Question Paper Code: U1031

SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION & RESEARCH

(A DEEMED TO BE UNIVERSITY)

M.B.B.S Phase-I Degree Examination February 2021

Time:3 hours **Max Marks:100**

BIOCHEMISTRY- PAPER 1

Your answer should be specific to the question asked

Draw neat and labeled diagrams wherever necessary

LONG ESSAY ***2 X 10 = 20 Marks***

1. Define Enzymes. Classify enzymes. Give two examples for each class and the reaction catalyzed by them. (1+5+4)
2. Describe the chemistry, sources, RDA, biochemical functions and deficiency manifestations of Thiamine. (1+1+1+3+4)

SHORT ESSAY ***10 X 5 = 50 Marks***

3. Explain the formation of peptide bond. Give its salient features.
4. What is Protein Energy Malnutrition? Classify & explain the causes, clinical features and biochemical findings. (1+4)
5. Name the hormones of pancreas. Write their actions. (1+4)
6. Define & Classify Lipids with suitable examples. (1+4)
7. Classify carbohydrates with suitable examples. Name any two hexoses with their biomedical importance. (3+2)
8. Name the thyroid hormones with their biological reference range. Add a note on clinical conditions due to their decreased and increased synthesis (1.5+1.5+2)
9. Write the biological reference range of serum Albumin. Describe its biological functions. (1+4)
10. What are Glycosaminoglycans? List any four Glycosaminoglycans with their biomedical significance. (1+4)
11. What are micelles, liposomes and lipid bilayer? Mention the biomedical importance of each of them.
12. Define BMR. Describe the factors affecting BMR. (1+4)

SHORT ANSWERS ***10 X 3 = 30 Marks***

13. What is alpha helix of protein structure? Mention its salient features.
14. Mention the biomedical importance of: a) Cyclic GMP b) PAPS c) Cyclic AMP
15. List any three synthetic nucleotide analogs and mention their uses
16. What is active transport? Give two examples.
17. Explain the protein sparing action of carbohydrates in the body.
18. Define radioactive decay. What are the different types of radioactive decay?
19. What is External Quality Control? Mention its applications.
20. What are reactive oxygen species? Name four disease states associated with excess production of reactive oxygen species. (1+2)
21. Mention the functions of peroxisomes and name any two clinical conditions where defects in peroxisomes are implicated.
22. What are glycoproteins? Give two examples with biological functions.

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BIOCHEMISTRY- PAPER 2

Your answer should be specific to the question asked
Draw neat and labeled diagrams wherever necessary

LONG ESSAY ***2 X 10 = 20 Marks***

1. Define Glycolysis. Write the reactions by which glucose is converted to lactate. Add a note on energetics, regulation and inhibitors of glycolysis. (1+5+2+1+1)
2. Define lipoproteins. Classify lipoproteins. Explain the mechanism of reverse cholesterol transport by HDL. (1+3+6)

SHORT ESSAY ***10 X 5 = 50 Marks***

3. Explain the salvage pathway of purine synthesis. Write its biological significance. (3+2)
4. What is the Biological reference range of serum calcium? Describe the biochemical functions of calcium. (1+4)
5. What is recombinant DNA technology? Explain the steps of rDNA technology. (1+4)
6. Define and describeTransamination with examples. Give two examples of aminoacids which does not undergo transamination. (1+3+1)
7. Define mutation. Explain in detail the different types of mutation. (1+4)
8. Define Jaundice. Classify jaundice & mention the causes for each type of jaundice. (1+2+2)
9. What is the normal blood pH? Explain the renal mechanism by which acid-base balance is regulated in the body. (1+4)
10. What are Phase II reactions of detoxification? Explain with suitable examples.
11. Write the role of liver in integration metabolism.
12. What are protooncogenes? Describe the various mechanisms by which they are activated to cancer producing oncogenes. (1+4)

SHORT ANSWERS ***10 X 3 = 30 Marks***

13. Write the Biological reference range of serum uric acid. Mention two conditions with raised uric acid levels. (1+2)
14. Mention any three inhibitors of oxidative phosphorylation and indicate their site of action.
15. What are lipotropic factors? Give 4 examples. (1+2)
16. Mention the enzyme defect in phenylketonuria. Write any two biochemical tests to diagnose. (1+2)
17. Write the significance of uronic acid pathway.
18. Mention the enzyme defect and clinical features of Acute Intermittent porphyria. (1+2)
19. Define anion gap. Mention the normal anion gap. List two conditions associated with increased anion gap. (1+1+1)
20. What is Creatine? Mention the amino acids involved in the synthesis of creatine.
21. What is Sickle cell anemia? Mention the defect. (1+2)
22. Write any three biochemical investigations to diagnose atherosclerosis.

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SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION & RESEARCH
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MBBS Phase-I February 2021

Time : 150 Minutes **Marks : 80**

Biochemistry P I

Your answer should be specific to the question asked
Draw neat and labeled diagrams wherever necessary

Long Essay ***10 × 2 = 20 Marks***

1. Describe the chemistry, sources, Recommended Daily Allowance, biochemical functions and deficiency manifestations of Vitamin A. (1+1+1+3+4)
2. Write the steps of metabolism of Glycine. Enumerate the biologically active compounds derived from Glycine. Add a note on inborn errors associated with Glycine metabolism. (4+4+2)

Short Essay ***5 × 6 = 30 Marks***

3. What are coenzymes and Isoenzymes? Describe the Isoenzyme profile in the Myocardial Infarction.(2+3)
4. Explain the Amphibolic nature of TCA cycle with suitable examples.
5. What are Glycosaminoglycans? List any four Glycosaminoglycans with their biological significance. (1+4)
6. Describe the steps of Galactose metabolism.
7. Define active site of an enzyme. Describe any 4 characteristic features of an active site. (1+4)
8. Explain briefly the following a) Salting out and Salting In b) Isoelectric point (2.5+2.5)

Short Answer ***3 × 10 = 30 Marks***

9. Define & classify Immunoglobulins. Write their functions.
10. Define communication. List four barriers to communication. (1+2)
11. What is conjugation? Give two examples of conjugation reactions. (1+2)
12. Dietary fibers decreases risk of colon cancer - Justify
13. What is Protein Efficiency Ratio? Mention its significance
14. What is effect of short term and prolonged starvation.
15. Write the reference range of serum Albumin and write any 4 biological functions. (1+2)
16. What is active transport? Give two examples
17. What is allosteric regulation? Give two examples.(1+2)
18. Define Antioxidants. Write the role of Glutathione peroxidase in anitoxidant mechanism. (1+2)

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SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION & RESEARCH
(A DEEMED TO BE UNIVERSITY)
MBBS Phase-I Examination February 2021

Time: 150 Minutes **Marks: 80**

Biochemistry P II

Your answer should be specific to the question asked
Draw neat and labeled diagrams wherever necessary

Long Essay ***10 × 2 = 20 Marks***

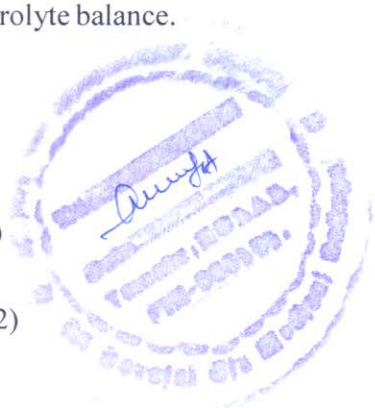
1. Define replication. Describe in detail the DNA replication in prokaryotes. Add a note on inhibitors of replication. (1+7+2)
2. A 50 year old male presents to the emergency ward complaining of chest pain and shortness of breath on climbing stairs. Family history reveals father died from heart attack, and his elder brother had heart attack at the age of 48 years. Physical examination did not show significant abnormality. Laboratory investigations revealed hypercholesterolemia. (1+4+3+2)
   a. Define atherosclerosis.
   b. Describe the pathogenesis of atherosclerosis.
   c. List six diagnostic markers of myocardial infarction.
   d. Add a note on significance of LDL cholesterol and HDL cholesterol in atherosclerosis.

Short Essay ***5 × 6 = 30 Marks***

3. What are the different types of DNAs? Describe the structure of B-DNA with a neat labelled diagram. (1+4)
4. Define Lipids. Classify Lipids with suitable examples. Add a note on spingomyelin. (1+3+1)
5. Define Oxidative Phosphorylation. Describe the mechanism of oxidative phosphorylation. (2+3)
6. A 21-year apparently healthy male patient with sudden onset abdominal pain, nausea and vomiting, hypertension, tachycardia, and peripheral neuropathy after consumption of first alcoholic beverage. Further testing revealed elevated levels of both serum and urine ALA and PBG. He was later diagnosed to be suffering from Acute Intermittent Porphyria. (2+3)
   a. Define and classify porphyrias.
   b. Describe hepatic porphyrias.
7. What is Gout? Mention the clinical manifestations, biochemical alterations and add a note on treatment. (1+1+2+1)
8. What is the normal blood pH? Explain the renal mechanism by which acid-base balance is regulated in the body. (1+4)

Short Answer ***3 × 10 = 30 Marks***

9. What are bile salts and bile pigments? Name the two tests to detect them in urine. (1+1+1)
10. Explain any three factors involved in causation of cancer.
11. Name any three hormones which are involved in the regulation of fluid and electrolyte balance.
12. Mention the sources and two functions of Iodine. (1.5+1.5)
13. What is alkali reserve? Mention its biomedical importance (1+2)
14. Name essential fatty acids and their biomedical importance. (1+2)
15. Name any three copper dependent enzymes.
16. Define anion gap. List two conditions associated with increased anion gap. (1+2)
17. Define Quality Control. What is Precision and Accuracy? (1+1+1)
18. Name the cobalt containing B vitamin and any two reactions catalyzed by it. (1+2)



Question Paper Code: C1031

SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION & RESEARCH
(A DEEMED TO BE UNIVERSITY)
MBBS Phase I Examination –FEB-2021

Time :30Minutes **Marks :20**

Biochemistry Paper I MCQ

1. A sixty years old diabetic patient who had been on insulin for the past 5 years presented for routine follow-up. She was following the dietary regimen strictly and had never missed the insulin injection. Results of the routine laboratory investigations done are given below: Fasting blood glucose : 100 mg/dl (70-110 mg/dl) Post-prandial blood glucose : 140 mg/dl (<140 mg/dl) Urinary reducing sugar : positive

   The urinary dipstick used for identifying the presence of glucose in the sample utilizes:

   a. Aggregated enzymes
   b. Enzyme in solution
   c. Adsorbed enzymes
   d. Immobilized enzymes

2. A 22 years male presents to the hospital with complaints of Abdominal discomfort, diarrhea and muscle cramps. Dietary history of consumption of milk & milk products for last 4-5 days. The physician diagnosed it as lactose intolerance.
   Lactose is a disaccharide made of :

   a. β-D-Galactose + β-D-Fructose
   b. β-D Galactose + β-D-Glucose
   c. β-D-Glucose + β-D-Glucose
   d. β-D-Glucose + β-D-Fructose

3. A 20-year old female was brought to the Emergency Department with nausea, vomiting and abdominal pain. She had been under a lot of stress with final examinations. In her hostel room, her friends noticed an empty bottle of Acetaminophen near the bed. Her acetaminophen blood level was above 200femtogram/mL.
   Acetaminophen is metabolized by following enzyme:

   a. Transaminases
   b. Cytochrome P450 enzyme system
   c. UDP Glucaronyltransferase
   d. GSH Peroxidase

4. A 3-month old infant was brought to the hospital with excessive irritability, abnormal posturing since birth and delayed milestones. There is a history of sibling death at Day 15 of life. The clinician reported abnormal urine odour. On investigation, the concentrations of branched chain amino acids in plasma and urine were found to be very high. The most probable diagnosis is

   a. Alkaptonuria
   b. Phenylketonuria
   c. Maple Syrup urine disease
   d. Hartnup's disease

5. A 12 year old girl was brought in with complaints that she was lethargic, weak and pale. Symptoms would disappear on eating. Physical examination showed that the abdomen was distended due to enlarged liver. Fasting Blood glucose when measured was 45 mg/dl. Triacylglycerol and Uric acid levels were elevated. Liver biopsy showed massive deposition of glycogen in liver cytosol. The case was diagnosed as Glycogen storage disorder Type 1 due to deficiency of

   a. Glucose 6 phosphatase
   b. Glycogen synthase
   c. Glucose 1 phosphatase
   d. Glycogen phosphorylase

6. A 3 year old child was brought to the hospital with complaints of vomiting, abdominal pain and severe sweating. It was found that he missed his usual diet and had eaten only sweets and fruits. He was hypoglycemic but urine was positive with Benedicts test. Specific testing showed presence of fructose in urine. He was diagnosed with Hereditary fructose intolerance which is due to deficiency of

    a. Aldolase B
    b. Fructokinase
    c. Phosphofructokinase
    d. Xylitol dehydrogenase

7. A two year old boy was brought to hospital. The child had been breast fed for 2 years and was now being fed with diluted cow's milk, rice and dal. He had edema, intermittent diarrhea and showed poor growth. On examination he was found to be underweight for his height. He was pale weak and his hair was discoloured. Abdomen was distended and liver moderately enlarged. Laboratory investigations revealed Hb -6 gm%, Total protein – 4.4 gm% and Albumin 2gm%. The child was suffering from PEM of which the most probable diagnosis was

    a. Marasmus
    b. Kwashiorkor
    c. Rickets
    d. Beri–beri

8. A 45 year old man presented with severe back pain and weakness, loss of appetite, rapid loss of weight in the last 3 months. The X-ray of skull revealed punched out lesions. His bone marrow biopsy showed excess of plasma cells. Based on the serum protein electrophoresis it was diagnosed as a case of Multiple myeloma. The following is the characteristic finding in serum protein electrophoresis.

    a. M Spike in the γ globulin band
    b. β-γ Bridging
    c. Increased Alpha 2 globulin
    d. Increased β band

9. A 7 year old child was brought to the hospital with complaints of slow growth pain in bones.On examination he was anemic, had frontal bossing, bowing of legs and swelling of costochondral junction. Lab results were: Serum calcium:8.2mg/dL, serum phosphorous: 2.8mg/dL and serum alkaline phosphatase: 720U/L. The most probable diagnosis is

    a. Osteogenesis
    b. Rickets
    c. Osteomalacia
    d. Osteoporosis

10. A 32-year-old man with generalised weakness had a biopsy taken from his quadriceps muscle, which was examined using electron microscopy. The pathologist reported an abnormal appearance of the Golgi apparatus. The main role of the Golgi apparatus is

    a. Controls amino acid breakdown
    b. Controls lipid breakdown.
    c. Controls protein processing.
    d. Initiates protein assembly

11. A 30 years male presents to the hospital with complaints of polyuria, polyphagia, polydypsia. Random Blood Sugar was 290mg/dL& urine examination showed presence of microalbuminuria. The physician advised the patient to undergo the test to assess glomerular function. The polysaccharide used in assessing the glomerular filtration rate is

    a. Glycogen
    b. Starch
    c. Hyaluronic acid
    d. Inulin

12. A thiry six year old man consulted an optician to obtain a prescription for reading glasses. The optician noticed that the patient had bilateral arcussenilis, and recommended that he consult to general medical practitioner. The general practitioner found that he also had tendon xanthoma, arising from the Achilles tendons. Blood pressure was normal; his father had died of a heart attack at the age of forty years. An ECG taken at rest was normal but ischemic changes developed on exercise. Analysis of fasting blood for lipids showed the following Serum Cholesterol :725 mg/dl Serum Triglyceride : 149 mg/dl LDL-cholesterol :538 mg/dl HDL-cholesterol :40 mg/dl The patient was advised medical nutritional therapy and treated with lovastatin which inhibit the HMG CoA reductase.
The type of inhibition is:
    a. Competitive Inhibition
    b. Non-competitive Inhibition
    c. Suicide Inhibition
    d. Uncompetitive Inhibition

13. A 40 –year- old, fat female, presents with intolerance to fatty foods, pain in the right side of abdomen, yellowness of eyes and passage of clay colored stools and itching. Laboratory Investigations were done. Ultrasound abdomino pelvic on an empty stomach showed hypoechoic gall bladder. The diagnosis of cholelithiasis was made.
The following enzyme is markedly elevated:
    a. Aspartate transaminase
    b. Alanine transaminase
    c. Alkaline phosphatase
    d. Acid phosphatase

14. 14. A five year old, fair, chubby boy was brought to the hospital with complaints of delayed mile stones,mentalretardation,seizures and eczema. He exhibits light colouredhair,skin and eyes. His blood phenyl alanine levels was>30mg/dL (Biological reference range: 1-2 mg/dL). He was diagnosed with phenylketonuria.
The enzyme deficient in phenylketonuria is
    a. Cystathionase
    b. Phenylalanine hydroxylase
    c. Homogentisic acid oxidase
    d. P-hydroxyphenylpyruvate oxidase

15. A 80 yr old man presented with alteration in mood and behavior. His family reported that he was having progressive disorientation and memory loss over the past six months; he took longer to complete normal daily tasks, had poor judgment and had developed mood and personality changes. The routine blood, urine and CSF analysis did not reveal much. There was no family history of Dementia. The patient was diagnosed to be having Alzheimer's Disease. Alzheimer's Disease is a disease related to
    a. Mucopolysacharides
    b. Insulin deficiency
    c. Protein misfolding
    d. Defective collagen synthesis

16. A 30 year old male was suffering from malaria and was treated with primaquin. During treatment he developed anemia. Laboratory tests revealed reduced hemoglobin levels and increased serum bilirubin. He was diagnosed with hemolytic anemia.

    The deficient enzyme is
    a. Glucose 6 phosphatase
    b. Glucose 6 phosphate dehydrogenase
    c. Pentose 5 phosphate
    d. Aldolase B

17. A 4 year old boy was brought to a children's clinic,his mother was concerned because she had noticed that her son was walking awkwardly fell over frequently and had difficulty in climbing stairs,physical examination revealed muscle weakness in both pelvic and shoulder girdle,modest enlargement of calf muscles,he was diagnosed with Duchenne's Muscular Dystrophy.

    The protein related to this disease is
    a. Albumin
    b. Collagen
    c. Troponin
    d. Dystrophin

18. A 5 year old boy was brought to the pediatrician by his mother with complaints of fever associated with productive cough. On examination it was found to have coarse crepitations and chest X-ray showed lobar pneumonia. Mother provided a history of recurrent infections in the past. The child was diagnosed with deficiency of the complement C3 and properdin which lead to the recurrent bacterial infection.
The pathways which is affected in this condition is
    a. Alternative pathway
    b. Classical pathway
    c. Lectin binding pathway
    d. Terminal pathway

19. A 16 year old boy came for consultation to a Physician. He complained that he was feeling lethargic and practically had no physical activity. On questioning, he admitted that he consumed large amounts of packaged foods and soft drinks. The boy also had truncal obesity. His BP was normal. FBS and Thyroid profile were normal but serum cholesterol and triglycerides were high. A diagnosis of obesity was made and a diet chart give to the patient which advised increased consumption of dietary fibres which would be beneficial as it
    a. Contains essential Amino acids
    b. Contains essential Fatty acids
    c. Provides a feeling of satiety
    d. Contains absorbable Glucose

20. A 18 year old boy visited a physician complaining of fatigue and severe muscle cramps during exercise. His blood levels showed low levels of blood glucose, lactate and pyruvate. He was diagnosed with McArdles syndrome which is due to deficiency of
    a. Liver glycogen phosphorylase
    b. Muscle glycogen phosphorylase
    c. Glycogen synthase
    d. Phosphofructokinase

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MBBS Phase I Examination – FEB-2021

Time : 30 Minutes **Marks : 20**

Biochemistry Paper II MCQ

1. A 28 year male presented with complaints of pain and swelling of the left first metatarsophalangeal joint. On examination swelling was observed in the toe and in other small joints. Personal history states that he is a non-vegetarian and consumes alcohol regularly. Investigation revealed serum uric acid level of 12 mg/dl.
   The most probable diagnosis is
   a. Lesch-Nyhan syndrome
   b. Gout
   c. Rheumatoid arthritis
   d. Osteoarthritis

2. A 54 year old overweight woman presented with complaints of cramps and spasms of both hands. She was depressed and had positive Trosseau's and Chovstek's signs. Past history revealed history of thyroidectomy for Grave's disease. Lab investigations showed serum calcium was 4.1mg/dl (normal – 9-11mg/dl), serum albumin 4g/dl (normal 3.5-5.5g/dl).

   The probable diagnosis is
   a. Hypercalcemia
   b. Hypocalcemia
   c. Hyperkalemia
   d. Hypokalemia

3. A comatosed person admitted to the hospital. Analysis of the arterial blood gave the following values: PCO_2 16 mmHg, HCO_3- 5 mmol/L and pH: 7.1.
   The underlying acid-base disorder is
   a. Respiratory Alkalosis
   b. Metabolic Acidosis
   c. Respiratory Acidosis
   d. Metabolic Alkalosis

4. A 4 year girl presented with failure to thrive and megaloblastic anemia. Obstretic history was uneventful. There was no response to Vitamin B12, folate & pyridoxine therapy and on repeated blood transfusions also there was no improvement of anemia. Urinanalysis revealed presence of crystalline sediments of orotic acid. Very high levels of orotic acid (>1.0 g/day, normal being < 1.4mg/day) was excreted. Following enzyme assays the girl was diagnosed to be suffering from Type 1 Orotic aciduria. The enzyme deficient is:
   a. Orotate phosphoribosyl transferase
   b. Orotidine Monophosphate Decarboxylase
   c. Transaminase
   d. CTP synthetase

5. A 78 year old man was bought to an emergency with difficulty in passing urine and weight loss. The attending urologist suspected carcinoma prostate. The marker which would help in the confirmation of diagnosis is
   a. Carcinoembryonic antigen (CEA)
   b. Alpha- fetoprotein (AFP)
   c. Acid Phosphatase
   d. Alkaline Phosphatase

6. A 64 year male was brought to the emergency department with complains of headache and dizziness. His blood pressure (BP) was 170/110 mmHg and was treated for the hypertensive crisis with intravenous nitroprusside for 48 hours. His BP was restored to normal however, he complained of burning sensation in the throat followed by nausea and vomiting, excessive sweating and dyspnea. There was a sweet almond smell in his breath and arterial blood gas analysis revealed metabolic acidosis.

   The person likely to be suffering from toxicity of the complex IV inhibitor of Electron Transport Chain:
   a. Arsenic
   b. Lead
   c. Cyanide
   d. Thallium

7. A 10 year old girl presented with excessive tiredness, poor appetite, inability to concentrate and tingling sensations. On examination there was pallor. Laboratory investigations revealed decrease in hemoglobin, ferritin and MCV. Total Iron binding capacity (TIBC), Transferrin was increased.
   The probable diagnosis is
   a. Iron deficiency anemia
   b. Sickle cell Anemia
   c. Thalassemia
   d. Megaloblastic anemia

8. A 40 year old diabetic patient was brought to the hospital in a comatose state.On examination he was dehydrated and with characteristic breathing pattern and a sweet smell on his breath. A lab investigation revealed the presence of ketone bodies in urine and was diagnosed as Diabetic ketoacidosis (DKA).

   The sweet smell of breath in DKA is due to
   a. Acetyl coA
   b. Acetone
   c. Acetoacetate
   d. β- hydroxybutyrate

9. A newborn as soon as delivered is wiped with clean cloth from head to toe and wrapped in a separate clean cloth. In neonates, heat generation by shivering is somewhat limited during the first three months and non-shivering thermogenesis consisting of brown adipose tissue metabolism as a primary means of heat production mediated by which of the following:
   a. Thermogenin
   b. 2,4-Dinitrophenol
   c. Dinitro ortho cresol
   d. Valinomycin

10. A 12 year old African boy was admitted to a medical college with complaints of fever and severe body pains. On examination, Hepatosplenomegaly was detected. Lab investigations revealed haemoglobin levels was low (6.0g/dL). Microscopic examination of blood smear revealed sickle shaped RBC. Haemoglobin Electrophoresis shows a distinct HbS band with slower movement than that of adult haemoglobin (HbA1).

    The probable diagnosis is
    a. β- Thalassemia major
    b. Sickle cell Anaemia
    c. α- Thalassemia minor
    d. α- Thalassemia major

11. A 72-year-old man with diabetes presented to the emergency department with chest pain and diagnosed with congestive heart failure. He had no known renal dysfunction. Two weeks later, he presented to the Emergency Department with fatigue, lethargy, and a critically elevated serum potassium level. Shortly thereafter, he suffered a cardiac arrest and died.

    The biological reference range for serum potassium is
    a. 1.5-3.0mEq/L
    b. 0.2-1.2mEq/L
    c. 3.5-5.0mEq/L
    d. 0.2-0.6mEq/L

12. A preterm infant born to a malnourished mother developed difficulty in breathing. He was diagnosed as suffering from Respiratory distress syndrome caused by deficiency of
    a. Sphingomyelin
    b. Plasmalogen
    c. Dipalmitoyl lecithin
    d. Cardiolipin

13. A 5 year child presented with polyneuropathy, retinitis pigmentosa and cerebellar ataxia. Relief of symptoms was noted with complete restriction of milk intake. The child was diagnosed to be suffering from Refsum's disease. The enzyme deficient in the child is:
    a. Phytanic acid oxidase
    b. Medium chain Acyl CoA dehydrogenase
    c. Propionyl CoA carboxylase
    d. Methyl malonyl CoA mutase

14. A neonate institutional delivery presented with yellowish discoloration of skin and conjunctive after 03 days of birth. There is no Rh incompatibility. The neonatologist advised single layer phototherapy and subsequently the baby became normal. The probable diagnosis is:
    a. Physiological Jaundice
    b. Hemolytic disease of the newborn
    c. Obstructive Jaundice
    d. Hepatocellular Jaundice

15. A 15-year old boy had complaints of increased frequency of urination, increased appetite and thirst. On routine examination, his urine was found to contain glucose and ketone bodies. He had a random blood glucose concentration of 190 mg/dl. His oral glucose tolerance test (OGTT) was done. He was diagnosed with type I Diabetes mellitus. Diabetes mellitus is a metabolic disorder related to impaired insulin action or its deficiency. Insulin specifically acts through
    a. Tumor necrosis factor receptor
    b. Colony-stimulating factor receptor
    c. Tyrosine kinase receptors
    d. Ion channel linked receptors

16. A 5 year girl was brought to the dermatologist with complains of roughness of the skin surface and pigmented spots. Such pigmented spots developed gradually all over the body. Ulcerated warty growth was noticed on the face later identified as Basal Cell carcinoma. The defective DNA repair mechanism in this condition is:
    a. Base excision repair
    b. Strand directed mismatch repair
    c. Nucleotide excision repair
    d. Exonucleolytic proofreading

17. A 54 years female patient gets admitted to the hospital with nausea, vomiting, pain abdomen. On examination yellowish discolouration of conjunctiva. History of passing clay coloured stools. Biochemical investigations are as follows
    Vandenbergh's reaction: Direct positive
    Total bilirubin: 15.6 mg/dL (0.2 – 1.2 mg/dL)
    Conjugated bilirubin: 13.4mg/dL (0.2 -0.4mg/dL)
    Unconjugated bilirubin: 1.8mg/dL (0.2 – 0.6 mg/dL)
    AST: 38IU/L ALT: 29IU/L ALP: 870 IU/L
    The probable diagnosis is
    a. Hepatic Jaundice
    b. Haemolytic Jaundice
    b. Porphyrias
    c. Obstructive Jaundice

18. An obese patient was admitted with acute myocardial infarction. The laboratory investigations revealed increased levels of Low density Lipoprotein Cholesterol (LDL-C).
    The function of LDL-C is to
    a. Transport Cholesterol from Peripheral tissues to the Liver
    b. Transport Cholesterol from Liver to the Peripheral tissues
    c. Transport Triglycerides from Peripheral tissues to the Liver
    d. Transport Triglycerides from Liver to the Peripheral tissues

19. A 12 year child was brought to the hospital with puffiness of face, pitting pedal odema, decreased urine output, fever and was treated with steroids and antibiotics. On examination, he was febrile, BP 140/94 mm Hg, pulse 92/min, regular. Biochemical evaluation revealed: urine proteins +++, serum albumin 2.0 g/dL, serum cholesterol 280 mg/dL, serum Creatinine 2.0 mg/dL, blood urea 120mg/dL. Serum electrophoresis showed increased alpha-2 band.
    a. Nephritis
    b. Nephrotic syndrome
    c. Acute renal failure
    d. Chronic renal failure

20. A 12- year girl is brought to the Emergency department. Mother gives a 2-day history of vomiting and abdominal pain. She is drowsy and her breathing is deep and rapid. There is distinctive smell from her breath. Her blood glucose is 600mg/dL and urine positive for ketone bodies. A diagnosis of type 1 diabetes mellitus was made and the girl was started on Injection Human insulin.

    This insulin is produced by:
    a. Hybridoma technology
    b. Transgenic animals
    c. Reverse Transcriptase Polymerase Chain Reaction
    d. Recombinant DNA technology