

**ROYAL CIVIL SERVICE COMMISSION
TECHNICAL GRADUATES SELECTION EXAMINATION: 2009**

PAPER II: GENERAL SUBJECT KNOWLEDGE FOR BIO SCIENCE GROUP

Date : 7th November 2009
Time allowed : 90 minutes
Question Reading Time: 15 minutes (in addition to the 90 minutes)
Total Marks : 100

Please read the following instructions carefully!

1. General instructions:

- 1.1 Under the provision of the Technical Graduates Selection Examination procedures of the Royal Civil Commission, candidates shall write their **Roll No.** only on the answer book provided. All question should be answered in the answer book which will be provided.
- 1.2 No other particulars that would indicate the identity of a candidate shall be written on the answer book. Any candidate found guilty of writing their particulars or making any identifications marks in the answer book shall be disqualified from consideration of future employment by the RCSC.
- 1.3 This book is the property of the RCSC and shall not be removed from the examination hall. It consists of 14 pages including this page. Any pages found missing should be reported to the invigilators within the first 15 minutes of receipt of the question book.
- 1.4 Candidates shall not be allowed to carry any papers inside the examination hall.
- 1.5 Candidates shall be required to produce the Admission Card while entering the examination hall and when demanded by the concerned authorities.

2. Specific instructions:

- 2.1 Do not write anything during the first 15 minutes, which does not include the 90 minutes for answering. This time is to be spent in reading the instructions, the questions and to make sure that no pages are missing.
- 2.2 Any misprint/clarification in the questions must be raised during the first 15 minutes.
- 2.3 Once the examination begins, you will not be allowed to ask questions or leave the examination hall.
- 2.4 There are 70 multiple choice questions of one mark each and 10 short answers questions of 3 marks each. All questions are compulsory.

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Time allotted: 90 minutes; Total Marks: 100

PART A : Multiple choice questions of one mark each (total marks:70)

Special Instruction: Copy the Question Number on your answer sheet and write the correct answer as a, b, c, or d.

1. Which of the following is NOT a type of soil?
 - a. Sand
 - b. Ash
 - c. Clay
 - d. Loam

2. Which one of the following is NOT included in Earth's climate system?
 - a. Hydrosphere
 - b. Biosphere
 - c. Solarsphere
 - d. Atmosphere

3. Of the following, which has the greatest permeability?
 - a. Clay
 - b. Loam
 - c. Sand
 - d. Silt

4. Which one of the following is NOT a greenhouse gas?
 - a. Carbon dioxide
 - b. Methane
 - c. Oxygen
 - d. All are green house gases.

5. The presence of which of the following contaminants would be the strongest reason for judging municipal sewage sludge unfit for use as fertilizer?
- Human faeces
 - Ammonia
 - Phosphates
 - Heavy metals
6. Which of the following greenhouse gases has the greatest heat-trapping ability per molecule?
- Carbon dioxide
 - Carbon monoxide
 - Chlorofluorocarbon
 - Methane
7. Legume crop in a well fertilized field will provide the following two results in soil:
- Improved drainage and porosity
 - Nitrogen fixation and better crop
 - No nitrogen fixation and no nodulation
 - Nitrogen fixation and no nodulation
8. The fermentation of glucose by yeast normally yields
- Lactic acid, CO₂, and 2 ATP
 - Alcohol, CO₂, and 36 ATP
 - Alcohol, CO₂, and 2 ATP
 - CO₂, H₂O, and 36 ATP
9. The largest consumer of fossil fuels and the largest producer of greenhouse gases is:
- Canada
 - United States
 - China
 - Germany
10. The Brown Swiss bull used for cross breeding in Bhutan is an exotic breed from
- Japan
 - Australia
 - Switzerland
 - Holland

11. The science of growing vegetable is called

- a. Agriculture
- b. Olericulture
- c. Apiculture
- d. Floriculture

12. Nodules with nitrogen fixing bacteria are present in

- a. Pea
- b. Wheat
- c. Maize
- d. Apple

13. Which of the following is possible consequence of a greenhouse warming?

- a. new weather patterns
- b. a rise in sea level
- c. a change in agriculture productivity
- d. all of the above

14. Which of the following is not a sustainable agriculture technique?

- a. Mixed farming
- b. Slash and burn farming
- c. Conservation agriculture
- d. Organic farming

15. Which of the following is not a step of plant breeding?

- a. Introduction
- b. Cultivation
- c. Selection
- d. Hybridization

16. Which one of the following is a significant contributor to increased level of atmospheric carbon dioxide?

- a. Aerosol sprays
- b. Deforestation
- c. Refrigerant leakage
- d. None of the above

17. Which water treatment best reduces the risk of infection by killing pathogen in drinking water?

- a. Chlorination
- b. Filtration
- c. Fluoridation
- d. Precipitation

18. Lung cancer is one of the diseases linked to smoking. To what category of disease does lung cancer belong?

- a. Environmental
- b. Infectious
- c. Nutritional
- d. Viral

19. Imagine a farm as a system. Which of the following would not be an INPUT?

- a. Ploughing
- b. Machineries
- c. Climate
- d. Fertilizer

20. This type of farm involves a high level of input to achieve a high yield per hectare.

- a. Extension farming
- b. Commercial farming
- c. Subsistence farming
- d. Intensive farming

21. Which of the following best describes subsistence farming?

- a. Farming on large scale for profit
- b. Farming providing just enough for farmer's own family
- c. Farming involving large amount of inputs (e.g. fertilizer)
- d. Farming involving few people and large amount of land

22. What is the Kyoto Protocol ?

- a. VVIP protocol extended to the heads of the country.
- b. Treaty to reduce green house gases to 5% below 1990 level by 2010
- c. A trade protocol between China and USA
- d. A standard research protocol generally followed by space research agencies.

23. Which of the following is NOT a reason for farmers to begin diversification?

- a. Availability of sufficient irrigation water
- b. Traditional farming is still profitable
- c. Traditional farming is no longer profitable
- d. Market demand for new high value crops and meat.

24. Which one of the following does not cause soil erosion?

- a. Monoculture and the use of fertilizer
- b. Contour ploughing
- c. Removal of hedgerows
- d. Overgrazing by animals

25. Which formula represents an organic compound?

- a. $Mg(OH)_2$
- b. $NaCl$
- c. $C_{12}H_{22}O_{11}$
- d. NH_3

26. Many unicellular organisms reproduce by the process of

- a. fission
- b. regeneration
- c. ovulation
- d. non disjunction

27. Which one of the following is an example of non-renewal resources?

- a. Wind
- b. Water
- c. Vegetation
- d. Coal and Minerals

28. Both power and manure are provided by..... .

- a. Thermal Plant
- b. Nuclear plants
- c. Biogas plants
- d. Hydroelectric plants

29. A biosphere reserve conserve and preserve.....
- a. Wild animals
 - b. Wild land
 - c. Natural Vegetation
 - d. All the above
30. The death of the last individual of a species is called.....
- a. Extinction
 - b. Clad
 - c. Neither a or b.
 - d. Species diversity.
31. Biogas generation is mainly based on the principle of
- a. Fermentation
 - b. Degradation
 - c. Putrification
 - d. Both a & b
- 32..... of stratosphere provides protection to our life.
- a. Nitrogen
 - b. Hydrogen
 - c. Ozone
 - d. Argon
33. The main cause of mismanagement of natural resources is because of
- a. A large increase in population
 - b. The conservation of land for food crops
 - c. A Great demand for petroleum
 - d. Reduction in crop yield
34. The world trade organization was formed in the yearwith GATT as it basis.
- a. 1993
 - b. 1994
 - c. 1995
 - d. 1996

35. Soil erosion by wind brings about the serious damage in soil by changing the.....

- a. Soil permeability
- b. Soil structure
- c. Soil texture
- d. Soil plasticity

36. Which of the following types of RNA takes a message from DNA in the nucleus to the ribosomes in the cytoplasm?

- a. m-RNR
- b. r-RNA
- c. t-RNA
- d. All of the above

37. The combustion of coal and oil is a major source of which greenhouse gas?

- a. Ozone
- b. Methane
- c. CFCs
- d. None of the above

38. The transfer of minerals from top soil to subsoil through soil-water is called..

- a. Percolation
- b. Conduction
- c. Leaching
- d. Transpiration

39. The smallest unit of genetic material capable of undergoing mutation is....

- a. Cistron
- b. Muton
- c. Recon
- d. Proton

40. Which part of brain allows one side of brain to control opposite side of body ?

- a. Mid Brain
- b. Medulla
- c. Cerebellum
- d. Pons

41. Which of the following is basic amino acid?

- a. Alanine
- b. Aspartic acid
- c. Asparagine
- d. Arginine

42. Community health services involves.....

- a. Control of communicable diseases
- b. School health education
- c. Awareness of clean environment
- d. All the above

43. What percentage of Bhutan's land area is under agriculture?

- a. 12.8%
- b. 7.8%
- c. 25.0%
- d. 9 %

44. A starving person consumes first.....

- a. Body fats
- b. Body proteins
- c. Vitamins
- d. Stored glycogen

45. Which of the following is common disease of potato in Bhutan?

- a. Tuber rot
- b. Nematodes
- c. Blight
- d. Powdery mildew

46. Milk tastes sour when kept in the open for sometime due to formation of.....

- a. carbonic acid
- b. lactic acid
- c. Citric acid
- d. Malic acid

47. The 'soft spot' on the top of an infant's skull is called.....

- a. Suture
- b. Fontanelle
- c. Ligament
- d. Fascia

48. When was the agreement on establishing SAARC Food Bank signed?

- a. 1990
- b. 2001
- c. 2007
- d. 2008

49. What is the total land area of Bhutan?

- a. 47045 square kilometers
- b. 37500 square kilometers
- c. 38,394 square kilometers
- d. 40569 square kilometers

50. Which of the following condition in the Himalayan watershed contribute(s) to flooding in Bangladesh?

- a. Rapid population growth
- b. Deforestation
- c. Unsustainable farming practices
- d. All of the above

51. A body of water can be depleted of its oxygen by

- a. Inorganic plant nutrients
- b. Organic waste
- c. Organic compounds such as oil, plastics, and solvents
- d. A and B

52. What percentage of Bhutanese population is living under poverty line (Nu. 1096.94 per month)?

- a. 32.5%
- b. 35%
- c. 23.2%
- d. 28.6%

53. A Gene

- a. Is a segment of DNA located on chromosome
- b. Determines an organism's traits
- c. Typically contains one allele from each parent
- d. All of the above

54. Headquarters of the International Cooperatives Alliance(ICA) is at

- a. New York
- b. London
- c. Geneva
- d. Tokyo

55. When fertilization occurs, offspring inherit

- a. A complete set of chromosomes from one of the parents
- b. One homologous chromosome in a pair from each parent
- c. Two homologous chromosomes in pairs from each parent.
- d. A random amount of chromosomes from each parent.

56. Organic Agriculture makes use of

- a. Organic matter as one of the main plant nutrient sources
- b. Organophosphates as one of the main plant nutrient sources
- c. Organochlorines as one of the main plant nutrient sources
- d. Organic synthetics as one of the main plant nutrient sources

57. Cooperatives (Amendment) Act of Bhutan 2009 was first time enacted in which year?

- a. 2001
- b. 2002
- c. 2003
- d. 2004

58. Along with carbon dioxide, is largely responsible for the greenhouse effect of the atmosphere.

- a. hydrogen
- b. water vapor
- c. oxygen
- d. nitrogen

59. Major nutrients required by crops are

- a. Nitrogen, Zinc and Calcium
- b. Phosphorus, Boron and calcium
- c. Nitrogen, Phosphorus and Potassium
- d. Potassium, boron and Nitrogen

60. Which statement best define the parasitism?

- a. Both species benefit
- b. Both species are harmed
- c. Only one species benefits
- d. None of the above.

61. Who propounded the theory of Natural Selection?

- a. Darwin
- b. Lamarck
- c. Linnaeus
- d. Wallace

62. Who discovered antibiotic- penicillin?

- a. Ladonna
- b. Palila
- c. Alexander Fleming
- d. Lamarck

63. Maintaining biological diversity in the natural habitats or reserves is an example of

- a. Nature conservation
- b. In situ conservation
- c. Wild life conservation
- d. Ex situ conservation

64. When did recent total solar eclipse occur?

- a. June 20, 2009
- b. July 22, 2009
- c. April 25, 2009
- d. December 25, 2008

65. What is the scientific name of the Black necked crane?

- a. *Grus nigricollis*
- b. *Gallus gallus*
- c. *Aquila Chrysaetos*
- d. *Leptotila wellsi*

66. Which is the national bird of Bhutan?

- a. *Corvus corax*
- b. *Pavo Cristatus*
- c. *Copsychus saularis*
- d. *Gallus lafayetti*

67. H1N1 commonly known as swine flu is caused by

- a. Type A influenza virus
- b. IPT virus
- c. H5N1 virus
- d. Type HN influenza virus.

68. Four *Landgos* (Bhutanese unit of land measurement) of dry land is equal to

- a. 1 hectare
- b. 2.5 hectare
- c. 1 acre
- d. 0.5 acre

69. The important crop in Bhutan with scientific name *Pyrus malus* is commonly known as

- a. Coffee
- b. Apple
- c. Banana
- d. Sorghum

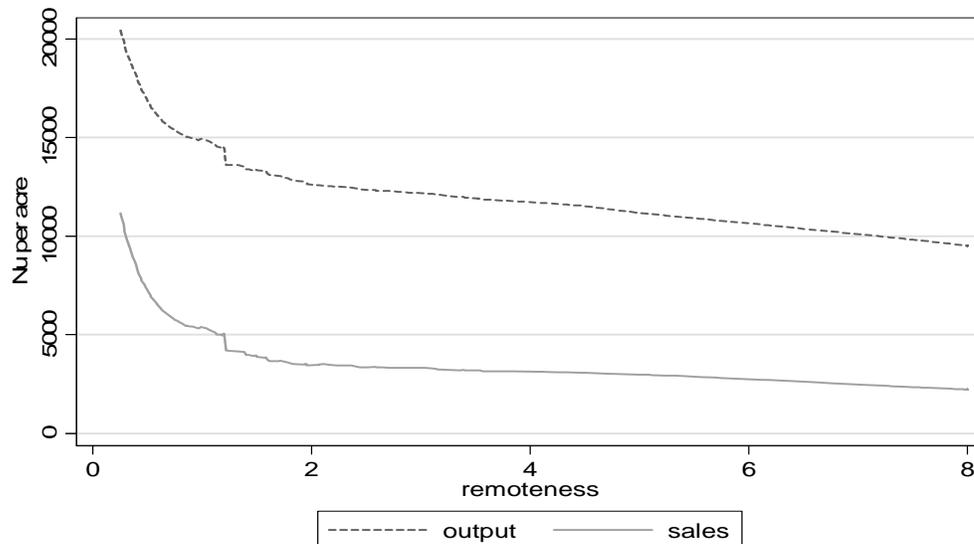
70. Jigme Singye Wangchuk National Park, one of the protected areas in Bhutan does not include this Dzongkhag

- a. Trongsa
- b. Sarpang
- c. Zhemgang
- d. Samtse

PART B: Ten short answer questions of 3 marks each (Total 30 marks). Answer all the 10 questions. Write your answers in the answer book provided.

1. What is photosynthesis? Name the product and by-product of Photosynthesis.
2. “Take nothing except memories; leave nothing except your foot print”. This quotation is generally seen around parks and national reserves/protected forest. Evaluate the quotation and state your opinion keeping in mind the need for bio-diversity conservation.
3. Look at the figure 1 below and discuss it.

Figure 1. Value of output and sales (Nu/acre) by remoteness (hours to main road)



4. Define farming Systems.
5. Briefly discuss IT and its usefulness for rural development.

Write brief note on the followings.

6. Livestock farming and poverty alleviation
7. Climate change and its impact to Bhutan
8. H1N1, its transmission and prevention
9. Eco-tourism and its impact on rural population.
10. Earthquake

GOOD LUCK