ROYAL CIVIL SERVICE COMMISSION
CIVIL SERVICE COMMON EXAMINATION (CSCE) 2009
EXAMINATION CATEGORY: TECHNICAL

PAPER III: SUBJECT SPECIALIZATION PAPER FOR: LABORATORY TECHNOLOGY

Date: 04/11/2009
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. **All answers should be written on the Answer paper.**

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. Choose **ONE** that best answers the question.

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1. Influenza is caused by a
   a. Bacteria
   b. Fungi
   c. Virus
   d. None of the above

2. Which of the following is a gram positive bacteria
   a. E. coli
   b. Proteus mirablis
   c. Salmonella typhi
   d. Staphylococcus aureus

3. Toxic shock syndrome is a disease caused by a toxin produced by
   a. Staphylococcus aureus
   b. Streptococcus neoformans
   c. Streptococcus pyogenes
   d. Staphylococcus albus

4. Thermophilic bacteria grow well in an environment that has
   a. High salt content
   b. High temperature
   c. Low light
   d. Strong sunlight

5. In statistics, a Gaussian distribution is also called a
    a. Binomial Distribution
    b. Prussian Distribution
    c. Normal curve
    d. None of the above

6. Heating at high temperature under high pressure is called
    a. Steaming
    b. Disinfection
    c. Autoclaving
    d. Distillation

7. When a disease affects many countries of the world, it is called an
    a. epidemic
    b. endemic
    c. pandemic
    d. outbreak

8. Haemophiliacs lack the clotting factor
    a. Fibrinogen
    b. Factor V
    c. Factor VIII
    d. Platelets

9. Currently an influenza pandemic is underway, caused by
    a. Influenza A(H1N1)
    b. Influenza A(H5N1)
    c. Influenza B
    d. Parainfluenza virus

10. Human Immunodeficiency Virus can be transmitted through
    a. Mosquito bites
    b. Aerial transmission from infected persons through aerosols
    c. Touching and holding hands
    d. Transfusion of contaminated blood

11. Cyanotic and diaphoretic mean
    a. Blue and sweaty
    b. Yellow and hot
    c. Blue and gasping for breath
    d. Gasping for air and bleeding from both nostrils

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

13. 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

14. Sickle cell anaemia confers protection against
    a. Malaria infection
    b. HIV infection
    c. Rabies infection
    d. Hepatitis B infection

15. 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

16. 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

17. Thyroid Stimulating Hormone is produced by the
    a. Thyroid gland
    b. Pituitary gland
    c. Liver
    d. None of the above

18. The process of synthesis of Glycogen from Glucose is called
    a. Gluconeogenesis
    b. Glycogenesis
    c. Glycogenolysis
    d. None of the above

19. The primary structure of proteins are composed of an arrangements of
    a. Nucleic acids
    b. Amino acids
    c. Monosaccharides
    d. Lipoproteins

20. Clostridium tetani is extremely dangerous because
    a. it can grow in the absence of air
    b. it can cause gangrene
    c. it produces a neurotoxin
    d. it is a spore forming organism

21. Vitamin A prevents
    a. Xeropthalmia
    b. Haemophilia
    c. Liver cirrhosis
    d. Cancer

22. Why are women more susceptible to UTI's than men?
    a. they are more sexually active
    b. they have shorter urethras
    c. the lactobacilli in their vaginas make them more susceptible
    d. none of the above

23. Which bacterium is associated almost exclusively with antibiotic-associated diarrhoea?
    a. Staphylococcus aureus
    b. Candida albicans
    c. Clostridium perfringins
    d. Clostridium difficile

24. Which of the following immune cells produce antibodies
    a. Macrophage
    b. T-cells
    c. B-cells
    d. Natural Killer (NK) cells

25. Which of the following immunoglobulin counteracts parasitic infection
    a. IgG
    b. IgM
    c. IgD
    d. IgE

26. Which of the following is an auto-immune disease
    a. Systemic lupus erythematous (SLE)
    b. Cerebral Palsy
    c. Bovine serum encephalopathy (BSE)
    d. Rheumatic heart disease (RHD)

27. Which of the following mosquitos is the malaria vector
    a. *Anopheles gambiae*
    b. *Ochlerotatus triseriatus*
    c. *Aedes aegypti*
    d. *Culex spp.*

28. Which of the following diseases does not have a vaccine?
    a. Hepatitis B
    b. HIV infection
    c. Polio
    d. Measles

29. What is the most common cause of pharyngitis?
    a. Epstein Barr virus
    b. Streptococcus pyogenes
    c. Streptococcus pneumoniae
    d. Candida albicans

30. Lymphocyte count will be raised in an 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. The pentavalent vaccine was recently in the news for having been withdrawn. Against which diseases did this vaccine confer immunity (5)

2. Name the 5 hepatitis viruses and their main routes of transmission. (5)

3. Name 3 medically important fungi and the diseases they cause. (5)

4. How is HIV transmitted? Name some prevention methods. (5)

SECTION B (50 marks)

General Direction:
In this section there are two questions related to a case study. Choose <u>ANY one</u> question from the questions below and write your answer to the chosen question very carefully.

CASE STUDY 1

This case is about a veterinarian who owned a 150 litre aquarium and had quite a collection of fresh water fish. His tank also contained fresh plants and "real rocks" that tended to grow slime.

While cleaning his tank one day, he cut his finger with the rough edge of the rock. His finger became infected within several days. Topical antibiotics did not seem to be effective and the infection grew progressively worse. Drainage from the wound site were taken and sent to the laboratory for smear and culture. Routine cultures yielded negative results.

1) Based on the information provided how would you go about investigating the infection?

2) What types of agents would you include in your suspect list?

3) Why did you suspect such agents?

4) How do you think he acquired the infection?

5) How would you proceed with the laboratory diagnosis of this infectious disease?

CASE STUDY 2 (BLOOD BANK)

A group "A" man marries a group "AB" woman. The man's father is group "O."

1. What are the possible ABO groups of children produced from this mating?

2. The woman is Rh negative and the man is Rh positive. The man's mother was also Rh negative. What is the chance that their offspring will be Rh negative?

3. Because the pregnancy is high risk, the woman wants her husband to donate blood for her. Give 2 reasons why this is not a good idea.

During the pregnancy, the woman experienced a fetomaternal bleed and was given Rh immune globulin. Post delivery, she is re-evaluated and it is found that she has developed a weak Anti-D and an Anti-E.

4. Is she a candidate for Rh immune globulin now?

5. What could be done to aid in determining this?