

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

PAPER II: GENERAL SUBJECT KNOWLEDGE FOR MEDICAL GROUP

Date	: 1 October 2016
Total Marks	: 100
Examination Time	: 90 minutes (1.5 hours)
Reading Time	: 15 minutes (prior to examination time)

GENERAL INSTRUCTIONS

1. Write your Registration Number clearly and correctly in the Answer Booklet.
2. The first 15 minutes are to check the number of pages, printing errors, clarify doubts and to read the instructions in Question Paper. You are NOT permitted to write during this time.
3. This paper consists of **TWO Parts, namely Part I and 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 must be written in the Answer Booklet provided to you. You will not be given any marks for answers written other than in the Answer Booklet. Ask for additional Answer Booklet if required.
6. All answers should be written with correct numbering of Part, Section and Question Number in the Answer Booklet provided to you. Note that any answer written without indicating any or correct Part, Section 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. You are required to hand over the Answer Booklet to the Invigilator before leaving the examination hall.
10. This paper has **15 pages** including this Instruction Page.

GOOD LUCK!

PART – I : MULTIPLE CHOICE QUESTIONS

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

1. All the Following are examples of edible roots **EXCEPT**
 - a. Carrot
 - b. Radish
 - c. Potato
 - d. Turnip
2. Non citrus fruit among the following is
 - a. Tangerine
 - b. Lemon
 - c. Orange
 - d. Plum
3. A dried grape placed in a container of water gets swell due to
 - a. Osmosis
 - b. Endosmosis
 - c. Exosmosis
 - d. Ultra filtration
4. The correct formula for the process of photosynthesis is
 - a. $6\text{CO}_2 + 6\text{H}_2\text{O} + \text{light energy} = \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$.
 - b. $\text{CO}_2 + \text{H}_2\text{O} + \text{light energy} = \text{C}_6\text{H}_{12}\text{O}_6 + \text{O}_2$.
 - c. $\text{CO}_2 + 6\text{H}_2\text{O} + \text{light energy} = 6 \text{C}_6\text{H}_{12}\text{O}_6 + \text{O}_2$.
 - d. $6\text{CO}_2 + \text{H}_2\text{O} + \text{light energy} = 6 \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$.
5. All the following cause zoonotic diseases **EXCEPT**
 - a. Anthrax
 - b. Brucella
 - c. Rabies virus
 - d. Vibrio cholerae
6. Choose the INCORRECT difference between bacteria and virus:
 - a. Bacteria have cell wall but viruses do not have cell wall.
 - b. Viruses are smaller than bacteria.
 - c. Bacteria are visible under light microscope but viruses are not visible.
 - d. DNA is enclosed inside nucleus in bacteria and in a coat of protein in viruses.
7. Which structure is not part of an animal cell?
 - a. Centrosome
 - b. Ribosome
 - c. Golgi bodies
 - d. Cellulose

8. Ciliated epithelium is seen in
 - a. Trachea
 - b. Intestine wall
 - c. Stomach wall
 - d. Nasal chamber

9. A child with Down syndrome has
 - a. 44 chromosomes
 - b. 45 chromosomes
 - c. 46 chromosomes
 - d. 47 chromosomes

10. Choose the INCORRECT description of window period for HIV in the body:
 - a. Person can be infected with HIV during the window period.
 - b. HIV remains very infectious in window period.
 - c. Window period lasts for four weeks.
 - d. Serum test for HIV sometimes show weak positive during window period.

11. March 24th is observed as
 - a. World's TB Day
 - b. World's AIDs Day
 - c. International Diabetic Day
 - d. World's Cancer Day

12. The International Agency for Research on Cancer concluded that, chewing betel nut (Doma) is carcinogenic (cancerous) to humans. Choose the point which has not been reported by the Researchers:
 - a. Betel nut containing three main chemicals arecoline, arecaidine and guvacine has vasoconstricting properties that affect almost all the organs.
 - b. The betel leaf is usually seen available very dirty forming a main source of helicobacter pylori infection ultimately leading to stomach cancer.
 - c. Lime or calcium carbonate paste used in mixture erodes epithelial layer of the esophagus, stomach and intestine leading to cancer.
 - d. Chewing Doma has been reported to be more carcinogenic than tobacco which needs to be banned in Bhutan.

13. Select the INCORRECT matching of the anatomical structure with respective organ system of human body:
 - a. Circle of Willis Part of circulatory System
 - b. Bowman capsule.....Part of Excretory System
 - c. Patella.....Part of Skeletal System
 - d. Stape.....Part of Muscular System

14. Which of the following hormones is important for general metabolic activities of the body?
- Triiodothyronin
 - Insulin
 - Aldosterone
 - Antidiuretic hormones
15. Total number of spinal nerves in Human is
- 31
 - 62
 - 124
 - 61
16. The target organ for oxytocin is
- Liver
 - Kidney
 - Uterine muscles
 - Mammary glands
17. Vitamin D is synthesized in the skin by the action of sun light on
- Cholesterol
 - 7-hydroxy cholesterol
 - Cephalin cholesterol
 - All the above
18. Thiamine (B1) deficiency results in
- Wernicke's syndrome
 - Korsakoff's syndrome
 - Osteonecrosis
 - Tunnel vision
19. The lobe of the brain that has function for vision is
- Temporal
 - Frontal
 - Parietal
 - Occipital
20. The incidence rate of stomach cancer has been reported to be highest in Bhutan among Asian Countries. All the following are the factors that cause stomach cancer in Bhutan **EXCEPT**
- chewing doma
 - eating Junk foods
 - eating dried products (Shakam, Sikam & Churkam)
 - heavy intake of alcohol

21. Which of the following statement is true for lymph?
- Transport oxygen to the brain
 - Transport CO₂ to the lungs
 - Return RBCs to the lymph nodes
 - Return interstitial fluids to the blood
22. The role of pacemaker in heart is to
- accelerate blood circulation
 - inhibit backflow of the blood
 - initiate heart beat
 - stimulate blood pressure
23. During an earthquake, scared residents start to rush down the stairs to escape out of the high rise building. Which hormone initiates this action?
- Adrenaline
 - Glucagon
 - Gastrin
 - Thyroxin
24. Choose the INCORRECT description about colour blindness:
- Colour blindness is usually inherited and is present at birth.
 - It is caused due to absence of one or more of the three cone cells responsible for sensing red, green, or blue light.
 - Colour blindness cannot see three basic colors.
 - It can be corrected by taking vitamin A or by surgical intervention.
25. How do sympathetic neural signals effect the working of the heart?
- Reduce both heart rate and cardiac output.
 - Heart rate is increased without affecting the cardiac output.
 - Both heart rate and cardiac output increases.
 - Heart rate increases but cardiac output decreases.
26. Person with blood group O Positive is considered universal donor because
- both A & B antigen present on RBCs but no antibodies in the plasma.
 - both A and B antibodies in the plasma.
 - no antigen on the RBCs and no antibodies in the plasma.
 - both A and B antigens are absent on RBCs but has only antibodies.
27. Function of molar and premolar teeth is
- Grinding
 - Cutting
 - Tearing
 - All the above

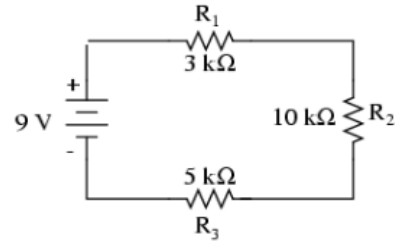
28. Which one of the following descriptions is INCORRECT about retina?
- Retina is the light absorbing portion of the visual photo pigments.
 - Retina has photo pigment called rhodopsin.
 - Retina is derivatives of vitamin E.
 - Cones have photo receptors for colour vision.
29. Choose the correct order and number of vertebrae in human vertebral column:
- C₅-Th₁₀-L₅-S₅-Ca₄
 - C₄-Th₁₁-L₅-S₅-Ca₄
 - C₇-Th₁₂-L₅-S₅-Ca₄
 - C₁₀-Th₁₂-L₃-S₄-Ca₃
30. Ministry of Health (MoH) in collaboration with National Housing Development Corporation (NHDC) and with financial support from the World Health Organization (WHO) launched the open-air gyms not only in Thimphu but also in other district towns. Choose the most suitable purpose of this initiative by the MoH:
- To promote a healthy lifestyle of the people living in the cities.
 - To address rising non-communicable diseases (NCDs) in the country.
 - To minimized abuses with drugs, alcohol and smoking through healthy activities.
 - To minimize the gang fights and vandalism in the cities.
31. Use of traditional healing method by making incision of the skin is believed to provide a psychological relieve when blood clot is formed on exposing blood to the air. A blood clot formed is believed as removal of disease from the body. However, the practice needs to be discouraged since there is risk of infection and septicemia which is being often reported in the hospitals. Choose the correct measures to be taken to discourage this practice:
- Convince the people on false believe and educate them on risk of infection when cuts are made on the skin.
 - Legalize the practice but educate the people on infection control management.
 - Penalize the practioners with fine when he/she is found practicing.
 - No intervention required since the practice dates back to our ancestors period.
32. Illegal drug trafficking has been increased in Bhutan that threatens the health and happiness of the Bhutanese society. Choose the most appropriate measures that you think will be able to reduce the drug usage:
- Strengthen the existing screening system at the airport.
 - Change the existing Laws of the country for drug usage.
 - Include lessons in the school curriculum on effect of drugs on health and well being of the society.
 - Introduce a system of providing regular classes on Affect of Drugs and care of children for the parents by the schools.

33. Total number of bones in human body is
- 206
 - 207
 - 205
 - 204
34. Myxedema is a disease caused due to insufficient production of
- TSH only
 - T3 & T4
 - T3 only
 - All the above three
35. The ions involved in Acid - Base balance of the body is
- H^+ only
 - HCO_3^- only
 - Both H^+ & HCO_3^-
 - PO_4 only
36. Which of the following is not a hereditary disease?
- Cretinism
 - Thalassemia
 - Hemophilia
 - Cystic fibrosis
37. Choose the INCORRECT functions of blood circulation system in the human body:
- Venous blood is returned to the right atrium through superior and inferior venacava.
 - Pulmonary vein carries oxygenated blood from the lungs to the left atrium.
 - Pulmonary artery returns deoxygenated blood from the body to the lungs.
 - Left auricle receives deoxygenated blood from the lungs.
38. In Radio diagnosis, CT Scanning uses
- Ultrasound Waves
 - Gamma Rays
 - X-Rays
 - Infrared rays
39. Choose the best benefit of the morning walk in terms of health promotion:
- It freshens up our mind and prevents mental deterioration.
 - It is a good physical exercise that prevents NCDs.
 - It provides sound sleep and improves appetite.
 - It reduces the mental stress.
40. Choose the INCORRECT description of the electric fuse:
- It is designed to melt for breaking a circuit in the event of excessive current.
 - It protects the wiring and the equipments.
 - It operates on the principle of heating effect of electric current.
 - Lead wire is commonly used to make fuse.

41. Tube light is more efficient than tungsten bulb for domestic use because
- tube light doesn't produce heat like bulb and consumes less current than tungsten bulb
 - tube light does not require tungsten filament whereas tungsten bulb requires it.
 - tube light produce light brighter than tungsten lamp.
 - tube light is cheaper than tungsten bulb.
42. The purpose of hanging a metallic chain to the ground from a truck carrying highly inflammable material is
- to prevent spark due to the charge developed on the body of the truck due to high speed.
 - to convey excess heat from the engine of the truck
 - to reduce the noise of the truck coming into the cabin.
 - None of the above
43. The unit of electrostatic charge is
- Coulomb
 - Watt
 - Electron volt
 - Farad
44. At a constant temperature, current flowing through a conductor of uniform area of cross-section is proportional to the difference of potential across its material. This is the statement of:
- Joule' Law
 - Coulomb's Law
 - Ohm's Law
 - None of the above
45. All the following factors affect the electrical resistance of conductor **EXCEPT**
- Length of conductor.
 - Area of cross section.
 - Temperature.
 - Strength of current.
46. Battery arrangement in torch is an example of
- cells connected in series.
 - cells connected in parallel.
 - resistance in series.
 - resistance in parallel.
47. The unit of current capacity of car battery is measured in
- Ampere hour
 - Ohm
 - Electron volt
 - Farad

48. In the diagram of the series circuit, the total resistance is

- 2.2 Ω
- 18 Ω
- 2 Ω
- 10



49. During a car accident with head on collision, the passenger in the front seat and driver usually breaks the windshield and injures the head. The reason for this forward movement when a car stops abruptly will be better explained by

- Newton's First Law of Motion
- Newton's second Law of motion
- Newton's Third Law of motion.
- All of the above.

50. The kerosene floats on the water due to

- difference in mass.
- difference in specific gravity.
- difference in volume.
- difference in chemical composition.

51. Smell of the burning incense in a room slowly disappears due to

- Diffusion
- Brownian motion
- Osmosis
- Gravitational force

52. The electromagnetic radiation with shortest wavelength is

- Ultraviolet rays
- X-Rays
- Radio waves
- Infrared

53. ALTO 800 Car has the engine displacement of 796 cc. Choose the correct definition of the Engine displacement of a car:

- It is a swept volume of the pistons inside a car engine in a single movement that reflects the power of engine expressed in cc or cm^3 .
- It is the measurement unit of the fuel consumption rate of a car expressed in cc or cm^3 .
- It is the measurement unit for the amount of energy produced by engine expressed in cc or cm^3 .
- None of the above.

54. It is difficult to hit the head of a fish in a pond by using catapult when aimed from the side of a pond because of
- fastness of the movement of a fish.
 - change in position due to refraction of light in denser medium.
 - reflection of the light that makes fish invisible.
 - resistance of the water to the force of moving stone.
55. Molality of the solution is defined as
- the number of moles of a substance per liter of solution.
 - the number of moles of solute per kg of solvent.
 - number of grams of substance per liter of solution.
 - number of grams of solute per kilogram of solvent.
56. Diamond is considered the most precious substance. Choose the incorrect description of its properties:
- It is the hardest substance in the earth existence.
 - It is highly transparent with high lustre which glitters in the light.
 - It is non malleable, non ductile and stable to Chemical and heat up to 875°C .
 - It is one of the heavy metals that poorly conduct electricity.
57. The carbon rode in the middle of the torch battery is
- Positive electrode
 - Negative electrode
 - Conducting medium
 - None of the above
58. The heaviest metal in the periodic table is
- Osmium
 - Mercury
 - Gold
 - Silver
59. Which of the following is good conductor of heat and electricity?
- Diamond
 - Graphite
 - Charcoal
 - Anthracine
60. All the following describes characteristics of catalyst **EXCEPT**
- Remain unchanged after reaction both in quantity and composition.
 - Requires only small quantity to affect large quantities of reactants.
 - Catalyst accelerates both reverse & forward reaction.
 - Catalyst is capable of starting a reaction.

61. 10 moles of solute is dissolved in 5 litres of sodium chloride solution. What is its molarity?
- 5 molar
 - 2 molar
 - 2.5 Molar
 - 12.5 Molar
62. Bleaching powder containing calcium hypochloride ($\text{Ca}(\text{ClO})_2$) is commonly employed as disinfectant for the biological wastes generated from the hospitals and BHUs in Bhutan. The disinfecting action of this powder is due to
- Calcium
 - Oxygen
 - Chlorine
 - All the above.
63. A noble gas used in the beacon light to convey the message of emergency patients inside ambulance is
- Helium
 - Neon
 - Argon
 - Xenon
64. Which of the following vitamins is involved in blood clotting?
- Vitamin AS
 - Vitamin B Complex
 - Vitamin D
 - Vitamin K
65. Gypsum mining started in 1980s in Pema Gatshel has been one of the important sources of revenue for the country. It is composed of calcium sulfate dehydrate ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$). It is used to produce the following industrial products **EXCEPT**
- Cement
 - Fertilizer
 - Tiles
 - Linen
66. According to the report from the Royal Society of Chemistry, mercury in thermometers has been replaced by ionic liquids (IL). The primary reason for this change is because
- mercury is poisonous.
 - IL response faster than mercury to the temperature.
 - IL is non toxic.
 - IL can operate over a wider range of temperature.

67. What is the main composition of tooth paste that kills the bacteria to prevent decaying the teeth?
- Bromine
 - Chlorine
 - Iodine
 - Fluorine
68. Which of the following is the least important source of energy for the body?
- Glucose
 - Glycogen
 - Ribose
 - Galactose
69. All of the following can store glycogen, EXCEPT
- Nervous
 - Skeletal muscle
 - Liver
 - Cardiac muscle
70. Pepper called '*thingye*' is a popular spice eaten by Bhutanese in different form of dishes to make them spicy. The spiciness of the pepper is due to a chemical called
- Piperine
 - Formic acid
 - Abscisic Acid
 - Capsaicin

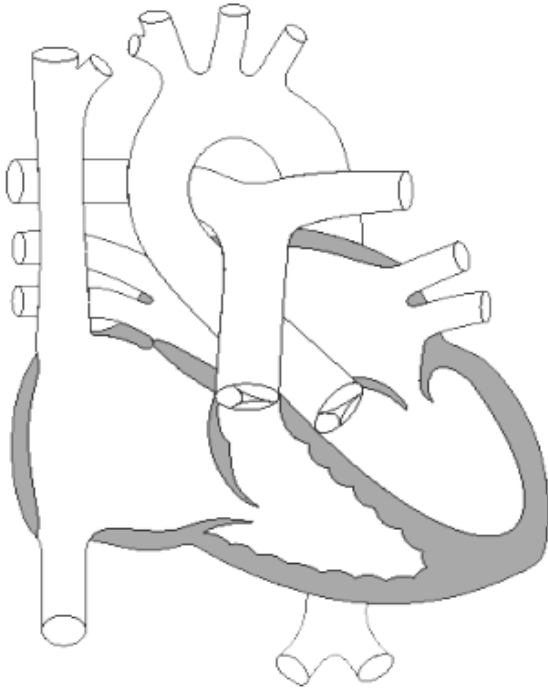
PART II: SHORT ANSWER QUESTIONS

This part consists of 10 Short Answer Questions. Answer all questions. Each question carries THREE marks.

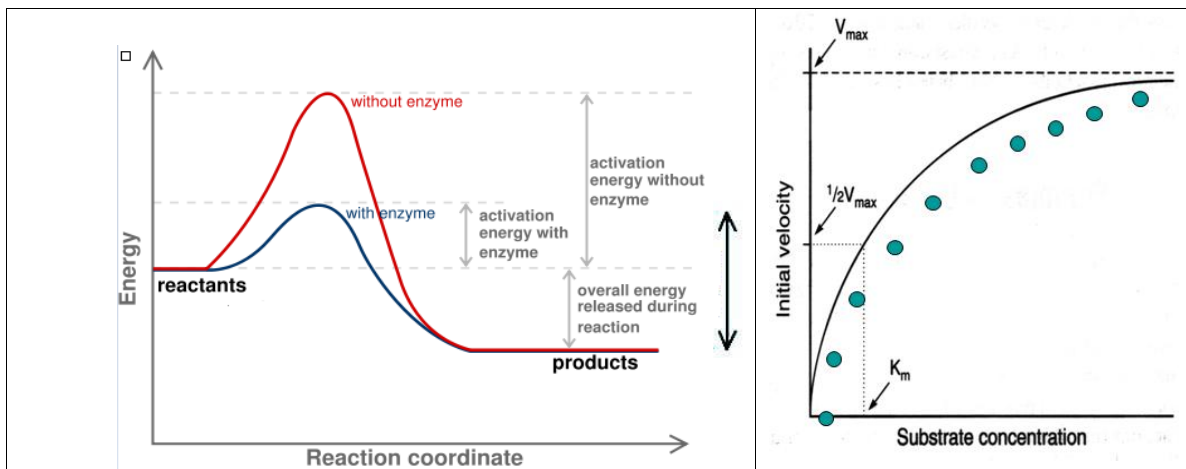
- Bhutan is worldwide popular for availability and use of renewable natural resources for production of electricity. Name at least three most common renewable resources being utilized in Bhutan and briefly explain the principle of each power plant.
- Locally brewed alcohol known as *Ara* is prepared from variety of cereals and fruit products. It is widely used especially in the east during social gathering such as rituals and festivals. However, it is found that its disadvantages exceed benefits especially for the rural people. In some villages, *Ara* has badly affected the economy of the family and created social problems due to heavy consumption. Jigme Dorji Wangchuk National Referral Hospital in Thimphu reports the highest death every year due to Alcohol Liver Diseases (ALD) for which *Ara* is one of the reasons.
 - Explain briefly how the consumption of alcohol causes ALD.
 - Write down at least 5 measures you would suggest to discourage the consumption of alcohol.

3. Honorable Prime Minister of Bhutan in his speech during his foreign visit in February 2016 said **“This country isn't just carbon neutral, it is carbon negative”**.
 - a) Explain why do you think Bhutan is not only carbon neutral but also carbon negative?
 - b) Give few examples to justify that Bhutan has no role in increasing Global Warming Effect but promote its prevention.

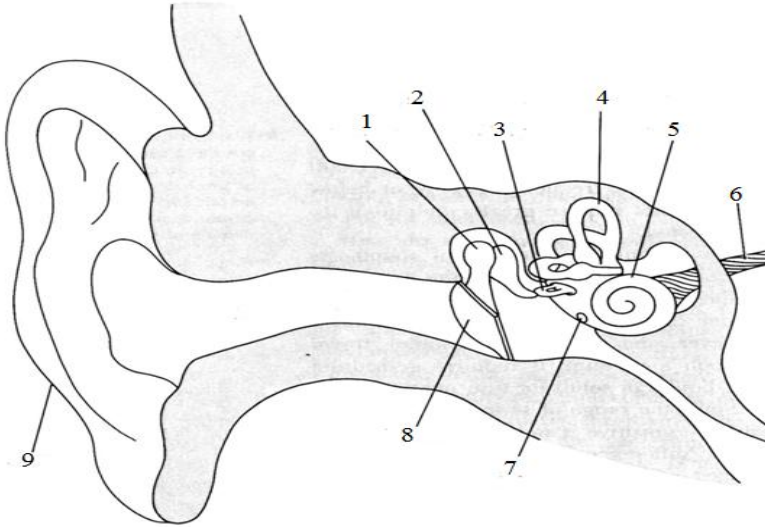
4. Copy the diagram of the heart and indicate with the arrows the direction of the flow of blood in and out of the heart. Name the valves present in human heart with their location.



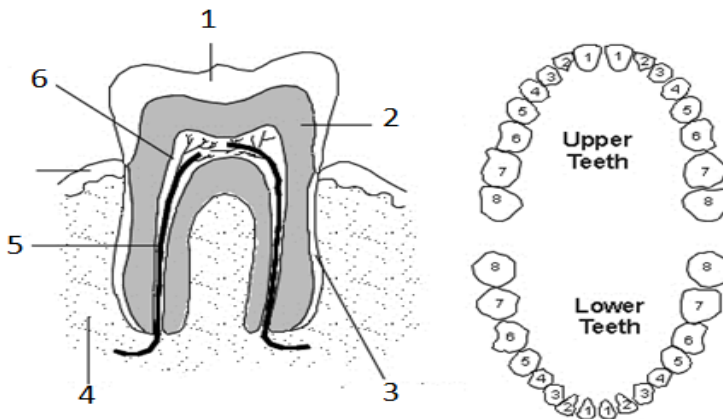
5. Explain what you understand from the following two graphs regarding catalytic action of enzymes. Explain V_{max} and K_m and write some important characteristics of a catalyst.



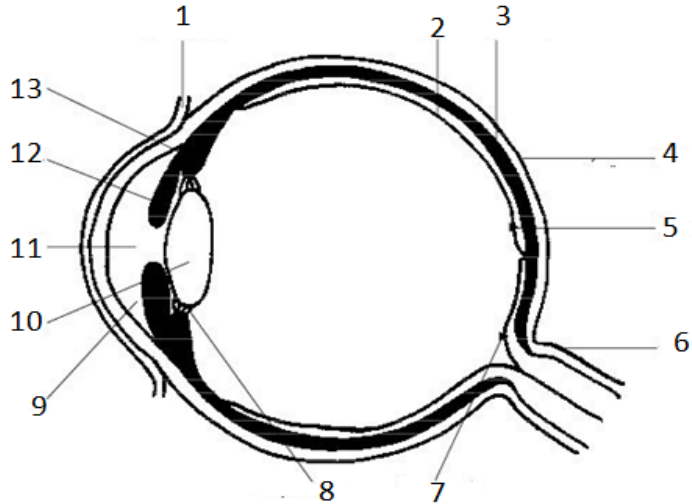
6. Why do you think the Infection control and medical waste management system is important in the healthcare centres? Write down some important infection control and waste management practices you would follow when you work in the hospitals.
7. Name the structural parts of the human ear numbered 1-9 in the following diagram. Need not draw the diagram but list down the name of the structural parts with number on the answer sheet.



8. Classify the teeth 1-8 on the right and name the structural parts number 1-6 on the left. Need not draw the diagram but list down the name of the structural parts with number on the answer sheet.



9. Name the structural parts of the human eye numbered 1-13 in the following diagram. Need not draw the diagram but list down the name of the structural parts with number on the answer sheet.



10. A simple survey on patient satisfaction conducted by Hospital Administration and Management Transformation (HAMT) program showed that majority of the patients are not satisfied with:
- a) Behavior of the staff
 - b) communication skills of the staff
 - c) OPD waiting Time
 - d) Emergency response of the staff.

Explain some ways how you are going to help HAMT Program and the management to improve the patient satisfaction.