UNIVERSITY EXAMINATIONS

UNIVERSITEITSEKSAMENS

UNISA university of south africa

BMI3702

May/June 2018

Biomedical Techniques

Duration 2 Hours

100 Marks

EXAMINATION PANEL AS APPOINTED BY THE DEPARTMENT

Closed book examination

This examination question paper remains the property of the University of South Africa and may not be removed from the examination venue

This paper consists of THREE (3) pages

ANSWER **ALL** QUESTIONS

Students must answer the questions in the examination answer book provided.

All the best!

[TURN OVER]

QUESTION 1

Describe the functions of each of the following

1 1 SDS-PAGE

1 2 Nylon membrane

1 3 Electroblotting

1 4 Primary antibody

1 5 Conjugate enzyme

(5x2=**10]**

QUESTION 2

A laboratory assistant was required to prepare 80% glacial acetic acid solution The assistant created a small space on an already overcrowded laboratory bench and poured 800 ml of acetic acid into a measuring cylinder The fumes of the acetic acid overcame the assistant, burnt his eyes and his throat To protect himself he tried to move quickly and in so doing knocked the measuring cylinder over onto himself and the bench, burning his hands, his feet and his legs in the process At this stage, you enter the laboratory

2 1 As the first person to arrive on the scene what action would you take to assist the injured laboratory assistant? (10)

2 2 How could the accident have been avoided? (5)

2 2 What protective clothing was supposed to be worn by the laboratory assistant in order to protect himself? (5)

[20]

QUESTION 3

3 1 List five (5) factors affecting fixation of the cells in a physical and chemical state (5)

3 2 Describe the steps involved in the processing of surgical specimens for a histopathological examination (5)

3 3 Explain how would one apply PCR technique to detect infectious agents in a diagnostic laboratory (10)

3 4 Explain functions of ethidium bromide during electrophoresis (5)

[25]

QUESTION 4

Discuss in detail the theory and applications of enzyme-linked immunosorbent assay (ELISA)

[10]

QUESTION 5

5 1 Discuss how the use of a dense medium can facilitate the separation of particles by centrifugation As part of the answer, be sure to identify the two major types of density gradient centrifugation and the basis of separation in each case (10)

5 2 Briefly describe the conditions under which centrifugation is carried with respect to the particles being separated in each of the two types (5)

[15]

QUESTION 6

You are trying to purify an Interesting Protein (IP) with the help of ion-exchange chromatography After the purification step you analyse the fractions by SDS-PAGE and Western Blotting The Antibody identifies a protein of 22 kDa as IP, but in the SDS gel you see that the fraction also contains three contaminating proteins with molecular masses 6 kDa, 28 kDa, and 60 kDa How would you continue to purify your protein using chromatography? Discuss the advantages and disadvantages of the possible techniques

[20]

TOTAL: 100 Marks

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