

**ROYAL CIVIL SERVICE COMMISSION  
BHUTAN CIVIL SERVICE EXAMINATION (BCSE) 2019  
EXAMINATION CATEGORY: TECHNICAL**

**PAPER III: SUBJECT SPECIALISATION PAPER FOR ENVIRONMENTAL SCIENCE**

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<b>Date</b>	: October 13, 2019
<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 - 4 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 in 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 are required to hand over the Answer Booklet to the Invigilator before leaving the examination hall.**
10. This paper has **7 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. When Chlorofluorocarbons are released into the atmosphere, chlorine chemical destroys the
  - a) Beta molecules
  - b) Helium molecules
  - c) Argon molecules
  - d) Ozone molecules
  
2. The Royal Government of Bhutan designated its first protected area, the Manas Wildlife Sanctuary in
  - a) 1952
  - b) 1966
  - c) 1969
  - d) 1974
  
3. Gene frequency, gene flow, population density, age distribution, over population are attributes of
  - a) Community
  - b) Population
  - c) Groups
  - d) Individuals
  
4. Oxygen which is released during the process of photosynthesis comes from
  - a) Hydrogen
  - b) Leaves
  - c) Water
  - d) Oxygen
  
5. Type of respiration which humans adopt in severe physical activities is
  - a) Aerobic
  - b) Anerobic
  - c) Fermentation
  - d) Accumulation
  
6. Exchange of gases between organisms and environment is termed as
  - a) Internal respiration
  - b) External respiration
  - c) Respiration
  - d) Acquired respiration

7. Human beings can hear range of sound frequency between
  - a) 20 - 20,000 Hertz
  - b) 10 - 1,000 Hertz
  - c) 1 - 100 Hertz
  - d) 1 - 7 Hertz
  
8. First International Conference on environment was held in
  - a) March, 1968
  - b) March, 1970
  - c) June, 1970
  - d) June, 1972
  
9. Sound becomes hazardous noise pollution at decibels
  - a) above 50
  - b) above 80
  - c) above 100
  - d) above 130
  
10. Invasive species are able to survive and thrive in a new environment because of all of the following EXCEPT
  - a) The ability to travel long distances.
  - b) The increased risk of predation.
  - c) The decreased threat of disease.
  - d) The ability to outcompete native species.
  
11. Species that fulfill a narrow niche and depend on specific requirements for survival are considered
  - a) Generalists
  - b) Specialists
  - c) Survivors
  - d) None of the above.
  
12. Which part of the ocean contains most of its primary productivity?
  - a) Benthic zone
  - b) Abyssal zone
  - c) Intertidal zone
  - d) Photic zone
  
13. What is the difficulty when conducting a cost-benefit analysis relating to an environmental action?
  - a) Benefits usually outweigh costs.
  - b) The environmental costs and benefits associated with an action cannot necessarily be quantified.
  - c) The benefits are usually exceptionally high with respect to costs.
  - d) The costs and benefits of an environmental action cannot be assessed.

14. Potential threats of biodiversity as a result of climate change include all of the following EXCEPT
- An increase in drought in some regions.
  - The possibility that glaciers will increase in size.
  - An increase in global average surface temperature.
  - The possibility that specialized species may perish.
15. Soil degradation is an increasing global problem. Two main reasons for soil degradation are
- Agriculture and Deforestation
  - Industrialization and Deforestation
  - Overgrazing and Climate change
  - Climate change and Agriculture
16. In which of the following ecosystems do tree roots serve as important havens for biodiversity?
- Coral reefs
  - Mangrove forests
  - Estuaries
  - Freshwater wetlands
17. A resource manager attempts to harvest as many trees as possible without depleting the overall supply. This application is the concept of
- Selective management
  - Maximum sustainable yield
  - Adaptive management
  - Ecosystem-based management
18. Often endemic species is more prone to extinction than other species because it
- is endangered.
  - is found only in one location on the planet.
  - is an introduced species.
  - has a limited food source.
19. How can asbestos be harmful to humans?
- Asbestos binds to hemoglobin and blocks oxygen from binding, preventing oxygen from circulating in the blood.
  - Asbestos acts as an endocrine disruptor.
  - Asbestos lodges in the lining of the lungs, provoking the production of acid to destroy the invader, but over time it can potentially lead to cancer.
  - Asbestos can be absorbed into the blood, potentially poisoning the body.
20. In which year was the first environment related Act enacted by the National Assembly of Bhutan?
- 1952
  - 1969
  - 1974
  - 1995

21. Which of the following is most responsible for world water crisis?
- Dams
  - Floods
  - Drought
  - Population growth
22. One of the Ramsar site designated in Bhutan is located at
- Phobjekha
  - Punatsangchhu
  - Amochhu
  - Wangchhu
23. In which year was the first Biodiversity Action Plan developed as a framework to improve conservation and sustainable utilization of Bhutan's natural biodiversity?
- 1994
  - 1995
  - 1996
  - 1997
24. The major reservoir of carbon is
- the atmosphere.
  - ocean bed.
  - plant and animals.
  - rock.
25. What is edge species?
- The species which occur abundantly in the ecotone.
  - Species on the verge of extinction.
  - Rare species.
  - Endemic species.
26. An example of one ecological cycle is
- Carbon dioxide cycle
  - Water cycle
  - Energy cycle
  - Oxygen cycle
27. "Silent Spring" is a well-known book written by
- John Miller
  - Charles Darwin
  - Aldoleopold
  - Rachel Carson
28. Many wild plant and animals are on the verge of extinction due to
- Habitat destruction
  - Climate change
  - Urbanization
  - None of the above.

29. The first global environmental protection treaty “the Montreal Protocol” was signed on September 26,.....
- 1981
  - 1985
  - 1987
  - 1990
30. In Bhutan, the blue pine forest is found in the altitude range of
- 3000 masl+range
  - 2500 – 3500 masl
  - 1500 – 3200 masl
  - 2000 – 2500 masl

**PART II – Short Answer Questions (20 marks)**

**This part has 4 Short Answer Questions. Answer ALL the questions. Each question carries 5 marks.**

1. If it’s hard to predict the week’s weather, how can one project climate change?
2. How will the single use plastic ban in Bhutan contribute to environmental conservation?
3. Why are wetlands important?
4. What is the importance of celebrating every year on 5<sup>th</sup> June as World Environment Day?

**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**

Forest fire can be caused by natural as well as manmade causes. Fire is an integral part of forests and many forests types have evolved and adapted to fire. In Bhutan, every year there are several incidences of forest fires. Similarly, wildfires across the nations are not uncommon but the fire in the Amazon Rainforest in Brazil is a global concern because as much of its history, rainforest has been fire-resistant due to its natural moisture and humidity. Answer the following questions:

1. Mention types of forest fires (5 marks)
2. There is a fire in the Amazon Rainforest of Brazil. Why is the Amazon rainforest so important to life on Earth? (15 marks)
3. Discuss some environmental impact of forest fire? (30 Marks)

**CASE II**

The quality of the environment, both natural and man-made, is essential to tourism. However, the relationship of tourism with the environment is complex. It involves many activities that can have adverse environmental effects. Many of these impacts are linked with the construction of general infrastructure such as roads and airports, and of tourism facilities, including resorts, hotels, restaurants, shops, etc. The negative impacts of tourism development can gradually destroy environmental resources on which it depends. On the other hand, tourism has the potential to create beneficial effects on the environment by contributing to environmental protection and conservation. Growing environmental concern coupled with an emerging dissatisfaction with mass tourism led to increased demand for ecotourism. Based on this information, answer the following:

1. What is Ecotourism? (5 marks)
2. Discuss some characteristics of Ecotourism. (15 marks)
3. Discuss the relationship of tourism to Climate Change. (10 marks)
4. Discuss some of the benefits and adverse impacts of tourism in Bhutan. (20 marks)

**TASHI DELEK**