

ROYAL CIVIL SERVICE COMMISSION
BHUTAN CIVIL SERVICE EXAMINATION (BCSE) 2022
EXAMINATION CATEGORY: TECHNICAL

PAPER II: GENERAL SUBJECT KNOWLEDGE PAPER FOR MEDICAL SCIENCE

Date	: October 8, 2022
Total Marks	: 100
Writing Time	: 90 minutes (1.5 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 Parts: Part I & Part II**
Part I consists of 70 multiple choice questions of 1 (one) mark each, and
Part II consists of 10 short answer questions of 3 (three) marks each.
4. All questions are COMPULSORY.
5. 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.
6. 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 any or correct Section, Part and Question Number will NOT be evaluated and no marks would be awarded.
7. Begin each Part in a fresh page of the Answer Booklet.
8. You are not permitted to tear off any sheet(s) of the Answer Booklet as well as the Question Paper.
9. Use of any other paper including paper for rough work is not permitted.
10. **You must hand over the Answer Booklet/s to the Invigilator before leaving the examination hall.**
11. This paper has **13 printed pages**, including this instruction page.

GOOD LUCK!

Part I

Multiple Choice Questions [70 marks]

Choose the correct answer and write down the letter of your chosen answer in the Answer Booklet against the question number e.g. 71 (a). Each question carries ONE mark. Any double writing, smudgy answers or writing more than one choice shall not be evaluated.

1. Apple belongs to a group of fruits called
 - a) Drupes
 - b) Pomes
 - c) Berries
 - d) Nuts

2. Choose the **CORRECT** basic needs of the human being.
 - a) Food-Water-Shelter-Education
 - b) Water-shelter-education-cars
 - c) Shelter-food-education-Cars
 - d) Cars-food-shelter-water

3. Which of the following organism breathe through skin?
 - a) Snake
 - b) Lizard
 - c) Squirrel
 - d) Earthworm

4. All of the following are important in Photosynthesis **EXCEPT**
 - a) Carbon dioxide
 - b) Water
 - c) Plastid
 - d) Oxygen

5. Cell wall of a plant is composed of
 - a) Cellulose
 - b) Carbohydrates
 - c) Lipoprotein
 - d) Fats

6. All of the following are functions of Henles loop in the human kidney **EXCEPT**
 - a) Transport of ions and water
 - b) Concentration of urine
 - c) Water and nutrient reabsorption
 - d) Dilution of the urine

7. Which substance is in higher concentration in blood than in glomerular filtrate?
 - a) Urea
 - b) Plasma Protein
 - c) Glucose
 - d) Water

8. The most accepted theory of origin of life is
- special creation theory.
 - Theory of spontaneous generation.
 - Oparin Haldane Theory.
 - Theory of abiogenesis.
9. Most vitamins are
- Co-enzymes
 - Catalyst
 - Competitive inhibitors
 - Feedback inhibitors
10. Action potential is due to the movement of
- NA⁺
 - K⁺
 - Cl⁻
 - Ca⁺
11. All the following cause water absorption into the plant **EXCEPT**
- High Turgor Pressure of a plant cell
 - Transpiration pull force
 - Osmotic pressure of the soil water
 - Non osmotic pressure of the root hairs
12. All the following are insoluble in water **EXCEPT**
- Vitamin A
 - Vitamin D
 - Vitamin C
 - Vitamin E
13. Choose the trace elements which is required for teeth formation.
- Manganese
 - Copper
 - Calcium
 - Magnesium
14. Health Bulletin of the Ministry of Health 2021 shows highest death due to alcohol. Choose the best advice for the public to advocate on alcohol effect.
- Everyone should stop drinking immediately
 - Ignore the people seeing drinking in social gatherings and parties.
 - Avoid excessive drink and adopt of habit of daily exercise.
 - Stay at home without going anywhere
15. Choose the function of parasympathetic nervous system.
- Constriction of pupils
 - Acceleration of heart beat
 - Stimulating of sweat gland
 - Contraction of hair muscles

16. Which of the following is not lymphoid tissue?
- Thymus
 - Lymph node
 - Bone marrow
 - Liver
17. Choose the good cholesterol from the following.
- Chylomicron
 - Very low density lipoprotein
 - Low density Lipoprotein
 - High density Lipoprotein
18. Appearance of Nairobi Fly probably indicates
- Climatic Change
 - Environmental disturbance
 - Increase population
 - Onset of monsoon
19. Infection induced by physician to the patient is known as
- Iatrogenic
 - Nosocomial
 - Congenital
 - Subclinical
20. The myofilaments of muscles consist primarily of two proteins. These two proteins are called
- Actin and myosin
 - Progesterone and testosterone
 - Progesterone and estrogen
 - Actin and pectin
21. All of the following are the impact of intensive farming called Green Revolution **EXCEPT**
- Water scarcity
 - Loss of habitat
 - Increase in soil fertility
 - Loss of genetic diversity
22. Increase in blood pressure and heart rate is caused by
- Adrenaline
 - Thyroid
 - Secretin
 - Gastrin
23. What causes people taking excess alcohol to vomit?
- Stimulated by excess acetyl aldehyde
 - Due to entry of alcohol into the brain
 - Alcohol is converted to toxic substances in the liver
 - Lack of tolerance of stomach wall for the excess alcohol

24. Choose the most favourable activities for asthmatic patients **EXCEPT**
- Climbing mountains
 - Taking bath with cold water
 - Working in the industries and factories
 - Avoiding crowds and dusty places
25. Sex of the child depends upon the kind of the sperm that fertilizes the egg. All eggs contain
- only X chromosome.
 - only Y chromosome.
 - only XY chromosome.
 - only XX chromosome.
26. The number of major sense organs in the body is _____.
- five
 - two
 - three
 - four
27. Gout is due to accumulation of uric acid around the joints produced by
- breakdown of purines.
 - breakdown of fats.
 - breakdown of carbohydrates.
 - breakdown of proteins.
28. When our eyes shift the vision from a nearby object to a distant object, it accommodates by
- flattening the lens.
 - thickening the lens.
 - rotating the lens.
 - curving the lens.
29. Which of the following are the hormones produced by the pancreas?
- Insulin and thyroxin.
 - Somatostatin and calcitonin
 - Adrenalin and glucagon.
 - Insulin, glucagon and somatstatin
30. Anaerobic respiration in animals produces _____.
- lactic acid
 - ethanol
 - glucose
 - carbon dioxide
31. The ear ossicles of a mammal are arranged in which one of the following orders from superficial to deep?
- Malleus, incus, stapes
 - Malleus, stapes, incus
 - Incus, malleus, stapes
 - Stapes, incus, malleus

32. The pepsin is example of enzymes produce by
- chief cells in stomach.
 - parietal cells in stomach.
 - kidney cells.
 - Kupffer cells in the liver
33. Bilirubin is found in _____.
- Saliva
 - Bile
 - Blood
 - Pancreatic juice
34. Which of the following are the least important for body energy?
- Protein
 - ATP
 - Lipid
 - Carbohydrates
35. Blood group of a person that contains two antigens in their blood cells is _____.
- AB-
 - O+
 - AB+
 - A+
36. The T3 & T4 hormone plays important in body metabolism. Where in the body are they produced?
- Liver
 - Kidney
 - Spleen
 - Thyroid
37. Which of the following is responsible for connecting bone to bone?
- Tendon
 - Hyaline cartilage
 - Ligament
 - Elastic cartilage
38. The chromosomes responsible for characteristics other than sex are known by the terms _____.
- Ribosomes
 - Lysosomes
 - Autosomes
 - Spermatocytes
39. The heart valve that prevent the back flow of the blood from the lungs is called _____.
- Tricuspid valve
 - Bicuspid valve
 - Mitral valve
 - Pulmonary valve

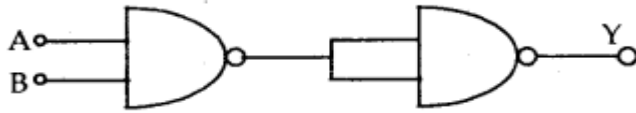
40. Islet of Langerhans is found in
- Pancreas
 - Liver
 - Spleen
 - Ovary
41. Which one of the following is the primary ions involved in gaseous exchange in and out of the lungs?
- H^+ only
 - HCO_3^- only
 - H^+ & HCO_3^-
 - PO_4 only
42. Which one of the following is the most appropriate characteristics of catalyst?
- Doesn't initiate chemical reaction but enhance the reaction.
 - Act as reactant in the chemical reaction.
 - Changed chemical composition after the reaction.
 - Change the final position of chemical equilibrium.
43. Chemicals which liquefy when exposed to air is called _____.
- Desiccator
 - Buffer
 - Hygroscopic substances
 - Anhygroscopic chemical
44. Which of the following helps to keep a reagent or chemical dry?
- Plastic bottles
 - Amber colored bottles
 - Desiccators
 - Test tubes
45. During winter the metallic pipe gets cracked and burst due to:
- High water pressure in winter
 - Contraction of the metallic pipe in winter
 - Expansion of ice in the pipe
 - Pipe becomes brittle during winter
46. Choose the **CORRECT** phenomenon while cooking food at Lunana.
- Food is cooked fast
 - Water boils slowly
 - Food is cooked slowly
 - Vapor pressure is increased
47. The volume of a gas at constant temperature varies inversely with the pressure exerted on it. The above statement is _____.
- Boyle's Law
 - Charles' Law
 - Dalton's Law
 - Faraday's Law

48. Which of the following among alkali metals is most reactive?
- Sodium
 - Potassium
 - Rubidium
 - Caesium
49. The ratio of γ for inert gases is:
- 1.66
 - 99
 - 1.33
 - 2.13
50. Choose the correct statement about an air:
- Air is a compound.
 - Air is a solution.
 - Air is mixture of gaseous elements.
 - Air is an element.
51. The atoms of the elements having same mass number but different atomic number are called:
- Isotopes
 - Isobars
 - Isotones
 - Isomers
52. Choose the element which is essential for construction of nuclear reactors.
- Zirconium
 - Nickel
 - Cobalt
 - Tungsten
53. The chemical compound used as baking powder is:
- CaCO_3
 - N_2CO_3
 - KHCO_3
 - NaHCO_3
54. The most abundant metal on earth crust is:
- Iron
 - Magnesium
 - Calcium
 - Aluminum
55. Which of the following metals is not attacked by the environment?
- Copper
 - Silver
 - Gold
 - Iron

56. The voltage across a conductor is directly proportional to the current flowing through it, provided all physical conditions and temperatures remain constant. It is called:
- Coulomb's law
 - Faraday's law
 - Law of conservation of charge
 - Ohms Law
57. Electric field lines provide information about
- Field strength
 - Nature of charge
 - Direction
 - All the above
58. The unit of an electric charge is:
- Coulomb
 - Watt
 - Electron volt
 - Ampere
59. All the following are properties of concave lens **EXCEPT**
- One surface that curves inwards
 - Position of the image is before the object on the same side
 - Image formed is inverted
 - Image formed is virtual
60. The electromagnetic radiation with longest wavelength is:
- X-rays
 - Ultraviolet rays
 - Radio waves
 - Infra-red rays
61. Hitting a ball gives an example of:
- Newton's First Law
 - Newton's Second Law
 - Newton's Third Law
 - Newton's law of universal gravitation
62. A 4kg mass and a 1kg mass are moving with equal kinetic energies. The ratio of the magnitudes of their linear momenta is
- 1 : 2
 - 1 : 1
 - 4 : 1
 - 2 : 1
63. If a conductor has a potential $V \neq 0$ and there are no charges anywhere else outside, then
- there must be charges on the surface or inside itself.
 - there cannot be any charge in the body of the conductors.
 - there must be charges only on the surface.
 - Both (a) and (b) are correct.

64. In a parallel plate capacitor, the capacity increases if
- area of the plate is decreased.
 - distance between the plates increases.
 - area of the plate is increased.
 - dielectric constantly decreases.

65. The following logic symbol is equivalent to:



- AND gate
 - OR gate
 - NOT gate
 - NAND gate
66. The best example of converting light energy into electrical energy is
- moving dynamo.
 - moving of turbine by water.
 - solar panel.
 - wind mill.
67. What type of pulley is a construction crane?
- Fixed pulley
 - Single Movable pulley
 - Compound pulley
 - Combination of all
68. All the following are the properties of image formed by a convex mirror **EXCEPT**
- It is always formed behind the mirror between the pole and its focus.
 - It is always virtual and erect.
 - Its size is always smaller than the object
 - Magnification is always negative.
69. The strength of the earth's magnetic field is
- constant everywhere.
 - zero everywhere.
 - having very high value.
 - vary from place to place on the earth's surface.
70. Which of the following colours of white light deviated most when passes through a prism?
- Red light
 - Violet light
 - Yellow light
 - All the above

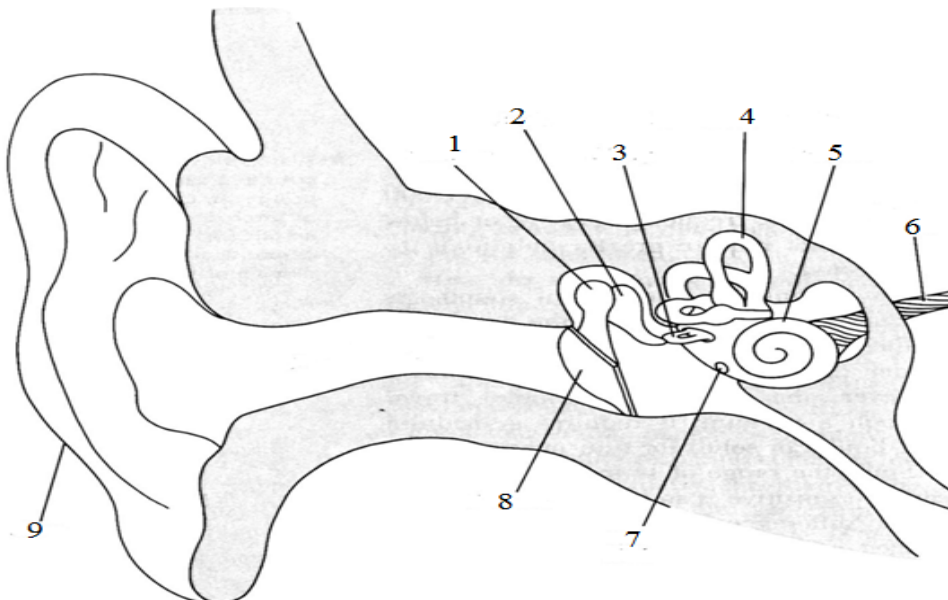
PART II – Short Answer Questions [30 marks]

Answer ALL 10 short answer questions. Each question carries 3 marks.

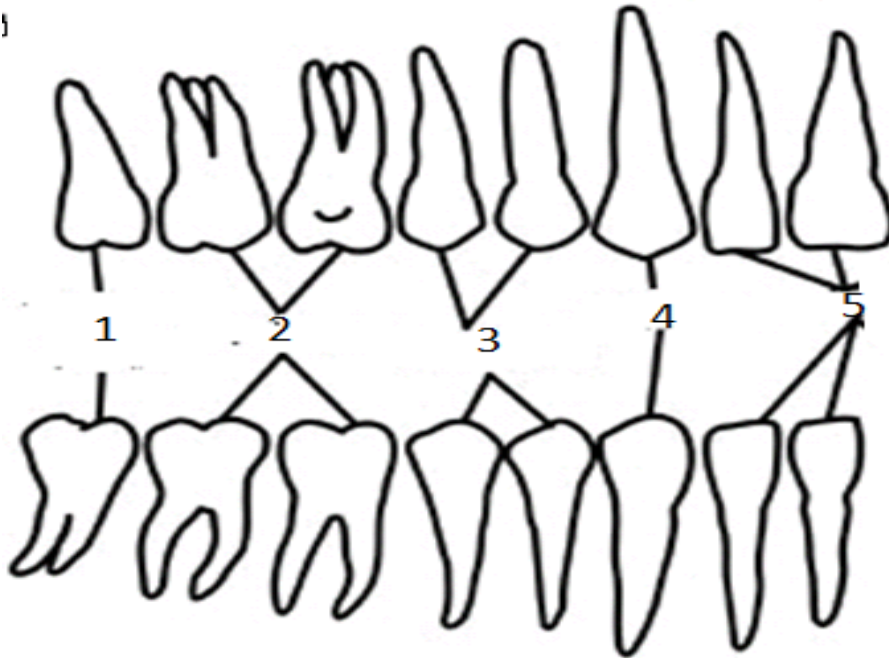
1. The step survey on non-communicable diseases carried out in 2019 reported the following findings which is a serious public health concern for the country:
- The mean population salt intake was found to be 8.3 grams/day as against the WHO recommended level of 5 grams/day.
 - 42.9% of respondents were current drinkers of alcohol which 22% are harmful drinker within age 25-39 years.
 - 23.9% of respondents were current user of tobacco products.
 - 6% reported that they had raised blood sugar but were not on treatment.
 - There is an increase in the proportion of overweight.
 - 86.4% of respondents have insufficient fruits and vegetable intake.

Based on the above findings, answer the following questions.

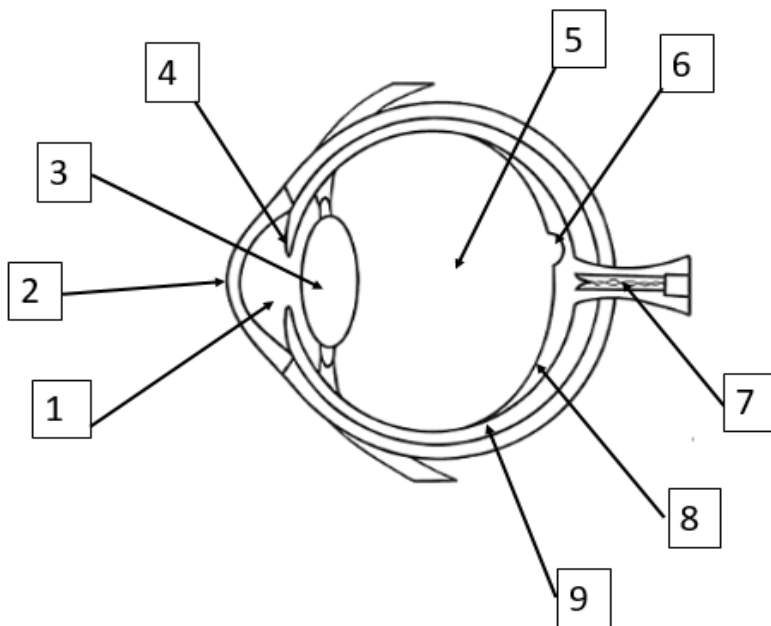
- a) Write down the possible consequences for the public and country if quick intervention is not implemented.
- b) As a health worker, what kind of strategy and policy you would advise to implement by the Department of Public Health to gradually improve the public health services in the country?
2. What are symptoms, mode of transmission and preventive measures for Monkeypox?
3. Name the structural parts of the human ear numbered 1-9 in the following diagram. Need not draw the diagram but list down the name of the structural parts with number on the answer sheet.



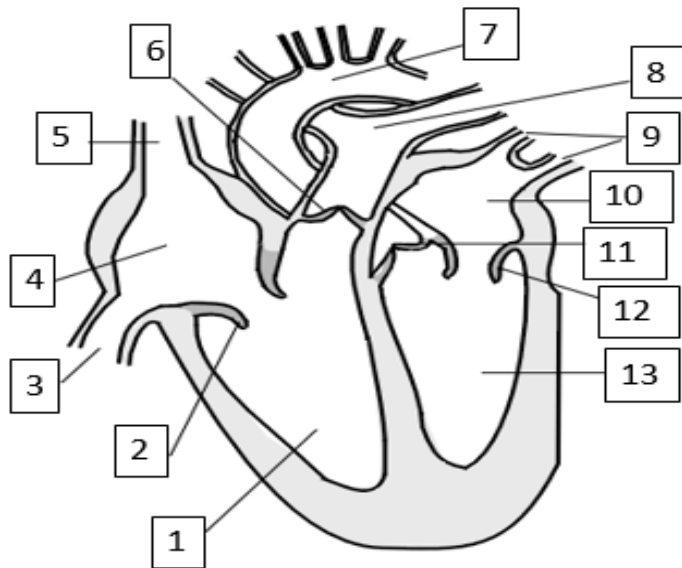
4. There are 5 different types of human teeth as shown in the diagram bellow. Name the teeth (1-5) and explain the function of each tooth.



5. From the diagram given below, write down the name of the parts of the human eye with correct sequence of the number 1-9 (diagram need not be drawn).



6. From the diagram given below, write down the name of the parts of the human heart with correct sequence of the number 1-13 (diagram need not be drawn).



7. Draw clear diagram of the glomerular filtration mechanism and show the following parts with clear arrow mark.
1. Renal artery
 2. Glomerulus
 3. Bowman's capsule
 4. Proximal convoluted tubule
 5. Loop of Henles
 6. Distal convoluted tubule
 7. Collecting duct
8. Explain Drug Sensitive TB (DS-TB), Extensive Drug Resistant TB (XDR-TB) and Multi-Drug Resistant TB (MDR-TB) and give atleast 3 important causes of increasing MDR-TB in Bhutan and its preventive measures?
9. Why do you think the Infection control and medical waste management system is important in the healthcare centres? Write down some important infection control and waste management practices you would follow when you work in the hospitals.
10. Draw a diagram and state the laws of reflection and explain their applications.

TASHI DELEK