EXAM COVER SHEET

Course Code: **CLS 432**

Course Description: **Clinical Biochemistry**

Final Exam

Duration: 2 hour

1st semester 1432/1433

Student Name: _____

Student Uni No: _____

Part 1 – Multiple choice questions

Answer all the questions by encircling the best answer. *(20 marks).*

1. Which of the following anticoagulants is most suitable for the collection and preservation of specimens for measurement of plasma glucose?
    A. Lithium heparin
    B. Potassium and ammonium oxalate mixture
    C. Potassium citrate
    D. Sodium fluoride and potassium oxalate mixture
    E. None of the above
2. Which of the following measurements of plasma enzyme activity is most likely to be abnormal in the prodromal stages of infectious hepatitis?
    A. Urea stable lactate dehydrogenase
    B. Alanine aminotransferase
    C. Alkaline phosphatase
    D. Gamma glutamyl transferase
    E. All of the above
3. Which of the following substances is most likely to be present in plasma in increased concentration in patients with cirrhosis of the liver?
    A. Albumin
    B. Transferrin
    C. Urea
    D. Immunoglobulins
    E. All of the above
4. A diagnosis of hepatolenticular degeneration (Wilson's disease) is strongly supported by finding:
    A. A generalized amino aciduria and increased plasma copper.
    B. A decreased plasma ceruloplasmin and increased excretion of copper in the urine.
    C. An increased plasma ceruloplasmin and decreased excretion of copper in the urine.
    D. A decrased plasma copper and increased plasma ceruloplasmin.
    E. None of the above
5. Insulin induced hypoglycaemia produces an increase in the plasma concentration of:
    A. Thyrotrophin-releasing hormone
    B. Parathyroid hormone
    C. Pituitary gonadotrophins
    D. Growth hormone
    E. All of the above

6. On testing with Ehrlich's aldehyde reagent , a urine sample that gives a pink colour which can be extracted into organic solvents, suggests the presence of increased urinary:
   A. Acetoacetate
   B. Conjugated bilirubin
   C. Urobilinogen
   D. Porphobilinogen
   E. None of the above

7. In the performance of an oral glucose tolerance test :
   A. The patient's carbohydrate intake should be restricted to 50 g/day for 3 days prior to the test, and the patient should fast beforehand overnight
   B. The patient should not have been unusually energetic before the test
   C. Nervous patients may smoke during the test to relieve their anxiety
   D. During the test, if lying down the patient should lie on the left side.
   E. None of the above

8. Which one of the following considered the gold standard agent used to determine GFR?
   A. Urea
   B. Creatinine
   C. Inulin
   D. ^{99m}TcDTPA
   E. None of the above

9. Cystatin-C
   A. It is freely filtered at glomerulus
   B. It has a Constant production rate
   C. Not influenced by muscle mass, diet or subjects sex
   D. Measured by immunoassay
   E. All of the above
10. Electrophoresis of serum proteins:
   A. Often reveals the presence of previously unsuspected liver disease
   B. Separates proteins into three main groups
   C. Is unlikely to detect light chain disease
   D. Cannot be used satisfactorily to screen for α_1-anti-trypsin abnormalities
   E. None of the above

11. Horseradish peroxidise is the most popular label in --------
    A. Radioimmunoassay
    B. Enzyme Immunoassay
    C. Chemiluminescent Immunoassays
    D. Immunofluorescence
    E. None of the above

12. Which one of the following molecules capable of chemiluminescence
    A. sodium hydroxide
    B. Acridium esters
    C. Alkaline phosphatase
    D. Glucose-6-phosphate dehydrogenase
    E. All of the above

13. Three days after a moderately severe but otherwise uncomplicated myocardial infarction, the following plasma enzyme would probably considerably increased:
    A. Alanine aminotransferase
    B. MB isoenzyme of creatine kinase
    C. Troponnin I
    D. Total creatine kinase
    E. Myoglublin

14. Absent of C-peptide is a clinical feature of
    A. Type 1 diabetes
    B. Type 2 diabetes
    C. Both types of diabetes
    D. Gestational diabetes mellitus
    E. None of the above

15. Increased plasma unconjugated bilbrubin occurs in:
    A. Pernicious anaemia
    B. Gilbert's syndrome
    C. Hepatocellular jaundice
    D. Crigler-Najjar syndrome
    E. All of the above

16. Uncojugated bilirubin:
    A. requires accelerator for diazo reaction
    B. is rendered more water-soluble by binding to albumin
    C. is conjugated with glucuronic acid in the hepatocytes
    D. is reformed in the intestine by bacterial action on conjugated bilirubin
    E. all of the above

17. Most commonly used method to measure hormones in the clinical specimens inside the laboratory
    A. Electrophoresis
    B. Spectrophotometry
    C. RIA
    D. Photometer
    E. None of the above

18. It is estimated that 90% of the laboratory errors are due to :
    A. Pre- and post-analytical errors
    B. Post analytical errors
    C. Analytical and post analytical errors
    D. Analytical errors
    E. None of the above

19. Difference between plasma and serum is that plasma---------
    A. Does not contain fibrinogen
    B. Has more water
    C. Contains fibrinogen (Plasma)
    D. Contains fibrinogen (serum)
    E. None of the above

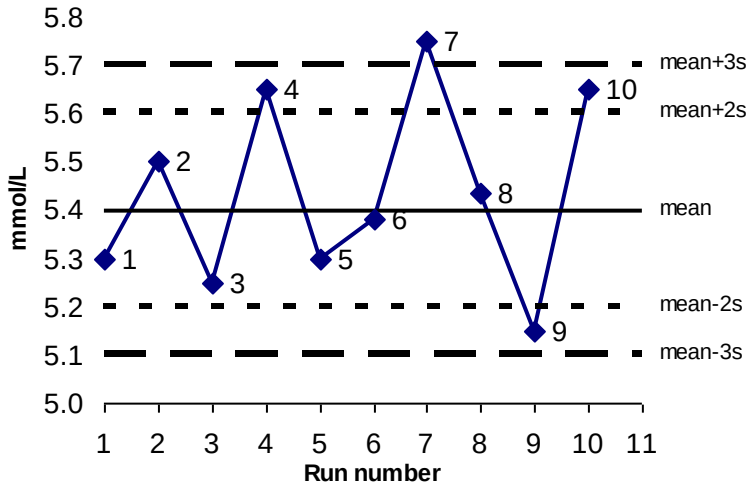
20. Responsibility of clinical chemistry is
    A. Quality control
    B. Management
    C. Accreditation
    D. Lab auditing
    E. None of the above

Part 2 - short answer questions. Answer all questions (*20 marks)*

Answer **only 4** questions from this section

1. What is the Enzyme Linked ImmunoSorbent Analysis (ELISA) technique? Explain the difference between competitive and non-competitive immunoassays.

2. List the Westgard quality control rules. What action should you take when obtaining result number 10 on the following QC chart? Which other results would have generated warning or rejection flags?



3. List the laboratory tests useful in an adult with jaundice and explain why they are helpful.

4. A patient with a history of gall stones presents with abdominal pain.

   Bilirubin 139 umol/l (RR 3-20)

   Albumin 41 g/L (RR 35-50)

   A. Would you expect the alkaline phosphatase to be highly elevated, moderately raised or normal?
   B. Would you expect the alanine aminotransferase to be highly elevated, moderately raised or normal?
   C. Would you expect the urine bilirubin to be elevated?
   D. Where does bilirubin come from?
   E. How is bilirubin measured?

5. A patient presented with back pain and loss of weight. On examination he was anaemic.

Plasma	Albumin	32	g/L	(36 - 47)
	Calcium	2.72	mmol/L	(2.12 – 2.62)
	ALP	90	U/L	(40 - 110)
	Creat	180	mmol/L	(55 – 120)
	TP	84	g/L	(63 - 83)
	IGG	37	g/L	(5.0 – 13.0)
	IGA	<0.4	g/L	(0.5 – 4.0)
	IGM	<0.2	g/L	(0.3 – 2.5)

   A. What is the diagnosis?

   B. How are the IgA and IgM levels explained?

   C. What is the likelihood of Bence Jones Protein being present in the serum?

   D. Why is the calcium raised?

   E. Name 4 factors that influence the migration of proteins during electrophoresis?