B-Serum Gamma Glutamyl Transferase

79. Increased in obstructive jaundice C-Both of them

80. Increased in pregnancy D-Neither of them

Good Luck

Assistant Professor : Nizar kishkeh



- Answer the following questions (only ONE CORRECT answer for each question) :

1. Renin- angiotensin –aldosterone system is activated in which of following conditions ?

- A- Severe diarrhea      B- Liver cirrhosis with ascites      C- Congestive heart failure  
D- Primary adrenal failure      E- All of the above

2. Which of the following renal stones is associated with an alkaline urine ?

- A- Calcium oxalate stones  
B- Uric acid stones  
C- Cystine stones  
D- Triple phosphate stones  
E- All of the above

3. The tests used to assess the renal tubular functions include :

- A- Measurement of urine specific gravity      B- Water deprivation test  
C- Urine acidification test      D- Urine dilution test  
E- All of the above

4. Regarding urea , which of the following statements is true?

- A- Serum urea concentration is not affected by dietary proteins  
B- It is synthesized primarily in the kidneys  
C- Serum urea concentration is decreased in renal failure  
D- It is not reabsorbed by renal tubules  
E- Its renal clearance is less reliable index of GFR than creatinine renal clearance

5. Regarding Renin , which of the following statements is true?

- A- It is synthesized by distal tubule epithelial cells  
B- It converts angiotensin I to angiotensin II  
C- It inhibits aldosterone secretion from adrenal cortex  
D- Its plasma concentration is increased in patients with nephrotic syndrome  
E- Its secretion is stimulated when serum sodium level is increased

6. Regarding creatinine , which of the following statements is true ?

- A- It is not secreted by renal tubules      B- It is formed from hydration of creatine  
C- It is a protein nitrogenous compound      D- It is not reabsorbed by renal tubules  
E- It is synthesized in the liver

**7. In adults, jaundice begins to become clinically apparent when serum bilirubine level exceeds :**

- A-6.5 mg/dl    B-4.5 mg/dl    C-5.5 mg/dl    D-2.5 mg/dl    E-7.5 mg/dl

**8. Unconjugated hyperbilirubinemia can be found in :**

- A-Gilbert's syndrome    B-Pancreatic cancer    C-Common bile duct stone  
D-Sclerosing cholangitis    E-All of the above

**9. ECG changes due to hyperkalemia include which of the following ?**

- A-Widened QRS complex    B-Tall P wave    C-Flattening of T wave  
D-ST segment elevation    E-All of the above

**10. Hypocalcaemia can be found in :**

- A-Acute pancreatitis  
B-Sarcoidosis  
C-Thiazide diuretics use  
D-Hyperparathyroidism  
E-All of the above

**11. Hypophosphataemia can be found in :**

- A-Hypoparathyroidism    B-Osteomalacia  
C-Tumor lysis syndrome    D-Renal failure  
E-Pseudohypoparathyroidism

**12. Ketone bodies are produced in :**

- A-Liver    B-Brain    C-Erythrocytes  
D-Skeletal muscles    E-All of the above

**13. Creatinine clearance is increased in which of the following conditions ?**

- A-Dehydration    B-Shock    C-Renal failure    D-Normal pregnancy    E-Advanced age

**14. In heme catabolism, biliverdin is converted to bilirubine in reticuloendothelial cells by the process of :**

- A-Reduction    B-Oxidation    C-Conjugation    D-Hydration    E-Dehydration

**15. Regarding ADH, which of the following statements is true?**

- A-It increases water reabsorption from proximal renal tubules  
B-It is stored in posterior pituitary gland  
C-Is secreted when plasma osmolality is decreased  
D-It decreases the osmolality of urine.  
E-All of the above

**16. Aldosterone increases which of the following ?**

- A-Excretion of Phosphate    B-Excretion of water    C-Reabsorption of  $K^+$   
D-Excretion of  $Na^+$     E-Excretion of  $H^+$

**17. Alkaline urine can be found in which of the following conditions ?**

- A-DKA    B-Gout    C-RTA, type I    D-Cystinuria    E- $NH_4Cl$  ingestion



**24. Sterile pyuria can be found in :**

- A-Partially treated cystitis
- B-Renal tuberculosis
- C-Renal transplant rejection
- D-Papillary necrosis
- E-All of the above

**25. A patient has the following biochemical findings in the plasma :**

Total calcium : Increased, phosphate : Decreased, ALP level is Increased, PTH level is increased. The most likely diagnosis in this patient is :

- A-Milk-alkali syndrome
- B-Hyperparathyroidism
- C-Paget's disease of bones
- D-Bone metastases
- E-Osteomalacia

**26. Which of the following blood serum tests reflects the synthetic function of hepatocytes ?**

- A-ALT
- B-GGT
- C-ALP
- D-Albumin
- E- $\gamma$ -globulins

**27. A person has the following serological markers of HBV results :**

HBsAg : Positive

Anti-HBc antibodies (IgM): Negative

Anti-HBc antibodies (IgG): Positive

Anti-HBs antibodies: Negative.

**These lab findings are most consistent with:**

- A-Immunity against HBV due to past vaccination.
- B-Immunity against HBV due to past natural infection.
- C-Chronic HBV hepatitis.
- D-Acute HBV hepatitis.
- E-None of the above.

**28. Which of the following lab findings is found in hemolytic jaundice ?**

- A-Serum direct bilirubin is greatly increased.
- B-Serum alkaline phosphatase is normal.
- C-Bilirubin is positive in urine.
- D-Serum ALT is greatly increased.
- E-Urobilinogen is decreased in urine.

**29. Wilson disease is characterized by which of the following ?**

- A-Increased copper reabsorption from the kidney.
- B-Raised serum levels of ceruloplasmin
- C-Raised urinary levels of free copper
- D-Raised serum levels of total copper
- E-All of the above

**30. A very high serum ALT with slightly increased ALP is most consistent with :**

- A-Chronic viral hepatitis
- B-Physiological jaundice
- C-Common bile duct stone
- D-Acute viral hepatitis
- E-Gilbert's syndrome

**18. A person has the following serological markers of HBV results : 18**

HBsAg : Positive

Anti-HBc antibodies (IgM): Positive

Anti-HBc antibodies (IgG): Negative

Anti-HBs antibodies: Negative .

**These lab findings are most consistent with:**

A-Immunity against HBV due to past vaccination

B-Acute HBV hepatitis

C-Chronic HBV hepatitis

D-Immunity against HBV due to past natural infection

E-None of the above

**19. Hypophosphataemia is found in :**

A Pseudohypoparathyroidism..

B-Hypoparathyroidism.

C-Tumor lysis syndrome.

D-Osteomalacia

E-All of the above

**20. A person has the following serological markers of HBV results :**

HBsAg : Negative

Anti-HBc antibodies (IgM): Negative

Anti-HBc antibodies (IgG): Positive

Anti-HBs antibodies: Positive .

**These lab findings are most consistent with:**

A-Immunity against HBV due to past vaccination

B-Immunity against HBV due to past natural infection

C-Chronic HBV hepatitis

D-Acute HBV hepatitis

E-None of the above.

**21. Hereditary hemochromatosis is characterized by which of the following laboratory findings ?**

A-Serum iron is increased ,TIBC is increased    B-Serum iron is decreased ,TIBC is increased

C-Serum iron is normal ,TIBC is increased    D-Serum iron is decreased ,TIBC is decreased

E-Serum iron is increased ,TIBC is decreased

**22. Regarding calcium, which of the following statements is true ?**

A-Both ionic and non-ionic fractions are physiologically active

B-Plasma level is regulated only by PTH

C-Intestinal absorption is reduced in chronic renal failure

D-Plasma level is increased by calcitonin

E-None of the above

**23. Regarding PTH, which of the following statements is true?**

A-It decreases reabsorption of phosphate from proximal renal tubules

B-Its plasma level is low in patients with chronic renal failure.

C-It inhibits renal 1- $\alpha$  hydroxylase.

D-It decreases reabsorption of calcium from renal tubules.

E-None of the above.