QUESTION ONE:

Give the scientific term for each of the following description:

(10X2= 20 marks, 20 min)

No	Description	Scientific term
1.	Coma occurs mostly in elderly non-insulin dependent diabetics	
2.	Peptides that are structurally similar to proinsulin and are secreted by the liver in response to GH	
3.	The preferred biochemical test indicated for pregnant women with a family history of DM	
4.	A glycoprotein produced in large amounts during fetal life and it is elevated in normal pregnancy and liver disease	
5.	It is catecholamine- producing tumor, it's symptoms include palpitation and diaphoresis	
6.	They are mutated derivatives of normal genes whose function is to promote proliferation or cell survival and involved in the development of cancer	
7.	It is a good index of diabetic control and it reflects glycemic control over the previous 90 days	
8.	A disease is characterized by hepatomegaly, fasting hypoglycemia and is caused by deficiency of glucose-6-phosphatase	
9.	A peptide hormone acts on kidneys to increase excretion of the fluid and it is a specific marker of edema due to heart failure	
10.	A hormone acts on follicular cells of the thyroid to increase production and iodination of thyroglobulin	

QUESTION TWO:

Mention the tumor marker(s) of the following cancer diseases:

(10x2= 20 marks, 15 min)

No	Cancer type	Tumor marker(s)
1.	Pancreatic cancer	
2.	Hepatocellular carcinoma	
3.	Follicular cancer	
4.	Neuroblastoma	
5.	Colorectal cancer	
6.	Breast cancer	
7.	Ovarian cancer	
8.	Insulinoma and islet cell tumors	
9.	Prostate cancer	
10.	Bladder cancer	

QUESTION THREE:

Read the following clinical cases and answer the related questions:

(2x15=30 marks, 25 min)

Case I:

The patient is a 41year-old male who has a history of diabetes and presents to the hospital with a complaint of lethargy and lower extremity edema.

Laboratory Data

Serum parameter	Patient results	Normal values
Sodium	134	136-146 mmol/L
Potassium	6.8	3.5-5.3 mmol/L
Total HCO_3^-	14	23-27 mmol/L
BUN	75	7-22 mg/dL
Creatinine	5.5	0.7-1.5 mg/dL
Glucose	154	70-110 mg/dL
Calcium	7.1	8.9-10.3 mg/dL
Phosphorus	10.3	2.6-6.4 mg/dL
Parathyroid Hormone	402	10-65 pg/mL
Hemoglobin	8.9	14-17 gm/dL
Mean cell volume	91	85-95 FL

1- What is the suggested renal disease? Give reasons for your answer?

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2- Why is the parathyroid hormone elevated?

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3- What is the type of patient's anemia and what is the most likely cause of this anemia?

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4- Define by equation the creatinine clearance.

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Case II:

A 72-year-old man presented to his general practitioner with back pain and weakness. The following are the results of some of his laboratory tests:

Some of his laboratory results were as flows:

Plasma measurement	Patient results	Normal reference range
Sodium	136 mmol/L	(135–145)
Potassium	4.9 mmol/L	(3.5–5.0)
Urea	13.7 mmol/L	(2.5–7.0)
Creatinine	160 µmol/L	(70–110)
Albumin-adjusted calcium	3.20 mmol/L	(2.15–2.55)
Total protein	98 g/L	(60–75)
Albumin	35 g/L	(35–45)
Globulins	64 g/L	(15–30)
Haemoglobin concentration of	9.3 g/dL	(14-18)

Urinary protein electrophoresis showed Bence Jones protein. Skeletal bone survey showed lytic bone lesions.

1. What's probable diagnosis?

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2. Explain lab results of increased plasma total proteins.

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3. Draw the serum protein electrophoretic pattern for the patient?

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4. Why hemoglobin concentration is below normal? And what type of anaemia?

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QUESTION FOUR:

B. Select and mark the ONE correct answer in the bubble sheet:

(40x2 = 80 marks, 60 min)

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1. Growth hormone causes hyperglycemia. It is a result of:

A. Decreased peripheral utilization of glucose

B. Decreased hepatic production via gluconeogenesis

C. Increased glycolysis in muscle

D. Decreased lipolysis

2. A hormone secreted from posterior pituitary is:

A. Vasopressin

B. Thyrotropic hormone

C. Prolactin

D. Adrenocorticotropic hormone

3. Acromegaly results due to excessive release of:

A. Thyroxine B. Growth hormone

C. Insulin D. Glucagon

4. The hormone required for uterine muscle contraction for child birth is:

A. Progesterone B. Estrogen

C. Oxytocin D. Vasopressin

5. Increased reabsorption of water from the kidney is the major consequence of the secretion of the hormone?

A. Cortisol B. Insulin

C. Vasopressin D. Aldosterone

6. PTH:

A. Reduces the renal clearance or excretion of calcium

B. Increases renal phosphate clearance

C. Increases the renal clearance of calcium

D. Decreases the renal phosphate clearance

7. Insulin stimulates:

A. Hepatic glycogenolysis

B. Hepatic glycogenesis

C. Lipolysis

D. Gluconeogenesis

8. Action of insulin on lipid metabolism is:

A. It increases lipolysis and increases triglyceride synthesis

B. It decreases lipolysis and increases triglyceride synthesis

C. It decreases lipolysis and decreases triglyceride synthesis

D. It increases synthesis of triglyceride and increased ketogenesis

9. Glucagon enhances:

A. Hepatic glycogenolysis

B. Muscle glycogenolysis

C. Hepatic glycogenesis

D. Lipogenesis

10. The hormone that protects young women against myocardial infarction is:

A. Estrogen B. Progesterone

C. Growth hormone D. Oxytocin

11. Hormone receptors possess all the following properties <u>EXCEPT</u>:

A. All of them are proteins

B. They possess a recognition domain

C. They bind hormones with a high degree of specificity

D. Number of receptors in a target cell is constant

12. Somatotropin is secreted by:

A. Hypothalamus B. Anterior pituitary

C. Posterior pituitary D. Thyroid gland

13. Secretion of growth hormone is inhibited by:

A. Somatomedin C
B. Somatostatin
C. Feedback inhibition
D. All of these

14. The most powerful thyroid hormone is:

A. Reverse T3
B. DIT
C. T3
D. T4

15. Diabetes mellitus can occur due to all of the following <u>EXCEPT</u>:

A. Deficient insulin secretion
B. Tumor of β-cells
C. Decrease in number of insulin receptors
D. Formation of insulin antibodies

16. Glucagon secretion increases:

A. After a carbohydrate-rich meal
B. After a fat-rich meal
C. When blood glucose is high
D. When blood glucose is low

17. Thyroxin is synthesized from the amino acid:

A. Tyrosine
B. Alanine
C. Histidine
D. Glycine

18. Which of the following hormones are synthesized as prohormones:

A. Vasopressin and oxytocin
B. Growth hormone and insulin
C. Insulin and parathyroid hormone
D. Insulin and Glucagon

19. Which of the following is enzyme used as tumor marker?

A. PSA
B. PLP
C. HCG
D. CEA

20. In rheumatoid arthritis, serum protein electrophoresis is characterized by:

A. Beta-gamma bridge
B. Broad β-band
C. Diffuse γ globulin band
D. Intense albumin band

21. Which of the following is found in patients with encephalopathy?

A. Electrophoretic broad γ band
B. Hyperammonemia
C. Hyperoxaluria
D. Hypocitraturia

22. Which of the following is found in patients with diabetic nephropathy?

A. Elevated AST
B. Homocysteinuria
C. Hyperammonemia
D. Microalbuminuria

23. Regarding hepatic jaundice, which of the following statements is CORRECT?

A. CK-MB is elevated
B. Conjugated bilirubin and unconjugated bilirubin are elevated
C. It may result from hemolysis of RBCs
D. It may result in formation of pigment gall stones

24. Renal tubular acidosis is characterized by:

A. Acidic pH of the urine
B. Retention of bicarbonate ions
C. Metabolic acidosis
D. Loss of hydrogen ions

25. Edema is associated with all of the following EXCEPT:

A. Abetalipoproteinemia
B. Liver failure
C. Nephrotic syndrome
D. Severe sepsis

26. Regarding neonatal jaundice, which of the following statements is INCORRECT?

A. It differs from physiological jaundice
B. It may cause kernicterus
C. Phototherapy is recommended when bilirubin levels are elevated
D. Sulfonamides and salicylates are recommended

27. Regarding LDL receptor, which of the following statements is CORRECT?

A. It binds to lipoproteins containing apo C-II
B. It is present on the surface of the cell in "coated pits"
C. It is present only in the adipose tissue
D. It is regulated by intracellular phospholipid concentration

28. Post-renal uremia may be developed from:

A. Decreased plasma volume and renal blood flow
B. Diminished cardiac output
C. Hemorrhage
D. Renal stones

29. Regarding Lp(a), which of the following statements is <u>CORRECT</u>?

A. Elevated Lp(a) stimulates the breakdown of blood clots
B. It antagonizes fibrinogen
C. It competes with plasminogen for the binding of plasminogen activators
D. It is nearly identical in structure to an HDL particle

30. A defective bicarbonate reabsorption in the proximal tubules is known as:

A. Diabetes insipidus
B. Type I renal tubular acidosis
C. Type II renal tubular acidosis
D. Type IV renal tubular acidosis

31. Heavy β band in plasma lipoprotein electrophoresis indicates:

A. Type II-a hyperlipoproteinemia
B. Type III hyperlipoproteinemia
C. Type IV hyperlipoproteinemia
D. Type V hyperlipoproteinemia

32. Fasting plasma sample was kept at 4°C for 16 h. It appeared with surface creamy layer and clear infranate, which would indicate:

A. Type I hyperlipoproteinemia
B. Type II-a hyperlipoproteinemia
C. Type IV hyperlipoproteinemia
D. Type V hyperlipoproteinemia

33. Intracellular cholesterol acts to:

A. Inhibit cholesterol esterification by inhibiting the enzyme ACAT
B. Inhibit HDL synthesis
C. Inhibit HMG-CoA reductase, the rate limiting step in cholesterol synthesis
D. Stimulate HTGL activity

34. All of the following diseases precipitate secondary hyperlipidemia <u>EXCEPT</u>:

A. Cholestasis
B. Diabetes mellitus
C. Addison's disease
D. Nephrotic syndrome

35. Hepatic steatosis occurs frequently as a consequence of excessive alcohol ingestion, obesity and diabetes.

A. True B. False

36. The capacity of proximal renal tubules to reabsorb bicarbonate is reduced in type I renal tubular acidosis.

A. True B. False

37. Transferrin is alpha$_2$ globulin that transports copper and is reduced in Wilson's disease.

A. True B. False

38. Regarding acute phase protein release, complement proteins will prevent the spread of tissue necrosis when lysosomal enzymes are released by damaged cells at the site of injury.

A. True B. False

39. Hypertriacylglycerolemia is one of metabolic changes occuring only in type 2 DM.

A. True B. False

40. GHRH is peptide that structurally similar to proinsulin and exhibit some affinity for insulin receptors.

A. True B. False

BEST WISHES