

**ROYAL CIVIL SERVICE COMMISSION
BHUTAN CIVIL SERVICE EXAMINATION (BCSE) 2021
EXAMINATION CATEGORY: TECHNICAL**

PAPER II: GENERAL SUBJECT KNOWLEDGE PAPER FOR MEDICAL SCIENCE

Date	: October 30, 2021
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 **12 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. The term cell was first utilized by_____.
 - a) Tatum
 - b) Robert Hooke
 - c) Schwaan
 - d) De Bary

2. Microfilaments are composed of a protein(s). This(se) protein(s) is(are) called
 - a) Actin
 - b) Tubulin
 - c) Myosin
 - d) All of the above

3. Lysosomes are often known as scavengers of a cell. This is primarily due to _____ of lysosomes.
 - a) catalytic activity
 - b) hydrolytic activity
 - c) parasitic activity
 - d) anabolic activity

4. The oxygen and carbon dioxide cross the membrane by the process of _____.
 - a) osmosis
 - b) active diffusion
 - c) facilitated diffusion
 - d) passive diffusion

5. The food items especially those canned food can cause food poisoning. The toxin that causes poisoning is
 - a) Cholera toxin
 - b) Diphtheria toxin
 - c) Botulinum toxin
 - d) Tetanus Toxin

6. Total number of essential vitamins required for the proper functioning of the human body is
 - a) 12
 - b) 13
 - c) 14
 - d) 15

7. Which of the following vitamin is called water-soluble vitamin?
- Vitamin A
 - Vitamin D
 - Vitamin C
 - Vitamin K
8. Excessive consumption of calcium in our daily diet can result in
- Blabber stones
 - Blood vessel hardening
 - Biliary stones
 - Kidney stones
9. Human breath is “involuntarily during most of the times”. The center that controls this type of breathing are located in
- respiratory neuron in cerebrum.
 - neurons by pulmonary arterioles.
 - neurons of pons and medulla.
 - neurons of alveolar-capillary network.
10. The maximum volume of air that can be exhaled forcefully is called
- Tidal volume
 - Vital capacity
 - Total lung capacity
 - Expiratory volume
11. Which one of the following causes permanent hardness of water?
- Magnesium sulphate
 - Magnesium bicarbonate
 - Magnesium carbonate
 - Magnesium permanganate
12. _____ is present on the surface of the intestinal epithelial cells.
- Microvilli
 - Zymogen vesicles
 - Pinocytotic vesicles
 - Phagocytotic vesicles
13. Which of the following organs is known as “graveyard” of RBCs?
- Spleen
 - Kidney
 - Liver
 - Gall bladder

14. "Bundle of his" is an important part of
- Pancreas
 - Brain
 - Kidney
 - Heart
15. The building blocks of protein is
- Amino acids
 - Atom
 - Elements
 - Molecule
16. The "mitochondria" is richly found in which part of the human sperm?
- Head of the sperm
 - Middle part of the sperm
 - Tails end of the sperm
 - All of the above
17. The cartilage at the end of a long bone is called
- Fibrous cartilage
 - Elastic cartilage
 - Hyaline cartilage
 - Calcified cartilage
18. The tendency of an offspring to resemble its parents is known as
- Heredity
 - Inheritance
 - Resemblance
 - Variation
19. The balancing organ of the ear is
- Organ of Corti
 - Vestibular apparatus
 - Tectorial membrane
 - Cochlea
20. What is the shape of a growth curve in humans?
- S shaped
 - V shaped
 - C shaped
 - J shaped
21. As per the Constitution of Bhutan, _____ states that government must provide basic free health to all the citizens.
- Article 7
 - Article 8
 - Article 9
 - Article 10

22. As per the annual Health Bulletin 2020, which of the following diseases is not in the top 10 diseases?
- Diarrhoea
 - Peptic ulcer disorders
 - Accidents
 - Skins disorder
23. Antibodies play critical role in the defense of the body against various agents. The blood cell responsible for secreting antibodies in our body is
- Eosinophils
 - Monocytes
 - Lymphocytes
 - Neutrophils.
24. Which of the following cells is responsible for allergic reactions?
- Eosinophils
 - Monocytes
 - Neutrophils
 - Lymphocytes
25. Which one of the following is the hardest substance found in vertebrates?
- Chondrin
 - Dentine
 - Enamel
 - Keratin
26. Gross National Happiness is the guiding principle of Bhutan. There are 9 domain and 72 indicators to measure these 9 domains. Under the health domain, all of the following are indicators, EXCEPT
- Mental health
 - Alcohol
 - Disability
 - Healthy days
27. The medical Council is the apex body in Bhutan that is mandated to registration, CMEs and regulates quality of all health professionals. The correct full name of this Council is
- Bhutan Medical and Health Council
 - Bhutan Health and Medical Council
 - Bhutan Medical Council
 - Bhutan Health Council
28. What does the “19” in “Covid-19” refer to?
- There are 19 variants of the Coronavirus.
 - There are 19 symptoms of coronavirus disease.
 - This is the 19th Coronavirus pandemic.
 - The coronavirus and disease it caused were identified in 2019.

29. The world HIV Day is observed on
- 1st November
 - 1st December
 - 1st January
 - 1st March
30. The unit of power of a lens is
- Decibel
 - Joule
 - Diopter
 - Newton
31. A post-partum woman from a rural community gave birth to a baby boy with the help of a midwife. She brought her baby to the hospital with complaints of continuous bleeding from the umbilical stump. Bleeding is due to deficiency of vitamin
- A
 - D
 - E
 - K
32. HbA1c monitoring in a Diabetic is used to monitor diabetic control depending on the life span of RBC. The life span of RBC is _____ days.
- 100
 - 110
 - 120
 - 130
33. Erythropoietin is secreted by
- Spleen
 - Kidney
 - Liver
 - Thyroid
34. The process of coagulation is classically divided into how many pathways?
- 2
 - 3
 - 4
 - 5
35. There are 17 Sustainable goals proposed to transform the world. Good health and well-being are one of the 17 goals. It is goal number
- 1
 - 2
 - 3
 - 4

36. As of 30th September 2021, Bhutan had _____ deaths due to Covid-19.
- one
 - two
 - three
 - four
37. The Covid-19 vaccination drive in Bhutan has been rigorous. Bhutan has achieved
- 90% coverage of eligible adult population.
 - >90% coverage of eligible adult population.
 - <90% coverage of eligible adult population.
 - 100% coverage of eligible adult population.
38. Where will the image of a distant object be formed when a person using a concave lens to correct vision, is not using glasses?
- Behind the retina.
 - In front of the retina.
 - On the blindspot.
 - On the yellow spot.
39. A 45-year-old male patient developed severe anaphylaxis after a dose of amoxicillin. The most appropriate first line drug should be
- Diazepam
 - Hydrocortisone
 - Adrenaline
 - Chlorpheniramine
40. The most common Non-Communicable Disease (NCD) in Bhutan as of 2021 is
- Diabetes Mellitus
 - Stroke
 - Hypertension
 - Kidney Failure
41. Which one of the following Acts was amended recently by the Parliament of Bhutan?
- Alcohol Control Act of Bhutan
 - Tobacco Control Act of Bhutan
 - Mental health Act of Bhutan
 - Suicide Act of Bhutan
42. Bhutan's Health system is a robust system with coherent flow of patient and information, and is organized into _____ tier system.
- 3 (Referrals, Secondary and Primary centers)
 - 4 (National Referral, Regional Referral, District and Primary Health centers)
 - 5 (National, Regional referral, 40-60 bedded hospital, District and primary Centers)
 - All of the above

43. The hardest metal found on earth is
- Gold
 - Mercury
 - Tungsten
 - Lead
44. To prevent radiation from X-rays and Gamma rays, _____ is utilized especially in Radiology Department.
- Mercury lined wall
 - Silver lined wall
 - Lead lined wall
 - All of the above
45. The periodic table of elements contains
- Alkali metals
 - Transition metals
 - Noble gases
 - All of the above
46. Which one of the following will have maximum numbers of water molecules?
- 18 molecules of water
 - 1.8 grams of water
 - 18 grams of water
 - 18 moles of water
47. Radiodiagnosis is an important aspect of modern medicine. With progress in research in this field/specialty, a radiologist can choose number of radiodiagnosis tests. Which among the following has the highest level of radiation?
- X-ray
 - Ultrasound scan
 - CT scan
 - MRI scan
48. _____ isotope is commonly used in diagnostic procedures in many of the cancers.
- Potassium
 - Iodine
 - Titanium
 - Sodium
49. _____ is a process of breaking bigger molecules into smaller units that are either oxidized to release energy or used in other reactions.
- Anabolism
 - Catabolism
 - Metabolism
 - Catalytic reactions

50. Which of the following ions is essential for passage of signals from one nerve to another?
- Potassium
 - Hydrogen
 - Chloride
 - Sodium
51. Saliva in mouth plays important role in breaking down of food particles. This is primarily due to presence of which of the following salivary enzymes?
- Amylase
 - Pepsin
 - Lipase
 - Protease
52. Kidneys play critical roles in removal of waste products from the body. In addition to this role, kidneys also serve all of the following roles, EXCEPT
- Production of erythropoietin
 - Vitamin D metabolism
 - Production of certain enzymes
 - Body fluid balance.
53. Aum Pem is a known diabetic for last 10 years. She has been prescribed injection short-acting insulin to control sugar. This means her body is not able to produce any insulin. Which group of cells are dysfunctional in Aum Pem's body?
- Hepatocytes
 - Alpha cells
 - Beta cells
 - Delta cells
54. The reticular activating system (RAS) is responsible for arousal and sleep pattern in body. The RAS is located in the
- Frontal cortex
 - Brain stem
 - Cerebrum
 - Spinal cord
55. All of the following are primary colours, EXCEPT
- Blue
 - Green
 - Red
 - Violet
56. Snellen chart is used for testing
- Colour Vision
 - Central vision
 - Visual Acuity
 - Peripheral vision

57. Bhutan is increasingly witnessing huge burden of endocrine disorders and this is true especially in the recent years. As of 2021, Bhutan has _____ endocrinologists.
- 0
 - 1
 - 2
 - 3
58. _____ is a branch of medicine which deals with the incidence, distribution, and possible control of diseases.
- Biostatistics
 - Epidemiology
 - Health systems
 - Health economics
59. H. Pylori is the bacteria responsible for causing the gastric cancer. This organism best survives in
- slightly Acidic medium
 - strong Acidic medium
 - slightly Alkaline medium
 - strong Alkaline medium
60. Ozone absorbs harmful ultraviolet rays from sun, thereby preventing many of the skin conditions in humans. Ozone is located in _____ layer of the atmosphere.
- Mesosphere
 - Stratosphere
 - Troposphere
 - Thermosphere
61. Kawasaki disease is a condition that causes inflammation of
- Muscles
 - Blood vessels
 - Tendons
 - Bones
62. Night blindness is primarily caused by deficiency of vitamin
- A
 - B
 - C
 - K
63. There are 9 essential amino acids which play range of functions in our body. All of the following are essential amino acids, EXCEPT
- Glutamine
 - Histidine
 - Leucine
 - Methionine

64. Haemoglobin is mainly carrier of oxygen in the blood. Each Haemoglobin contains _____ heam units.
- 2
 - 3
 - 4
 - 5
65. The part of an eye that dilates and contracts based on the environment is
- Cornea
 - Lens
 - Pupil
 - Sclera
66. Hydrolysis of 1 molecule of ATP to ADP produces _____ of energy.
- 6.3 Kcal
 - 7.3 Kcal
 - 8.3 Kcal
 - 9.3 Kcal
67. All of the following drugs are classified under Non-Steroidal Anti-Inflammatory Drugs (NSAID), EXCEPT
- Aspirin
 - Indomethacin
 - Mefenamic acid
 - Paracetamol
68. _____ is most common form of mental disorder in Bhutan as per the report in 2020.
- Anxiety disorder
 - Bipolar disorder
 - Depression
 - Psychosis
69. Mr Jigme Thinley is a 25 years old civil servant and drives to office daily. However, he plays futsal 3 times a week for 2 hours each. What is the category of his physical exercise?
- Mild exercise
 - Moderate Exercise
 - Severe exercise
 - Extremely severe exercise
70. The process of conversion of sugar to alcohol is
- Fermentation
 - Infarction
 - Moulding
 - Nitrogen fixation

PART II – Short Answer Questions [30 marks]

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

1. List 6 building block of health systems. Describe one of them in 2-3 lines. (2+1 marks)
2. Oral health is one of the major problems in Bhutan. However most of the health workers are not even aware about the common oral health disorders at PHCs or at district level. If we are to increase early detection oral issues, we must build capacity of the health professionals. Describe resource smart 2 approaches to build the capacity of the health professionals. (1.5x2 marks)
3. Name two occupational health diseases commonly seen in Bhutan. Name the most appropriate diagnostic test for diagnosis of respiratory diseases? (1+2 marks)
4. ‘Out of pocket expenditure’ was 16% for Bhutan in 2018. This is interesting given the fact that health is totally free in Bhutan. Briefly describe 3 possible factors contributing to out of pocket expenditure? (3 marks)
5. What is EEG? Briefly describe the different types of brain waves? (1+2 marks)
6. What is Oxygen debt? (3 marks)
7. Draw and label an animal Cell. List a function each of 2 organelles. (2+1 marks)
8. Define diffusion and facilitated diffusion. List one primary difference between the two.
(2+1 marks)
9. What is the difference between renewable and non-renewable energy. Name 2 sources for each of them. (1+2 marks)
10. The ultrasound scan is a commonly used diagnostic test in modern medical practice. What is the principle of ultrasound scan? (3 marks)

TASHI DELEK