

**ROYAL CIVIL SERVICE COMMISSION  
BHUTAN CIVIL SERVICE EXAMINATION (BCSE) 2023  
EXAMINATION CATEGORY: TECHNICAL**

**PAPER III: SUBJECT SPECIALISATION PAPER FOR PUBLIC HEALTH**

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<b>Date</b>	: October 7, 2023
<b>Total Marks</b>	: 100
<b>Writing Time</b>	: 150 minutes (2.5 hours)
<b>Reading Time</b>	: 15 minutes (prior to writing time)

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**GENERAL INSTRUCTIONS:**

1. Write your Registration Number clearly and correctly on the Answer Booklet.
2. The first 15 minutes is to check the number of pages of Question Paper, printing errors, clarify doubts and to read the instructions. You are NOT permitted to write during this time.
3. This paper consists of **TWO SECTIONS**, namely SECTION A & SECTION B:
  - **SECTION A** has two parts: Part I - 30 Multiple Choice Questions  
Part II - 2 Short Answer Questions  
All questions under SECTION A are **COMPULSORY**.
  - **SECTION B** consists of two Case Studies. Choose only **ONE** case study and answer the questions of your choice.
4. All answers should be written on the Answer Booklet provided to you. Candidates are not allowed to write anything on the question paper. If required, ask for additional Answer Booklet.
5. All answers should be written with correct numbering of Section, Part and Question Number in the Answer Booklet provided to you. Note that any answer written without indicating the Section, Part and Question Number will NOT be evaluated and no marks will be awarded.
6. Begin each Section and Part on a fresh page of the Answer Booklet.
7. You are not permitted to tear off any sheet(s) of the Answer Booklet as well as the Question Paper.
8. Use of any other paper including paper for rough work is not permitted.
9. **You must hand over the Answer Booklet to the Invigilator before leaving the examination hall.**
10. This paper has **9 printed pages**, including this instruction page.

**GOOD LUCK**

SECTION A

PART I: Multiple Choice Questions [30 marks]

Choose the correct answer and write down the letter of your chosen answer in the Answer Booklet against the question number e.g. 31 (d). Each question carries ONE mark. Any double writing, smudgy answers or writing more than one choice shall not be evaluated.

1. Which model for health is represented by the following statement:  
“Vaccines have the same physiologic mechanism whether administered in the United States or Bhutan. This is why they work, why they have led to a global reduction in vaccine-preventable illnesses such as measles and polio.”
  - a) Sociocultural Model
  - b) Universal Coverage Model
  - c) Biomedical Model
  - d) Primary Care Model
  
2. Which of the following determinants of health can be associated with alcohol and tobacco use and abuse?
  - a) Political stability
  - b) Exposure to mass media
  - c) Poor sanitation
  - d) Malnutrition
  
3. Which statement best describes about the global epidemiology and burden about NCDs?
  - a) Globally, cardiovascular diseases account for most NCD deaths annually, followed by cancers, respiratory diseases and diabetes.
  - b) Globally, cancers account for most NCD deaths annually, followed by cardiovascular diseases, respiratory diseases and diabetes.
  - c) Globally, diabetes account for most NCD deaths annually, followed by cardiovascular diseases, respiratory diseases and cancers.
  - d) Globally, respiratory diseases account for most NCD deaths annually, followed by cardiovascular diseases, cancers and diabetes.
  
4. All of the following are the *modifiable risk factors* contributing to NCDs **EXCEPT**
  - a) Unhealthy diet
  - b) Raised blood pressure
  - c) Tobacco use
  - d) Physical inactivity
  
5. Choose the most appropriate statement about evolving model of care for NCDs.
  - a) Geared towards acute conditions
  - b) Doctor dependent and hospital centered
  - c) Patient as passive recipient
  - d) Team based continuous care with patient as a partner

6. Head and neck cancers are the third most common cancer in Bhutan. What are the most common modifiable risk factors within Bhutan's context for these cancers?
  - a) Tobacco use, betel nut, and alcohol usage
  - b) Tobacco use, physical inactivity, and unhealthy diet
  - c) Family history, excessive salt intake and betel nut consumption
  - d) Both (a) and (c)
  
7. Mental health disorder is recognized as one of the major public health issues today. Which of the following are major determinants of mental health disorder?
  - a) Socioeconomic factors
  - b) Genetic factors
  - c) Family and working environment
  - d) All of the above
  
8. The notifiable diseases for surveillance and reporting in Bhutan was first recommended in one of the National Health conferences to then then Public Health Laboratory. What was the year of this conference?
  - a) 2009
  - b) 2002
  - c) 2007
  - d) 2016
  
9. The level of prevention in which the emergence of risk factors of a chronic disease in a population is prevented is called
  - a) Primary prevention
  - b) Primordial prevention
  - c) Secondary prevention
  - d) Tertiary prevention
  
10. In terms of costs, what is/are the best buys for NCDs response?
  - a) Invest in both population and individual measures
  - b) Take actions on risk factors particularly tobacco
  - c) Adopt integrated primary care approach
  - d) All of the above
  
11. The strategy for *primary level of prevention* for Rheumatic Health Disease (RHD) is to
  - a) treat RHD with heart failure medication and anti-coagulation.
  - b) treat Group A Streptococcal Infection (GAS) pharyngitis with antibiotics.
  - c) treat Acute Rheumatic Fever with injection Benzathine Penicillin.
  - d) perform surgery for valve repair or replacement.
  
12. What percentages of cancers are preventable through primary level intervention?
  - a) 20 %
  - b) 40%
  - c) 60%
  - d) 75%

13. Identify a pair of cancers with a risk factor related to infectious agents from the following.
- Lungs and Liver cancers
  - Cervical and Breast Cancers
  - Stomach and Cervical Cancers
  - Head and Neck cancers
14. What should be included for the Primary Health Centre (PHC) monitoring program in service with care and compassion?
- The team should visit the health facility without prior notice to the PHC staff.
  - The team should only talk with the staff trained on PEN HEARTS and leave out other staff of the PHC.
  - Observe and assess the services using the standard checklist.
  - Conduct a debriefing of the visit after a week.
15. An adverse effect of a preventive, therapeutic or diagnostic procedure which causes disability or death is called
- Nosocomial infection
  - Iatrogenic disease
  - Opportunistic infection
  - Sequelae
16. \_\_\_\_\_ refers to the work of health care professionals who act as a first point of consultation for all patients within the health care system?
- Primary care
  - Secondary care
  - Urgent care
  - None of the above
17. Which of the following is **TRUE** about the International Health Regulation (IHR 2005)?
- The IHR (2005) aim to prevent, protect against, control and respond to the international spread of disease.
  - IHR avoids unnecessary interference with international traffic and trade.
  - The responsibility for implementing the IHR (2005) rests upon all the member States.
  - All of the above
18. Virulence is an agent characteristic which refers to
- the ability to infect susceptible host.
  - a measure of the degree of disease that a pathogen causes.
  - a degree of organism to cause clinical disease.
  - the proportion of exposed persons who become infected.
19. The time period between exposure of host to until it becomes infectiousness is termed as
- Infectious period
  - Latent period
  - Incubation period
  - Susceptibility period

20. In the multifactorial disease causation theory, which of the following is NOT true of the necessary cause?
- Infectious diseases always have necessary causes
  - Lung cancer is NCD and do not always have necessary cause
  - It is commonly observed that one necessary cause is also a sufficient cause all by itself
  - In genetic disorder like Down's syndrome, the chromosomal abnormality is necessary and sufficient cause by itself
21. Factor A, B or C can each individually cause a certain disease without the other two factors, but only when followed by exposure to factor X. Exposure to factor X alone is not followed by the disease, but the disease never occurs in the absence of exposure to factor X. Factor X is
- a necessary and sufficient cause.
  - a necessary but not sufficient cause.
  - a sufficient, but not necessary cause.
  - neither necessary nor sufficient.
22. The significance of statistical association observed between exposure and outcome variables in epidemiological studies depends on the following factors **EXCEPT**
- Magnitude of the difference
  - Variability of the difference
  - Sample size
  - All of the above
23. Which of the following is **NOT** the Bradford-Hill criteria used in assessment to establish causal inference between exposure and outcome?
- Systemic relationship
  - Experimental evidence
  - Dose-response relationship
  - Specificity of association
24. Amongst the epidemiological study design, which of the following provides the strongest evidence for causality between a risk factor and outcome?
- Ecological studies
  - Case-control studies
  - Cohort study
  - Case series
25. A researcher plans to study about disease X and possible risk factors in one community. The disease X is not common occurrence in the community and epidemiological information on the disease is limited. What type of study design will be the most appropriate to answer this research question?
- Case-control
  - Case series
  - Clinical trial
  - Cohort design

26. Which of the following is **NOT TRUE** about measure of health or disease frequency?
- Incidence risk also known as cumulative incidence is a measure of the probability that an individual person will develop a disease in a defined time period.
  - Prevalence count is the number of individuals in a population that have disease at a particular time.
  - Attack rate is incidence rate used to describe the frequency of disease in outbreak situations.
  - Case fatality rate is really a risk measure (proportion) instead of a rate.
27. In epidemiological studies, the strength of association between an exposure and a disease is usually expressed using a “relative effect” measure. Which of the following statement is **CORRECT** about measure of association?
- Odds Ratio (OR) is a measure of association which can be used for only case-control study type.
  - Risk Ratio is a measure of association which says nothing about how much disease is occurring in the population.
  - Risk ratio is a measure of association which can be used in cohort studies, case-control and cross-sectional studies.
  - Incidence rate ratio is also a relative effect measure which can range between -1 to  $\infty$  (Infinity).
28. Choose the option that is **NOT** a source of data used for public health surveillance.
- Administrative data systems
  - Disease notifications
  - Vital records
  - Newspaper articles
29. All of the following are **TRUE** about the national HIV/AIDS prevention and control program **EXCEPT**
- Community-based testing using HIV self-testing kits is introduced to reach the untested and undiagnosed people.
  - The case detection gap for HIV has been reduced from 47.6% in 2019 to 15% in in December 2022 (32.7%).
  - The provider Initiated HIV counselling and testing services for HIV are provided through health facilities.
  - The medical screening has been the main mode for diagnosis for people with HIV infection.
30. The WHO NTD roadmap 2021-2030 identify 20 disease or disease group as Neglected Tropical diseases (NTD) that mainly affect the poor and those living in poverty. All of the following are important NTDs present in Bhutan **EXCEPT**
- Soil Transmitted Helminths
  - Chagas disease
  - Visceral Leishmaniasis
  - Snake bites envenomation

**PART II – Short Answer Questions [20 marks]**

**This part has Short Answer Questions. Answer ALL the questions. Mark for each sub-question is indicated in the brackets.**

**Question 1**

The Royal Center for Disease Control (RCDC) under the Ministry of Health is the designated national focal point for management of *National Early Warning, Alert and Response Surveillance system (NEWARS)*. The NEWARS system is based on both the indicator and event based surveillance. In relation to this, answer the following questions;

- a) Define what do you understand by “*Indicator-based surveillance*” and “*Event-based surveillance*”? And give one disease or health event each as example. (2.5 x 2= 5marks)
- b) How many reportable diseases/syndromes are currently there in the NEWARS system? (1marks)
- c) How many of the reportable diseases/syndromes are there as weekly notifiable? (1 mark)
- d) How many of the reportable diseases/syndromes are there as immediately notifiable? (1 mark)
- e) Describe two attributes that should be there in a good public health surveillance system? (1x2= 2 marks)

**Question 2**

**Instruction: Fill up the blanks with correct answers in the space provided. (1x10 =10 marks)**

- a) Public Health Surveillance is the \_\_\_\_\_ , \_\_\_\_\_ collection, analysis, and interpretation of health-related data. (2 marks)
- b) The three classical symptoms of diabetes are polyuria, polyphagia and \_\_\_\_\_(1 mark)
- c) \_\_\_\_\_ is the result of undernourishment, poor absorption and/or poor biological use of nutrients consumed. (1 mark)
- d) If the recruitment quarter of a cohort is October-December 2021, then the assessment quarter will be \_\_\_\_\_ and the reporting month will be on July 2022. (1mark)
- e) In data analysis and interpretation, by identifying the \_\_\_\_\_ , \_\_\_\_\_ and \_\_\_\_\_ , we can more easily determine how and why the health event occurred (3 marks)
- f) \_\_\_\_\_ is considered the model One Health zoonosis that can be used to promote collaborative approaches for its prevention and control between human, animal and environmental sectors. (1mark)
- g) Bhutan achieved WHO certification for elimination of endemic rubella in the year \_\_\_\_\_ (1 mark)

**SECTION B: Case Study [50 marks]**

**Choose either CASE I OR CASE II from this section. Each case study carries 50 marks. Mark for each sub-question is indicated in the brackets.**

**CASE I**

**Question 1**

Infectious diseases have for centuries ranked with wars and famine as major challenges to human progress and survival. They remain among the leading causes of death and disability worldwide. Emerging Infectious Diseases (EIDs) continue to pose serious public health threats globally and South Asia is considered “hotspots” for EIDs. The WHO has warned in its 2007 report that infectious diseases are emerging at a rate that has not been seen before. Since the 1970s, about 40 infectious diseases have been discovered, including SARS, MERS, Ebola, chikungunya, avian flu, swine flu, Zika and most recently COVID-19, caused by a new coronavirus, SARS-CoV-2.

- a) Define what do you understand by the term “*Emerging Infectious Diseases*”? Give two causes of EIDs? (3+2 = 5 marks)
- b) Majority of the EIDs are zoonosis that has its origin in domestic or wild animals. What are the key drivers (factors) that contribute to the emergence of zoonotic EIDs? Briefly elaborate and explain how each of the identified factors lead to EIDs? (5 x 2=10 marks)
- c) List down and describe five main public health strategies and interventions that can be deployed for prevention and control of EIDs? (2 x 5=10 marks)

**Question 2**

The EIDs pose continued public health threats that can extend beyond the borders of one country. The International Health Regulations (IHR) grew out of the response to deadly infectious disease epidemics that once overran whole of Europe. The IHR are an instrument of international law that is legally-binding on 196 countries, including the 194 WHO Member States. They create rights and obligations for countries, including the requirement to report public health events. The Regulations also outline the criteria to determine whether or not a particular event constitutes a “Public health emergency of international concern”, as was followed by WHO during global COVID19 pandemic response and management.

- a) Which three diseases were included in the International Health Regulations from 1969? (3x1= 3 marks)
- b) Define what do you understand by the term *Public Health Emergency of International Concern* (PHEIC)? (4 marks)
- c) List down the five most recent PHEICs as declared by WHO? (1x5= 5 marks)
- d) Describe briefly the 10 of the 13 core areas for capacity building that are identified under IHR (2005) for implementation and evaluation by WHO member countries? And also explain how it contributes to meeting IHR objectives. (1x10= 10 marks)
- e) Who is the National IHR focal Point designated under Ministry of Health in Bhutan? Name other two key stakeholders that are responsible for IHR implementation, along with MoH? (1x3= 3 marks)



**CASE II**

After almost 60 years since the failed global malaria eradication program, eliminating malaria by 2030 was reaffirmed and adopted as a global Sustainable Development Goal in 2015. To guide countries in their efforts, the World Health Organisation (WHO) developed a comprehensive Global Technical Strategy (GTS) for malaria elimination 2016–2030 and set an ambitious global target to reduce global malaria incidence and mortality by at least 90%. WHO has identified many countries in Asia Pacific region with potential to eliminate malaria. Bhutan is one of the countries in this special initiative called “E-2025 countries” that are set for WHO certification for malaria elimination by 2025. The revised National Strategic Plan for Malaria Elimination and Prevention of Re-introduction 2020-2025 has aligned targets to interrupt indigenous malaria transmission in the country by 2022 and obtain WHO malaria-free certification by 2025.

1. Define the following terminologies used in the context of disease control. Give one example each of the disease that has been eradicated or eliminated. (2.5x2 = 5 marks)
  - a) Eradication
  - b) Elimination
2. The updated version of *Global technical strategy for malaria 2016–2030* was endorsed by the World Health Assembly in May 2021 which reflects lessons learned in the global malaria response over the last 5 years, including from the setbacks and experience of COVID19 pandemic response. Briefly describe the **three pillars and two supporting elements** that are identified in this strategic plan to guide global malaria efforts to move closer to malaria elimination? (5x3=15 marks)
3. Many elimination strategies are designed and implemented by the malaria program under MoH to achieve the elimination goal. Describe the four key anti-malarial interventions that are implemented in Bhutan to achieve the elimination goal. Discuss in your answer how each of the intervention applied for elimination phase should be different from the control phase to not only expedite the elimination process but also to sustain the program in post-elimination phase? (4x5 = 20 marks)
4. Identify the two major challenges that impede malaria elimination efforts in Bhutan. Elaborate the possible strategies/solutions that you consider will help to address the challenges faced in the elimination program? (2x5= 10 marks)

**TASHI DELEK**