

**ROYAL CIVIL SERVICE COMMISSION  
BHUTAN CIVIL SERVICE EXAMINATION (BCSE) 2011**

**EXAMINATION CATEGORY: TECHNICAL  
PAPER II: GENERAL SUBJECT KNOWLEDGE FOR MEDICAL GROUP**

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**Date:** October 29, 2011  
**Maximum Marks:** 100  
**Examination Time:** 1.5 hours (90 minutes)  
**Reading Time:** 15 Minutes (Prior to examination time)

**1. General instructions**

- 1.1 Under the provision of Technical Graduates Selection Examination procedures of the Royal Civil Service Commission, candidates shall write their **Roll No.** only on the answer booklet provided separately. All questions should be answered in this answer booklet.
- 1.2 No other particulars that would indicate the identity of the candidate shall be written on the answer booklet. Any candidate found guilty of writing their particulars or making any identification marks in the answer booklet shall be disqualified from consideration of future employment by the RCSC.
- 1.3 This question booklet is the property of the RCSC and shall not be torn or removed from the examination hall. It consists of **13 printed pages** including this page. Any page found missing should be reported to the invigilators within the first 15 minutes of the receipt of the question booklet.
- 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 concerned authorities.

**Section A: Multiple choice question(70 marks)**

**Select one most correct or appropriate answer (1 mark each for every answer)**

1. Xylem and phloem are ..... tissues:

- a) ground
- b) dermal
- c) vascular
- d) both ( b) and (c)

2. Annual rings are the number of:

- a) rings of vascular bundles in a monocot stems
- b) layers of secondary xylem in a stem
- c) internodes in a stem
- d) both (b) and (c)

3 .Plant roots function to:

- a) anchor the plant
- b) store the products of photosynthesis
- c) produce hormones that stimulate stem growth
- d) all the above

4. Water evaporation from plant parts is called:

- a) translocation
- b) transpiration
- c) guttation
- d) tension

5. Which of the following lights is the most effective for photosynthesis?

- a) green
- b) yellow
- c) blue and red
- d) yellow and violet

6. The number of ATP molecules formed during photochemical reaction of photosynthesis is:

- a) 6
- b) 12
- c) 18
- d) 24

7. Fertilization of egg takes place inside the:

- a) anther
- b) stigma
- c) pollen tube
- d) embryo sac

8. Flowers emit fragrance:

- a) to purify air
- b) to attract insects
- c) to drive away flies
- d) to perform all the above mentioned functions

9. Seedlings grown in darkness

- a) are smaller than those grown in light
- b) are taller than those grown in light
- c) are of the same size
- d) none of the above

10. Which of the following connects a muscle to the bone?

- a) Cartilage
- b) Ligament
- c) Tendon
- d) Interstitial fluid

11. The largest number of cell bodies of neurons in our body is found in:

- a) Brain
- b) Tongue
- c) Kidneys
- d) Stomach

12. The sigmoid colon is a part of:

- a) large intestine
- b) small intestine
- c) pharynx
- d) rectum

13. Air or food is prevented from going in to the trachea during swallowing by the following:

- a) larynx
- b) epiglottis
- c) pharynx

d) tongue

14. Site of gaseous exchange in the lungs is:

- a) pulmonary chamber
- b) trachea
- c) bronchioles
- d) alveoli

15. Systole refers to the contraction of:

- a) major arteries
- b) SA node
- c) atria and ventricles
- d) all the above

16. In which of the following human structures are you least apt to find urine?

- a) large intestine
- b) urethra
- c) ureter
- d) bladder

17. Which of the following is mainly reabsorbed from the distal convoluted tubule of a nephron?

- a) water
- b) urea
- c) glucose
- d) NaCl

18. Pancreatic cells that secrete insulin are called:

- a) alpha cells
- b) beta cells
- c) chief cells
- d) delta cells

19. Which of the following is mismatched?

- a) semicircular canals – inner ear
- b) utricle and saccule – outer ear
- c) auditory canal – outer ear
- d) ossicles – middle ear

20. Most of the history of life concerns the evolution of :

- a) prokaryotes
- b) photo synthesizers
- c) plants and animals

d) eukaryotes

21. A manure containing a mixture of crop debris and cow dung is called:

- a) green manure
- b) farmyard manure
- c) composed manure
- d) bio-fertilizer

22. The HIV virus compromises the immune system mainly by infecting:

- a) cytotoxic T cells
- b) helper T cells
- c) suppressor T cells
- d) plasma cells

23. Excessive intake of alcohol damages:

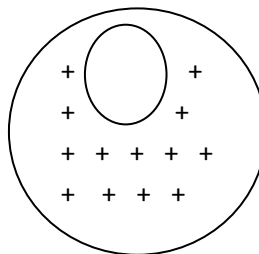
- a) liver
- b) lung
- c) kidney
- d) heart

24. When a glass rod is rubbed with silk, it acquires a positive charge because:

- a) protons are added to it
- b) electrons are added to it
- c) electrons are removed from it
- d) protons are removed from it

25. A spherical portion has been removed from a solid sphere having a charge distributed uniformly in its volume as shown in the figure. The electric field inside the emptied space is:

- a) zero everywhere
- b) non-zero and uniform
- c) non-uniform
- d) zero only at its centre



26. The anode in a dry cell is made of:

- a) zinc
- b) carbon
- c) copper
- d) lead

27. A moving electric charge produces:

- a) both electric and magnetic fields
- b) electric field only

- c) magnetic field only
- d) neither of these two field

28. A vertical wire carries a current in an upward direction. An electron beam sent horizontally towards the wire will be deflected:

- a) towards right
- b) towards left
- c) upwards
- d) downwards

29. The ozone layer:

- a) prevents infrared radiations from the sun
- b) prevents the ultraviolet radiations from the sun
- c) reflects the radio waves
- d) Prevents the infrared radiations reflected from the earth from escaping the earth's atmosphere.

30. In an AC circuit, power is consumed in:

- a) inductance only
- b) capacitance only
- c) resistance only
- d) all the three

31. Select the correct alternatives(s) : The magnitude of the emf across the secondary of a transformer does not depend upon :

- a) the magnitude of the emf across the primary
- b) turn ratio
- c) the resistance of the primary coil
- d) the resistance of the secondary coil

32. Heat radiations are:

- a) gamma rays
- b) microwaves
- c) infrared radiations
- d) radio waves

33. Choose the highest frequency waves:

- a) ground waves
- b) sky waves
- c) television waves
- d) visible light waves

34. The interference phenomenon can take place:

- a) in all waves
- b) in the transverse waves only
- c) in the longitudinal waves only
- d) In the standing waves only.

35. Light appears to travel in straight line because:

- a) it is not absorbed by the atmosphere
- b) it is reflected by the upper part of the atmosphere
- c) its wavelength is very small
- d) its speed is very large

36. Which of the following phenomenon cannot take place in the sound waves?

- a) reflection
- b) interference
- c) diffraction
- d) polarization

37. The condition for removing spherical aberration by two thin lenses separated by a distance  $d$  is :

- a)  $d = f_1 + f_2$
- b)  $d = \frac{f_1 + f_2}{2}$
- c)  $d = \frac{f_1 - f_2}{2}$
- d)  $d = f_1 - f_2$

38. Classically, the proposed circular path of an electron in the Rutherford's nuclear model of an atom would be:

- a) circular
- b) parabolic
- c) spiral
- d) straight

39. Which of the parameters are same for all hydrogen-like atoms and ions in the same energy state?

- a) radius of orbit
- b) speed of electron
- c) energy of electron
- d) angular movement of electron

40. In which region of the electromagnetic spectrum does the Lyman series of hydrogen lie?

- a) ultraviolet
- b) infrared
- c) visible
- d) X-ray.

41. The X-ray region lies between:

- a) short radio waves and visible region
- b) visible and ultraviolet regions
- c) gamma ray and ultraviolet region
- d) short radio waves and microwaves

42. The nature of light waves is similar to

- a) cathode rays
- b) beta-rays
- c) gamma rays
- d) alpha rays

43. An electric field can deflect:

- a) X-rays
- b) Neutrons
- c) Alpha particles
- d) Gamma rays

44. The atomic number of an atom is:

- a) Number of protons in the nucleus of the atom
- b) Number of neutrons in the nucleus of the atom
- c) Number of nucleons in the nucleus of the atom
- d) Number of protons plus the electrons in the atom

45. The mass number of the atom is :

- a) Number of protons in the nucleus
- b) Number of neutrons in the nucleus
- c) Total number of protons and neutrons in the nucleus
- d) Number of electrons in the atom

46. In some substances, charge can flow at ordinary temperature, but not at very low temperature. These are called:

- a) Conductors
- b) Insulators
- c) Semiconductors
- d) Dielectrics.

47. In a good conductor the energy gap between the valence and the conduction band is:

- a) Infinite
- b) Wide



- c) Narrow
- d) Zero

48. A 500 g toothpaste sample has 0.2 g fluoride concentration. What is the concentration of fluorine in terms of parts per million (ppm) levels?

- a) 250
- b) 200
- c) 400
- d) 1000

49. A membrane which allows the passage of only solvent and not of solute particles is called

- a) Permeable membrane
- b) Semi-permeable membrane
- c) Non-permeable membrane
- d) (a) and (b)

50. During the formation of a chemical bond potential energy of the system is:

- a) Increases
- b) Decreases
- c) Neither increases nor decreases
- d) Remain constant

51. KCl readily dissolves in water because:

- a) It is a salt of K
- b) It reacts with water
- c) It is a electrovalent compound
- d) Its ions are easily solvated

52. Which one is not a property of crystalline solid?

- a) Isotropic
- b) Sharp melting point
- c) A definite and regular geometry
- d) High intermolecular forces.

53. Evaporation of water is:

- a) A process in which heat is neither evolved nor absorbed
- b) A process accompanied by chemical reaction
- c) An exothermic change
- d) A endothermic change

54. The most suitable indicator for the titration of a weak acid against a strong base is :

- a) Phenolphthalein

- b) Litmus
- c) Methyl orange
- d) Thymol blue

55. Molten sodium chloride conducts electricity due to the presence of

- a) Free electrons
- b) Free ions
- c) Free molecules
- d) Free atoms of sodium and chloride

56. Metal present in chlorophyll is:

- a) Zinc
- b) Magnesium
- c) Calcium
- d) Sodium

57. The hardness of water is estimated by:

- a) Conductivity method
- b) EDTA method
- c) Titrimetric method
- d) Distillation method

58. Which one is the strongest reducing agent?

- a) HF
- b) HCl
- c) HBr
- d) HI

59. Ozone is

- a) A compound of oxygen
- b) An allotrope of oxygen
- c) An isotope of oxygen
- d) An isobar of oxygen

60. Hydrogen chloride gas can be dried by passing it

- a) Over quick lime
- b) Over P<sub>2</sub>O<sub>5</sub>
- c) Through dilute sulphuric acid
- d) Through conc. sulphuric acid

61. Transition element belongs to

- a) s-block

- b) p-block
- c) d-block
- d) none

62. Stainless steel contain mainly iron and carbon along with

- a) Co and Mn
- b) Mn and Ni
- c) Cr and Co
- d) Ni and Cr

63. Dental amalgam used for filling teeth consist of

- a) Ag and Hg
- b) Au and Hg
- c) Au , Sn and Hg
- d) Ag, Sn and Hg

64. Carbohic acid is

- a) Phenol
- b) Phenyl benzoate
- c) Phenyl acetate
- d) Salol

65. Isocyanide test is used for the detection of

- a) Primary alcohols
- b) Primary amines
- c) Secondary amines
- d) Secondary alcohols

66 .The material used as coating material for non stick pan is

- a) Polystyrene
- b) Terylene
- c) Teflon
- d) PVC

67. Which of the following belong to the class of natural polymers?

- a) Proteins
- b) Cellulose
- c) Rubber
- d) All the above

68. The disease Kwashiorkor is caused by the deficiency of

- a) Enzymes

- b) Essential amino acids
- c) Non essential amino acids
- d) None of these

69. Which of the following is not a reducing sugar?

- a) Maltose
- b) Sucrose
- c) Lactose
- d) Glucose

70. Pernicious anemia is caused by the deficiency of

- a) B1
- b) B2
- c) B6
- d) B12

## Section B : Short Answer Questions

2011

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Answer all questions in brief in the space provided below. (3 marks for each question)

1. With reference to human dentition explain the term diphyodont. What is the dental formula? Name the function of each type of teeth?
2. Explain the term
  - 1) ECG (Electrocardiograph)
  - 2) EMG (Electromyography)
  - 3) EEG (electroencephalograph)
3. Name three gram positive organisms? Name one clinical disease each would cause?
4. What is the causative agent for TB? What laboratory test you would conduct to confirm the diagnosis? What do you understand by the term Acid Fast bacilli?
5. Define the terms digestion and Assimilation. Name the enzyme that digests fats. Why the proteases are generally released in the inactive form?

- 6 Name three important zoo-notic diseases prevalent in Bhutan. How would you prevent rabies in your community?
  
- 7 Define refractive error. What is short sightedness and long sightedness? How would you correct the error?
  
- 8 Differentiate between
  - 1) CT Scan and PET scan
  - 2) ECG and EEG
  - 3) Implants and Prosthesis
  
- 9 Differentiate between Isometric exercise and Isotonic exercise. Outline one use of ultrasound and one use of infrared rays in physiotherapy
  
10. Write short notes on Telemedicine and Video-conference with regard to its application in patient care in Bhutanese context.