

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

PAPER III: SUBJECT SPECIALISATION PAPER FOR ENVIRONMENTAL SCIENCE

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

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 must hand over the Answer Booklet to the Invigilator before leaving the examination hall.**
10. This paper has **6 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. The “Our Common Future” report was also known as which of the following?
 - a) The Sustainability Report
 - b) Stockholm Report
 - c) The Brundtland Report
 - d) None of the above
2. What is the basic idea behind sustainability?
 - a) That we live in a world of limited resources.
 - b) That we want to keep the world as it is.
 - c) That we want to get maximum out of Earth’s resources.
 - d) All of the above.
3. Which of the following is not a Sustainable Development Goal?
 - a) Clean Water and Sanitation
 - b) Reducing Inequality
 - c) Stopping Species Extinction
 - d) Affordable and Clean Energy
4. In a circular economy, how are products ideally designed?
 - a) With the whole product life cycle in mind.
 - b) With the amount that can be sold in mind.
 - c) With the benefits of the products for the user in mind.
 - d) All of the above.
5. Biodiversity
 - a) increases towards the equator.
 - b) decreases towards the equator.
 - c) remains same throughout the planet.
 - d) has no effect on change of latitude.
6. What is Greenwashing?
 - a) The practice of falsely promoting an organization’s environmental efforts.
 - b) Spending more resources to promote the organization as green than are spent on production of the actual product.
 - c) The dissemination of all information regarding an organization’s environmental strategies, goals, motivation, and actions.
 - d) None of the above.
7. Which of the following has positive radiative forcing or warming effect in the global climate?
 - a) Tropospheric Ozone
 - b) Hydrochlorofluorocarbons (HCFCs)
 - c) Sulphur hexafluoride (SF₆)
 - d) Halons

8. Which of the following is an example of ex-situ conservation?
- a) Biological corridors
 - b) Wildlife Sanctuary
 - c) National Park
 - d) Seed bank
9. The National Environment Commission was established in which of the following year?
- a) 1989
 - b) 1990
 - c) 1991
 - d) 1992
10. Water pollution can be identified by testing its
- a) PH level
 - b) Biological Oxygen Demand (BOD)
 - c) Both (a) and (b)
 - d) None of the above
11. Legumes are used for obtaining
- a) Carbohydrates
 - b) Oils
 - c) Protein
 - d) Fibers
12. Greenhouse gases are
- a) absorbers of long-wave radiations from earth.
 - b) transparent to both solar radiation and long-wave radiations from earth.
 - c) absorbers of solar radiations for warming the atmosphere of earth.
 - d) transparent to emissions from earth for passage into outer space.
13. Which of the following is not a source of fresh water?
- a) Glacial and ice sheets
 - b) Groundwater
 - c) Surface runoffs
 - d) Oceans
14. What form of energy is radiated by the earth and trapped by greenhouse gases to cause global warming?
- a) Radio wave
 - b) Infrared light
 - c) Ultraviolet light
 - d) Visible light
15. Which of the following are major environmental issues involved in mining?
- a) Air pollution
 - b) Water pollution
 - c) Noise pollution
 - d) All of the above

16. Which of the following is not available in fertilizer?
- a) Nitrogen
 - b) Phosphorus
 - c) Iron
 - d) Potassium
17. What is the percentage of Biological Corridor in Bhutan?
- a) 9
 - b) 10
 - c) 11
 - d) 12
18. Which is the building block of both animals and plant tissues?
- a) Sulfur
 - b) Carbon
 - c) Nitrogen
 - d) None of the above
19. Which of the following methods is used to estimate flood discharge based on high water mark left over the past?
- a) Slope-area method
 - b) Area-velocity method
 - c) Moving boat method
 - d) Ultrasonic method
20. The species of a cat that lives and hunts in groups is
- a) Leopard
 - b) Lion
 - c) Jaguar
 - d) Cougar
21. At room temperature, most elements are in which phase of matter?
- a) Solid
 - b) Liquid
 - c) Gas
 - d) Plasma
22. The word atom is from a Greek word meaning
- a) Small
 - b) Indivisible
 - c) Unseen
 - d) Visible
23. Ozone in the upper atmosphere is produced from
- a) Lightning
 - b) Electrical appliances on earth
 - c) Photochemical reactions
 - d) Model fractals

24. Pollination by wind is called
- Autogamy
 - Anemophily
 - Entomophily
 - Ornithophily
25. Which of the following is not a major pollutant from automobiles?
- Carbon monoxide
 - Unburned hydrocarbons
 - Nitrous oxide
 - Sulphur dioxide
26. The first animal launched into orbit was a
- Mouse
 - Monkey
 - Rabbit
 - Dog
27. Which of the two gases are used to disinfect water in sewage treatment facilities?
- Helium and nitrogen
 - Ozone and chlorine
 - Oxygen and hydrogen
 - None of the above
28. In a day light the human eye is most sensitive to which colour?
- Green
 - Red
 - Blue
 - Black
29. Compared to terrestrial environment, aquatic environments are more stable in
- temperature range.
 - producer consumer distribution.
 - sunlight absorbed.
 - number of species.
30. What is Cartagena Protocol?
- It deals with access to genetic resources and the fair and equitable sharing of benefits arising from their utilization.
 - It is an international agreement which aims to ensure the safe handling, transport and use of living modified organisms resulting from modern biotechnology that may have adverse effect on biological diversity, taking into account risks to human health.
 - It is an agreement among countries to take steps for reducing Ozone Depleting Substance.
 - None of the above.

PART II – Short Answer Questions [20 marks]

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

1. What is a Nature-based Solution? (5 Marks)
2. What is a Corporate Social Responsibility? (5 Marks)
3. What is a seed bank? (5 Marks)
4. What is Cumulative Impact Assessment? (5 Marks)

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

In Bhutan there are few tools deployed to ensure that environmental concerns are taken into account while formulating, renewing, or modifying of a project. This is also further strengthened by the Environmental Assessment Act 2000 and the Regulation for the Environmental Clearance of Projects 2016. Development activities in Bhutan are subjected to the Environmental Assessment Process to ensure that they are socially acceptable, environmentally sound and economically feasible.

1. What is an Environmental Impact Assessment? (5 Marks)
2. What is an Environmental Management Plan? (5 Marks)
3. What is the difference between Environmental Impact Assessment and Strategic Environmental Assessment? (10 Marks)
4. Why is Public Consultation important in the Environmental Impact Assessment Process? (10 Marks)
5. List both positive and negative environmental impacts associated with mining in Bhutan and explain each one of them? (20 Marks)

CASE II

Invasive Alien species (IAS) is considered to be one of the major drivers of biodiversity loss, thereby altering the ecosystem services and socio-economic conditions. Biodiversity is inextricably linked with the ecosystem services and human welfare. Globally, biodiversity is known to produce food and ensure nutritional security, provide herbal medicine and many other benefits. However, for the past several decades, the IAS have posed severe threats to the local biodiversity, ecosystem services, environmental quality and human health.

1. What is Invasive Alien Species? (5 Marks)
2. List some of the negative impacts of Invasive Aline Species and describe each one of them? (20 marks)
3. List some of the invasive species – both plants and animals - found in Bhutan. (10 Marks)
4. Describe some methods to control invasive alien species. (15 Marks)

TASHI DELEK