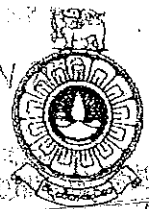


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THE OPEN UNIVERSITY OF SRI LANKA
FACULTY OF HEALTH SCIENCES
DEPARTMENT OF MEDICAL LABORATORY SCIENCES
ACADEMIC YEAR 2018/2019 – SEMESTER II

25 NOV



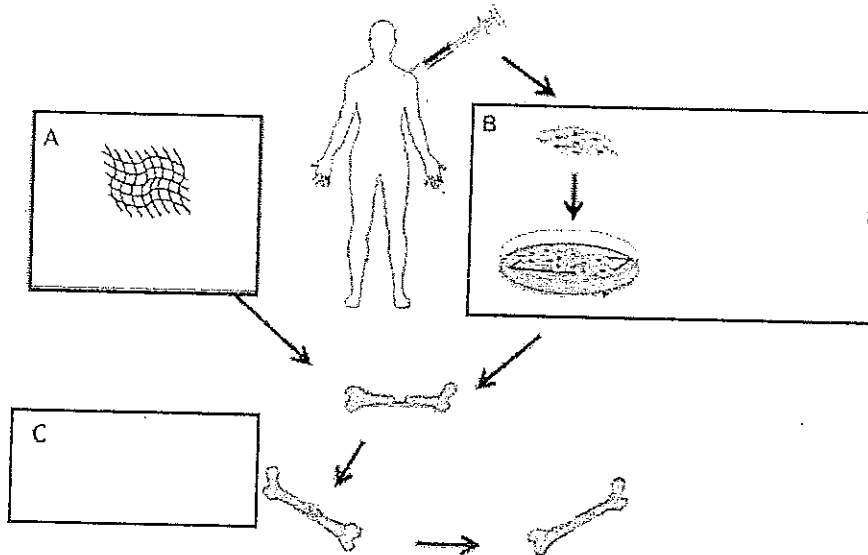
BACHELOR OF MEDICAL LABORATORY SCIENCES (BMLS) HONOURS
MDU5209 – ADVANCED TECHNIQUES IN MEDICAL LABORATORY SCIENCES
FINAL EXAM
DURATION: 2 HOURS

DATE: 25TH NOVEMBER 2019

TIME: 1.30 PM – 3.30 PM

PART B – Structured Essay Questions (60 marks)

1. Nanotechnology heavily contributes to improvements in artificial bone and joint implants through nanoengineered materials like hydroxyapatite. Given below is a schematic diagram on the use of nanohydroxyapatite for controlled tissue regeneration and production of artificial bone implants.



- 1.1. Identify the key components in A, B, C and name them. (12 marks)
- 1.2. How could nanohydroxyapatite aid the bone reconstruction in artificial bone regeneration applications? (08 marks)
- 1.3. Biosynthesis of nanoparticles has been proposed as a cost-effective and environmentally friendly alternative to chemical and physical methods. Using a diagram briefly explain how metallic nanoparticles could be synthesized via these approaches. (20 marks)

(Total: 40 marks)

2.

- 2.1. Define the term “protein sequencing”. (05 marks)
- 2.2. Name two (02) major direct methods of protein sequencing. (04 marks)
- 2.3. Name two (02) substances which can be used to cell lysis. (04 marks)
- 2.4. What is the importance of protease inhibitors in protein extraction process? (06 marks)

- 2.6. "Affinity chromatography is the most specific chromatography method". Are you in agreement with this statement? Explain your answer. (12 marks)
- 2.7. Name two methods of polypeptide fragmentation. (04 marks)
- 2.8. Name a reagent used to confirm the presence of protein in a sample qualitatively. (02 marks)
- (Total: 40 marks)**

3.

- 3.1. Write the 3 R's concept in laboratory animal experiments. Give an example for each. (24 marks)
- 3.2. Write three (03) purposes of making animal models. (06 marks)
- 3.3. List the advantageous of metabolic cages. (02 marks)
- 3.4. What is the importance of incorporating more fiber to the diet of rabbits? (02 marks)
- 3.5. Write two (02) routes of parenteral administration. (02 marks)
- 3.6. Write two (02) factors which are important in selecting the blood drawing method in laboratory animals. (02 marks)
- 3.7. What is the reason for dipping the tail in warm water prior to blood collection from rat tail vein? (02 marks)
- (Total: 40 marks)**

PART C – Essay Questions (20 marks)

1. Write short notes on the following.
1. Ion exchange chromatography
 2. SDS gel electrophoresis

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Part B – Structured Essay Questions

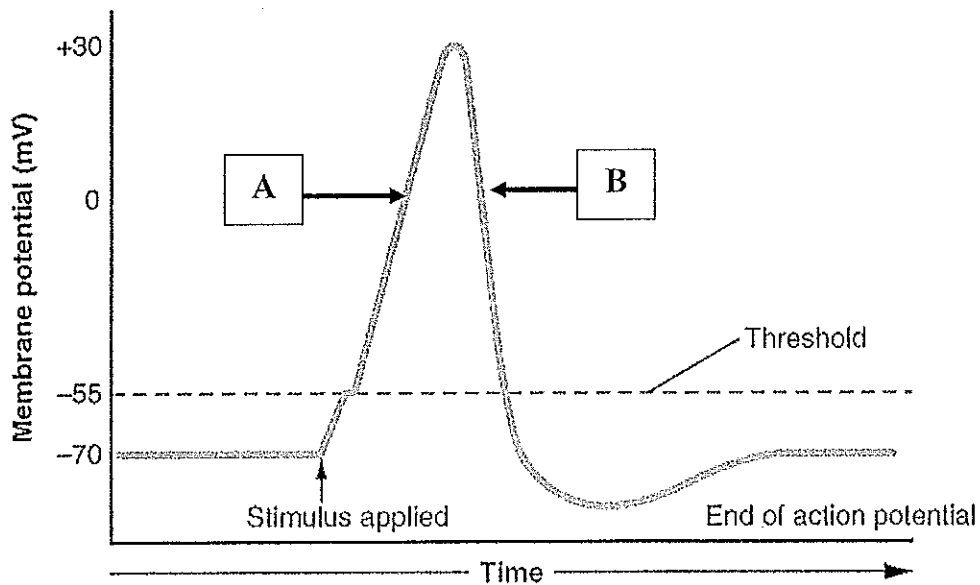
(40 marks)

Write answers in the space provided.

1. a) Name the related organelle/substance/structure of the cell which matches with its function. (5 marks)

- i. An organelle which contains the DNA of the cell is
- ii. The organelle which contains enzymes involved in cellular respiration is
.....
- iii. A semiliquid substance which surrounds the cellular organelles is
- iv. An organelle which is the site of protein synthesis is
- v. A fluid filled sac that contains digestive enzymes is

b) Following graph shows the different phases of the action potential of a neuron.



i. Identify the phases A and B. (2 marks)

A -

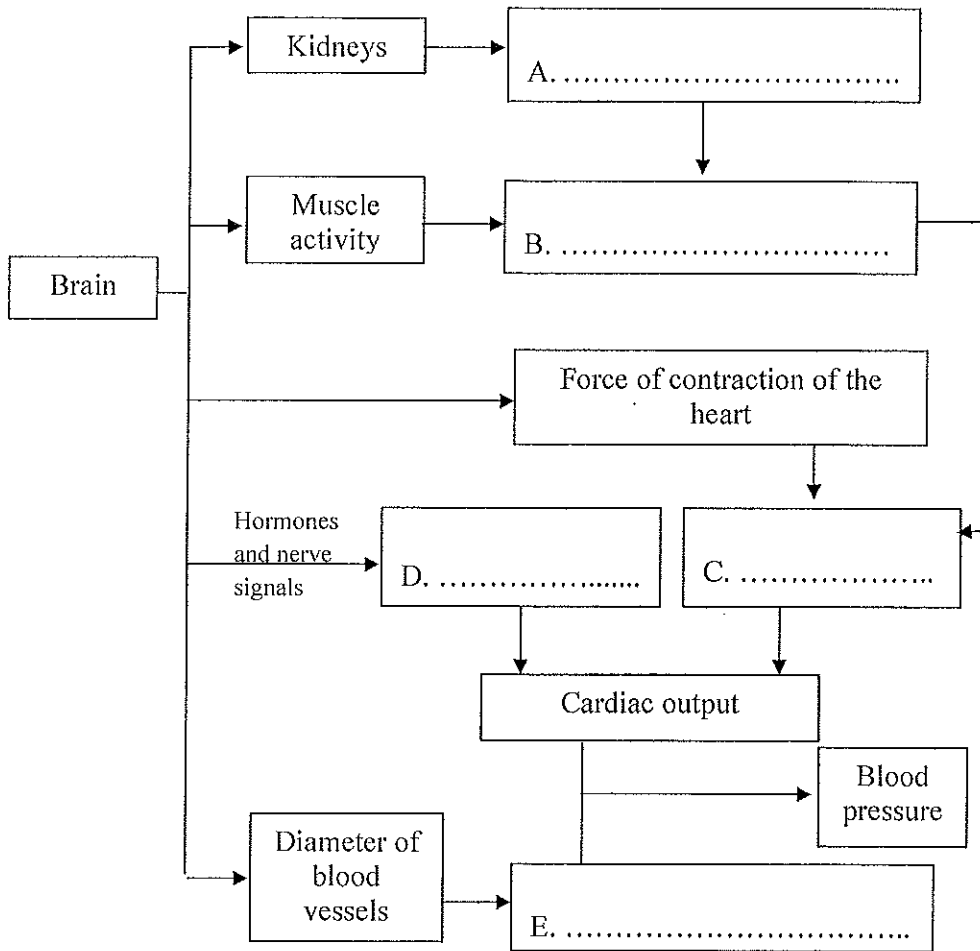
B -

ii. Name the main event that occurs during the phase A and B. (4 marks)

A -

B -

c) Following flow chart shows the factors influencing the blood pressure. Identify the factors A, B, C, D and E. (5 marks)



d) List two (02) examples of passive immunity. (4 marks)

i.

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ii.

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2. a) Briefly describe the mechanism of inspiration.

(10 marks)

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b) What is neuromuscular junction?

(2 marks)

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c) Compare four (04) features of skeletal and smooth muscle fibres.

(8 marks)

Skeletal Muscle	Smooth Muscle
i.	
ii.	
iii.	
iv.	

Part C – Essay Questions*(40 marks)*

Answer all questions.**Write answers in the books provided.**

1. Outline the physiological basis of following.
 - a) Blindness in vitamin A deficiency. (10 marks)
 - b) Appearance of first heart sound. (10 marks)

2. a) Briefly describe the structure of the immunoglobulin molecule. (5 marks)
b) Explain the statement 'Secretion of the gastric juice is under hormonal and neural control'. (15 marks)