SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES & TECHNOLOGY
THIRUVANANTHAPURAM—695 011, INDIA.
(An Institute of National Importance under Govt.of India)
Phone—(91)0471—2443152 Fax—(91)0471—2446433, 2550728
Email-sct@sctimst.ac.in Web site—www.sctimst.ac.in

ROLL NUMBER

WRITTEN TEST FOR THE POST OF TECH.ASST. (LAB) – A To B

DATE: 25/09/2024 **TIME: 9.30 to 10.30 AM**

DURATION: 60 MINUTES **Total Marks: 50**

INSTRUCTIONS TO THE CANDIDATES

1. Write your Roll Number on the top of the Question Booklet and in the answer sheet.
2. Each question carries 1 mark.
3. There will not be any Negative Marking.
4. **Write legibly the alphabet of the most appropriate answer (A, B, C or D) in the separate answer sheet provided.**
5. Over-writing is not permitted.
6. Candidate should sign in the question paper and answer sheet.
7. No clarifications will be given.
8. Candidate should hand over the answer sheet to the invigilator before leaving the examination hall.

Signature of the Candidate

25/9/24.

Name of Post- Technical Assistant (Lab)-A to B (I MFCP)

1. **Which of the following types of anemia is caused by bone marrow failure?**
   A. Aplastic anemia
   B. Hemolytic anemia
   C. Pernicious anemia
   D. Iron deficiency anemia
2. **Which of the following is a marker for liver synthetic function?**
   A. Serum Bilirubin
   B. Prothrombin Time (PT)
   C. ALT
   D. GGT
3. **How long is the blood sample allowed to stand in the Westergren method to measure ESR?**
   A. 1 hour
   B. 2 hours
   C. 30 minutes
   D. 4 hours
4. **Which condition is associated with Hemoglobin S?**
   A. Thalassemia
   B. Hemolytic anemia
   C. Iron deficiency anemia
   D. Sickle cell anemia
5. **What color do eosinophils typically appear after a Wright's stain?**
   A. Blue
   B. Red/orange
   C. Green
   D. Yellow
6. **What is a major cause of pre-analytical errors in blood gas analysis?**
   A. Incorrect data interpretation
   B. Improper use of reagents
   C. Delay in sample processing
   D. Misreading the analyzer output
7. **What is the best solution to prevent contamination of urine samples during collection?**
   A. Using a non-sterile container
   B. Performing a midstream clean-catch technique
   C. Collecting the sample after eating
   D. Shaking the container before submission
8. **Which WBC type is primarily elevated in allergic reactions and parasitic infections?**
   A. Neutrophils
   B. Lymphocytes
   C. Monocytes
   D. Eosinophils
9. **Which of the following factors can lead to erroneous results if the sample is drawn while the patient is on IV fluids?**
   A. Sample dilution
   B. Hemoconcentration
   C. Incorrect labelling
   D. Sample clotting
10. **What is the primary use of a Leishman stain?**
    A. Detection of fungal infections
    B. Differentiate and identify leucocytes, malarial parasites and trypanosomes.
    C. Visualization of bone tissue
    D. Staining of muscle fibers
11. **How is a 1 M NaCl solution prepared (Mol. weight of NaCl is 58.44)?**
    A. Dissolve 1 gram of NaCl in 1 L of water
    B. Dissolve 100 grams of NaCl in 1 L of water
    C. Dissolve 58.44 grams of NaCl in 1 L of water
    D. Dissolve 1 mole of NaCl in 100 ml of water
12. **Which term describes the ability of a test to consistently produce the same result under the same conditions?**
    A. Accuracy
    B. Sensitivity
    C. Precision
    D. Specificity

13. If a dataset has a low coefficient of variation, this means:

A. The data points are highly variable relative to the mean
B. The mean value is very high
C. The data points are closely clustered around the mean
D. The data has a wide range of values

14. Which method is most accurate for measuring serum chloride levels?

A. Flame photometry
B. Mass spectrometry
C. Spectrophotometry
D. Ion-selective electrode (ISE)

15. Which of the following is a cause of anemia?

A. Vitamin B12 deficiency
B. More water intake
C. Lack of exercise
D. Overconsumption of fats

16. Which of the following may cause falsely low serum creatinine levels?

A. Excessive loss of water
B. Muscle wasting
C. Excessive protein intake
D. Hypertension

17. In which organ is erythropoietin produced ?

A. Heart
B. Liver
C. Kidney
D. Spleen

18. Which of the following conditions can lead to a decrease in serum albumin levels?

A. Dehydration
B. Acute liver failure
C. Polycythemia
D. Hyperlipidemia

19. Which of the following techniques can minimize the impact of temperature-sensitive analytes

A. Always store samples at room temperature
B. Keep all samples frozen
C. Use temperature-controlled transportation and storage
D. Ignore storage guidelines

20. Which laboratory test is commonly used to diagnose anemia?

A. White blood cell count
B. Hemoglobin level
C. Blood glucose test
D. Platelet count

21. A patient presents with fever, fatigue, and an elevated WBC count. Which disease is most commonly associated with a significantly elevated WBC count?

A. Diabetes
B. Leukemia
C. Hypertension
D. Asthma

22. A high monocyte count (monocytosis) is often associated with which type of diseases?

A. Chronic inflammatory diseases
B. Parasitic infections
C. Acute bacterial infections
D. Fungal infections

23. In a Levy-Jennings plot, the control limits are typically set at:

A. ±1 standard deviation
B. ±2 standard deviations
C. ±3 standard deviations
D. ±4 standard deviations

24. What is the primary clinical significance of an elevated ESR?

A. It indicates infection or inflammation
B. It suggests dehydration
C. It predicts cardiovascular disease
D. It signifies low blood pressure

25. What is the molarity of a solution that contains 0.5 moles of solute in 250 ml of solution?

A. 0.5 M
B. 1
C. 2 M
D. 0.2 M

26. Which protein is primarily responsible for increasing ESR during inflammation?

A. Hemoglobin
B. Albumin
C. Fibrinogen
D. Transferrin

27. Hemoglobinopathies are caused by mutations in genes that code for:

A. Alpha and beta globin chains
B. Gamma and delta globin chains
C. Iron transporters
D. Myoglobin chains

28. What is the function of methanol in blood smear staining?

A. To add color to the cells
B. To increase the smear's thickness
C. To stain red blood cells
D. To fix the blood smear

29. In Romanowsky staining, which component stains the nucleus of the cell?

A. Eosin
B. Methylene blue
C. Crystal violet
D. Safranin

30. 10% (w/v) solution of glucose means:

A. 10 grams of glucose in 100 grams of solvent
B. 10 moles of glucose in 100 ml of solution
C. 1 gram of glucose in 100 ml of solution
D. 10 grams of glucose in 100 ml of solution

31. Which of the following is NOT a component of the renal function test (RFT)?

A. Serum Creatinine
B. Blood Urea Nitrogen (BUN)
C. Albumin
D. Estimated Glomerular Filtration Rate (eGFR)

32. In immunoturbidimetry, what happens to the turbidity of a solution as the concentration of the analyte increases?

A. Decreases
B. Increases
C. Remains constant
D. Fluctuates randomly

33. What is the primary cause of iron-deficiency anemia?

A. Excess iron absorption
B. High iron intake
C. Decreased vitamin D levels
D. Blood loss

34. Which of the following enzymes is most often elevated in obstructive liver diseases such as cholestasis?

A. ALT
B. AST
C. Alkaline Phosphatase (ALP)
D. Lactate Dehydrogenase (LDH)

35. What is the structural difference between Hemoglobin A and Hemoglobin S?

A. Hemoglobin S has a valine substitution at the 6th position of the beta chain instead of glutamic acid
B. Hemoglobin S has an aspartic acid substitution at the 6th position of the beta chain instead of glutamic acid

C. Hemoglobin S has a lysine substitution at the 6th position of the beta chain instead of glutamic acid
D. Hemoglobin S has a serine substitution at the 6th position of the beta chain instead of glutamic acid

36. Which of the following tests is commonly used to assess serum bicarbonate (HCO_3^-) levels?
A. Blood gas analysis
B. Ion-selective electrode
C. Flame photometry
D. Spectrophotometer

37. Which electrolyte is essential for the neuromuscular function and cardiac muscle activity?
A. Sodium
B. Calcium
C. Magnesium
D. Phosphate

38. Which type of thalassemia involves a reduced production of alpha globin chains?
A. Alpha-thalassemia
B. Beta-thalassemia
C. Delta-thalassemia
D. Gamma-thalassemia

39. INR is used to monitor ...
A. Therapy for Diabetes
B. Therapy for High blood pressure
C. Warfarin therapy
D. Therapy for Hyperlipidemia

40. How is bicarbonate (HCO3-) level typically altered in metabolic acidosis?
A. Increases
B. Remains unchanged
C. Fluctuates
D. Decreases

41. In spectrophotometry, the Beer-Lambert Law relates:
A. Absorbance to temperature
B. Absorbance to concentration of the solute
C. Transmission of light to particle size
D. Wavelength to calorimetric changes

42. Which of the following is an advantage of using external quality control programs?
A. Enhanced ability to detect and correct issues with laboratory performance
B. Increased costs for the laboratory
C. Reduction in the number of quality control samples tested
D. Limited data on performance compared to internal controls

43. What is the ideal pH of the buffer used for Giemsa staining?
A. pH 5.0
B. pH 6.8
C. pH 7.4
D. pH 9.0

44. Which condition is most commonly associated with proteinuria?
A. Urinary tract infection
B. Dehydration
C. Diabetes mellitus
D. Hematuria

45. In which situation is serum electrophoresis most likely to be used for diagnostic purposes?
A. Monitoring blood pressure levels
B. Evaluating proteinuria
C. Investigating suspected protein abnormalities in blood
D. Measuring cholesterol levels

46. In an ELISA, what is the role of the enzyme?

A. To bind to the antigen
B. To catalyze a color change reaction
C. To precipitate the antigen
D. To neutralize the antigen

47. What principle does immunoturbidimetry rely on for measuring the concentration of an analyte?

A. Light scattering
B. Light absorption
C. Time of reaction
D. Color change

48. What is the primary purpose of calibrating laboratory instruments?

A. To extend the lifespan of the equipment
B. To increase the sample throughput
C. To improve accuracy and precision of measurements
D. To adjust the sensitivity of the tests

49. What is the normal adult hemoglobin molecule called?

A. Hemoglobin S
B. Hemoglobin A
C. Hemoglobin F
D. Hemoglobin C

50. Which term defines the closeness of a measured value to the true value?

A. Precision
B. Sensitivity
C. Specificity
D. Accuracy

Name of category: 1st MFCP-TA BIOCHEMISTRY

ANSWER KEY

1	A	21	B	41	B
2	B	22	A	42	A
3	A	23	C	43	B
4	D	24	A	44	C
5	B	25	C	45	C
6	C	26	C	46	B
7	B	27	A	47	A
8	D	28	D	48	C
9	A	29	B	49	B
10	B	30	D	50	D
11	C	31	C		
12	C	32	B		
13	C	33	D		
14	D	34	C		
15	A	35	A		
16	B	36	A		
17	C	37	B		
18	B	38	A		
19	C	39	C		
20	B	40	D		

25/9/24.