

**ROYAL CIVIL SERVICE COMMISSION
BHUTAN CIVIL SERVICE EXAMINATION (BCSE) 2016
EXAMINATION CATEGORY: TECHNICAL**

PAPER III: SUBJECT SPECIALIZATION PAPER FOR ENVIRONMENTAL SCIENCE

Date: 2 October 2016
Total Marks: 100
Examination Time: 150 minutes (2.5 hours)
Reading Time: 15 minutes (*prior to examination time*)

GENERAL INSTRUCTIONS

1. Write your Registration Number clearly and correctly on the Answer Booklet.
2. The first 15 minutes is being provided to check the number of pages, printing error, clarify doubts and to read instructions in Question Paper. You are NOT permitted to write during this time.
3. This paper consists of **TWO Sections, namely Section A and 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 2 case studies. Choose only **ONE** case study and answer the questions under 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 correct Section, Part and Question Number will NOT be evaluated and no marks would 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. The Question 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 (c). Each question carries ONE mark. Any double writing, smudgy answers or writing more than one choice shall not be evaluated.

1. Which of the following is not an air pollutant?
 - a. Smoke
 - b. Carbon Dioxide
 - c. Nitrogen Gas
 - d. Sulphur Dioxide

2. Which part of the plant evaporates water?
 - a. Stomata
 - b. Fruit
 - c. Branch
 - d. Root

3. Which energy is converted into electrical energy by a solar cell?
 - a. Chemical Energy
 - b. Nuclear Energy
 - c. Solar Energy
 - d. Magnetic Energy

4. In which state of matter, the distance between the molecules is minimum?
 - a. Solid
 - b. Liquid
 - c. Gas
 - d. Plasma

5. Tobacco addiction is caused due to
 - a. Cocaine
 - b. Caffeine
 - c. Nicotine
 - d. Histamine

6. Ozone layer is found in
 - a. Thermosphere
 - b. Stratosphere
 - c. Troposphere
 - d. Mesosphere

7. Sugar is form of
 - a. Protein
 - b. Carbohydrate
 - c. Fat
 - d. Water

8. The mosquito repellent (coils, mats and liquids) that we generally use in our homes are:
 - a. Pesticides
 - b. Fertilizers
 - c. Sedatives
 - d. Insecticides

9. Which of the following plays an important role in the cause of rainfall?
 - a. Evaporation
 - b. Condensation
 - c. Both Evaporation and Condensation
 - d. Filtration

10. When we exhale, our lungs have to
 - a. Contract
 - b. Expand
 - c. Be still
 - d. None of the above

11. Which of the following is a biodegradable waste?
 - a. Plastics
 - b. Polythene
 - c. Glass
 - d. None of the above

12. Paper is mainly made up of
 - a. Cellulose and starch
 - b. Polythene and cotton
 - c. Bamboo and grass
 - d. Sunflower and maize

13. Non-green plants like mushroom cannot make their own food because
 - a. They are too small
 - b. They lack chlorophyll
 - c. They lack photo-tropism
 - d. They lack roots to suck water

14. When cool air flows from a high mountain region to a region of lower elevation, the air will
 - a. Increase in moisture content
 - b. Condense, forming large amounts of dew
 - c. Undergo adiabatic warming
 - d. Undergo adiabatic cooling

15. Animals in which of the following groups may have a backbone and a spinal cord?
 - a. Mollusks
 - b. Chordates
 - c. Invertebrates
 - d. Echinoderms

16. The Royal Government of Bhutan ratified the Nagoya Protocol under the Convention on Biological Diversity in
 - a. January 2013
 - b. January 2014
 - c. September 2013
 - d. August 2013

17. A high Biological Oxygen Demand (BOD) indicates that
 - a. Water is pure
 - b. Absence of microbial action
 - c. Low level of microbial pollution
 - d. High level of microbial pollution

18. The pollution which does not cause persistent harm to life supporting system is
 - a. Noise pollution
 - b. Radiation pollution
 - c. Organochlorine pollution
 - d. All of the above

19. Environmental Impact Assessment (EIA) was formally established in Bhutan
 - a. 1989
 - b. 1992
 - c. 1995
 - d. 2000

20. Group of individuals of the same species that share common attributes are called
 - a. Community
 - b. Population
 - c. Ecotype
 - d. Society

21. What will be the outcome of Eutrophication of surface wastewaters?
 - a. Overproduction of biomass
 - b. Decrease in nitrogen concentration
 - c. Decrease in phosphorus concentration
 - d. Decrease in both nitrogen and phosphorus concentrations

22. Bacterial decomposition of biological materials under aerobic condition is
 - a. Fermentation
 - b. Fertilizer
 - c. Contamination
 - d. Composting

23. When you go for shopping, what are you expected to do to save the environment?
 - a. Shop for products that have a little packaging as possible.
 - b. In any shop, use a bag even it is not needed.
 - c. Do not reduce the frequency of shopping.
 - d. Buy paper towels and napkins.

24. Climatic stress is caused by insufficient and/or excessive regime of
- Temperature
 - Humidity
 - Solar radiation
 - All of the above
25. The chemical that is used to ripen mangoes is
- Calcium sulphide
 - Calcium carbide
 - Calcium carbonate
 - Calcium chloride
26. Which one of the following does not contribute to conservation of water?
- Waste water treatment
 - Waste land development
 - Watershed protection
 - Rain water harvesting
27. Which of the following is not a renewable energy source?
- Wind
 - Solar
 - Biomass
 - Natural gas
28. The term "exothermic" refers to a chemical reaction
- in which heat is absorbed.
 - in which heat is given out.
 - that proceeds very rapidly.
 - that requires high temperature to begin the reaction.
29. Mercury is particularly hazardous to human health because
- it bioaccumulates high up in the food chain.
 - as a heavy metal, it can cause serious impact injury.
 - it is light and volatile, and so is widely dispersed through the environment by wind.
 - as a pure metal, it is very soluble in water, hence easily absorbed through drinking water.
30. A scientist states that the sewerage outlet project must be ecologically sustainable. This means that the project must
- meet the needs of the current population without compromising the needs of the future generations.
 - not affect the ecology of the nearby water bodies in any way.
 - take into account the particular ecology of the nearby water bodies.
 - maintain the biodiversity of the nearby water bodies.

PART II – Short Answer Questions (20 marks).

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

1. Name four segments of environment and explain them in brief (5 marks)
2. What is endangered species? (5 marks)
3. What are the causes of soil pollution? (5 marks)
4. What is payment for environmental services? (5 marks)

SECTION B

Case Study

Choose either Case 1 or 2 from this section. Each case study carries 50 marks.

Case 1

Bhutan has the Constitutional mandate to maintain 60% of the forest cover at all times to come and currently has 51.40% of the total land area under Protected Area networks. Based on this, answer the following questions:

- a) What are the different types of Protected Areas networks in the country? (10 marks)
- b) What are some of the benefits for maintaining Protected Areas in the country (10 marks)
- c) Would you support maintaining Protected Areas in the Country? Yes or No. Substantiate your answer (30 marks).

OR

Case 2

Wastes in Bhutan has become one of the emerging environmental issues. Wherever we go, near the water bodies, forests, villages or towns, one can find all kinds of wastes. There are several institutions involved in the management of wastes in the country. To help curb the wastes issues, the Royal Government of Bhutan enacted the Waste Prevention and Management Act in 2009. Based on this scenario, answer the following questions:

- a) What is Waste? (5 marks)
- b) Name different categories of wastes found in Bhutan? (5 marks)
- c) What are negative impacts of wastes on the environment? (20 marks)
- d) How can you help reduce waste in the country? (20 marks)

TASHI DELEK