

**ROYAL CIVIL SERVICE COMMISSION
CIVIL SERVICE COMMON EXAMINATION (CSCE) 2008
EXAMINATION CATEGORY: TECHNICAL**

**PAPER III: SUBJECT SPECIALIZATION PAPER FOR:
LABORATORY TECHNOLOGY**

Date: 20/12/2008

Total Marks: 100

Examination Time: 2 .5 hours

Reading Time: 15 minutes

General Directions:

- 1. This question paper contains 6 pages. You will be given 15 minutes to read the questions before you write the answers.**
- 2. Section A, Part A should be answered on the question paper itself. Answers for Section A, Part B and Section B should be written on the separate answer sheets provided.**

SECTION A

PART A. MULTIPLE CHOICE QUESTIONS

Directions:

In this part there are thirty multiple choice questions each carrying 1 mark.

Each question is followed by four suggested answers. Tick/Circle the **ONE** that best answers the question

1. Bacteria that make either a fermentative or a respiratory set of enzymes are known as
 - a. Obligate aerobes
 - b. Obligate anaerobes
 - c. Micro-aerophilic
 - d. Facultative anaerobes

2. Bacteria that grow at temperature as high as 50° C are known as
 - a. Psychrophiles
 - b. Thermophiles
 - c. Mesophiles
 - d. Halophiles

3. Anti-Streptolysins are produced by
 - a. Styphylococci
 - b. Streptococci
 - c. Salmonella
 - d. None of the above

4. Which of the following organisms are non motile
 - a. *Salmonella typhi*
 - b. *Proteus mirabilis*
 - c. *Klebsiella pneumoniae*
 - d. *Escherichia coli*

5. The primary route of transmission of *E. coli* O157:H7 is through the:
 - a. Consumption of contaminated meat
 - b. Aerial transmission from infected persons through aerosols
 - c. Consumption of contaminated vegetables
 - d. Transfusion of contaminated blood

6. The following enzyme is an indicator of liver damage during toxic viral hepatitis
 - a. Alanine transaminase (ALT)
 - b. Lactate dehydrogenase (LDH)
 - c. Creatine kinase (CK)
 - d. Glucokinase

7. Enzymes with different physical properties but catalyzing the same characteristic reactions are known as
 - a. Catalysts
 - b. Isoenzymes
 - c. Proteins
 - d. Co-factors

8. In the process of DNA replication, genetic information of the cell is carried by
 - a. tRNA
 - b. sRNA
 - c. mRNA
 - d. all of the above

9. The translation of amino acid sequence to proteins is carried out by
 - a. DNA polymerase
 - b. Taq polymerase
 - c. Ribosomes
 - d. RNase

10. Which of the following are truly involuntary muscles of our body
 - a. Biceps
 - b. Muscles of the legs
 - c. Eye lid muscles
 - d. Heart muscles

11. The smallest blood vessels that form a network in all the organs and tissues of the body are called
 - a. Arteries
 - b. Arterioles
 - c. Venules
 - d. Capillaries

12. Insulin is synthesized and secreted by
 - a. Adrenal gland
 - b. Duodenum
 - c. Liver
 - d. None of the above

13. The process of synthesis of Glycogen from Glucose is called
- Gluconeogenesis
 - Glycogenesis
 - Glycogenolysis
 - None of the above
14. The primary structure of proteins are composed of an arrangements of
- Nucleic acids
 - Amino acids
 - Monosaccharides
 - Lipoproteins
15. Which of the following are conjugated proteins
- Albumin
 - Globulin
 - Haemoglobin
 - All of the above
16. Xerophthalmia is a disorder that is caused by the deficiency of the following
- Carbohydrates
 - Proteins
 - Vitamin A
 - Vitamin K
17. Bile is manufactured and secreted by
- Bile duct
 - Gall bladder
 - Liver
 - Duodenum
18. Neurons are the functional components of
- Kidney
 - Heart
 - Brain
 - Adrenal Gland
19. Which of the following immune cells produce antibodies
- Macrophage
 - T-cells
 - B-cells
 - Natural Killer (NK) cells
20. Which of the following is the first immunoglobulin to appear following an infection
- IgG
 - IgM
 - IgD

- d. IgE
21. Which of the following is not an auto-immune disease
- Systemic lupus erythematosus (SLE)
 - Rheumatoid arthritis (RF)
 - Bovine serum encephalopathy (BSE)
 - Rheumatic heart disease (RHD)
22. In malarial parasites, the sexual life cycle occurs in
- Female *Anopheles* mosquito
 - Human host
 - Both of the above
 - None of the above
23. The scientific name of round worm is
- Wuchereria bancrofti*
 - Ascaris lumbricoides*
 - Ancylostoma duodenale*
 - Trichuris trichiura*
24. In our cell, which electrolytes are primarily extracellular
- Na⁺
 - K⁺
 - None of the above
 - All of the above
25. Which of the following nucleic acids are double stranded
- DNA
 - RNA
 - mRNA
 - None of the above
26. Which of the following are the functional components of the kidney
- Nephrons
 - Neurons
 - Ganglia
 - None of the above
27. The principal vector for Dengue is:
- Anopheles gambiae*
 - Ochlerotatus triseriatus*
 - Aedes aegypti*
 - Culex spp.*
28. Which of the following diseases does not have a vaccine?
- Hepatitis B
 - HIV infection
 - Polio
 - Measles

29. Which of the following equipment is used for manual counting of blood cells in body fluids?
- (a) Haemoglobinometer
 - (b) Spectrophotometer
 - (c) Haemocytometer
 - (d) Colorimeter
30. A high neutrophil count indicates probable infection by
- (a) Bacteria
 - (b) Fungi
 - (c) Parasites
 - (d) Viruses

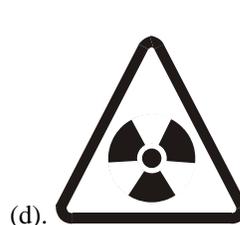
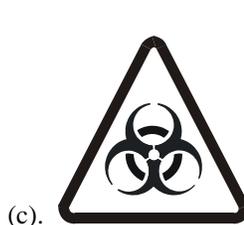
PART B. WRITE SHORT ANSWERS

(20 marks)

General Direction:

In this part there are four short answer questions each carrying 5 marks. All the questions must be attempted.

1. What is the function of insulin? Describe the disorder that is caused by the deficiency of insulin in the body. (5)
2. What do you mean by an immuno-compromised host? Explain what are the possible factors that lead to immune suppression? Give an example of an important immune deficiency disease. (5)
3. The following are popular vaccine/vaccines combinations, what do they stand for? (5)
 - BCG :
 - DPT :
 - MMR :
 - OPV :
4. What do the following warning symbols stand for? (5)



SECTION B

(50 marks)

General Direction:

In this section there are two questions related to a case study. Choose **ANY** one question from the questions below and write your answer to the chosen question very carefully.

1. A 59 year-old man working in an asbestos factory, with a history of occasional alcohol consumption was admitted to the hospital with jaundice and swelling in the right upper hypochondrium. On examination it was found that he had an enlarged liver. Laboratory investigation revealed the following:
 - a. Serum bilirubin >4.0 mg/dl (Increased)
 - b. Serum alkaline phosphate (ALP) : 200 IU/L (Increased)
 - c. Serum aspartate aminotransferase (AST) : 115 IU/L (Increased)
 - d. Serum GGT: normal
 - e. Urine bilirubin: Positive
 - f. Serum for Hepatitis B and C : Negative
 - g. USG report: Enlarged liver

Based on the available data, what do you think could have led to the liver disorder in this patient?

What are the other common causes of liver diseases? What are the common laboratory tests used to investigate liver disorders.

2. A 72 year-old man admitted over the last 3 months in surgical ward presented with repeated infection of the ambulatory wound in the right leg. Treatment with various broad spectrum antimicrobial agents did not resolve the infections. Pus culture from the wound swab showed glucose non-fermentative colonies on MacConkey agar. Biochemical characterization showed oxidase positive with green pigmentation. Antibiotic susceptibility testing showed resistance to most drugs including 3rd generation cephalosporins like ceftriaxone and ceftazidime. Based on the available data, which of the following etiologic agent do you think poses threat to this patient's health?
 - a. *Escherichia coli*
 - b. *Klebsiella pneumoniae*
 - c. *Pseudomonas aeruginosa*
 - d. *Neisseria gonorrhoeae*

Give your own explanation as to why this organism developed resistance to broad spectrum antimicrobial agents.