Tutorial Letter 101/3/2018

BIOMEDICAL TECHNIQUES

BMI3702

Semesters 1 and 2

Department of Life and Consumer Sciences

This tutorial letter contains important information about your module.

BARCODE

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Dear Student

1 INTRODUCTION

Welcome to the biomedical sciences and particularly haematology! I hope that you will have an enjoyable and fruitful academic year. This module is offered in the Department of Life and Consumer Sciences and your lecturer for this module is **Mr MC Monyama**. I would like to take this opportunity to wish you success with your academic year.

I would also like to encourage you to register on myUnisa. Please check this site regularly for updates, posted announcements and additional resources uploaded throughout the semester. Rapid communications throughout the semester(s) have been made possible through myUnisa. You can use the myUnisa site to submit assignments and we strongly recommend that you submit your assignment online as this will ensure that you receive rapid feedback and comments, access your official study material, have access to the Unisa Library functions, 'chat' to your lecturers or to fellow students and participate in online discussion forums and obtain access to all manner of learning resources.

If at any stage while you are studying you have any questions or require assistance with problems, we are available to assist you. Our contact details are listed in section 3: Lecturer(s) and contact details in this tutorial letter.

Tutorial matter may include the following:
Tutorial Letters 101 and 201

Some of this tutorial material may not be available when you register. If this is the case, this tutorial material will be posted to you as soon as possible. Please note that tutorial matter is also available on myUnisa. PLEASE read the instructions in this tutorial letter carefully and prepare Assignments 01 and 02 ONLY for the semester for which you are REGISTERED. Once you have completed and submitted the assignments you can use the questions in the other assignments as practice or in preparation for the exam. It is very important that your first assignment reaches Unisa on or before the due date. Students who have not submitted this assignment by the due date will not be allowed to write the examination.

2 PURPOSE AND OUTCOMES

2.1 Purpose

Qualifying students are able to know, understand and apply principles and theory relating to pathology particularly as these pertain to systems pathology. The purpose of this module is to enable you, the individual learner, to identify and apply practices, processes and principles of pathology to solve problems in health and disease.

2.2 Outcomes

The student should be able to:

- Discuss the basic laboratory procedures and safety procedures to be followed in a research laboratory

- Describe the principles of immunochemical techniques so that the use of antibody-antisera reactions in diagnosing medical conditions is made clear.

- Discuss the principles of centrifugation as another way of separating molecules by size.
- Discuss the fundamental principles and types of chromatography in support of separating certain molecules from a mixture of molecules

- Describe the principles and types of electrophoresis so that molecules could be separated.

- Describe some of the basic concepts in histopathology so that the role of histopathology in diagnosing diseases is elucidated.

3 LECTURER(S) AND CONTACT DETAILS

3.1 Lecturer(s)

Lecturer: Mr. MC Monyama
Telephone number: +27 11 471 2230 (during office hours 8:00 – 16:00)
Email address: monyamc@unisa.ac.za

Postal address:
The Lecturer
Department of Life and Consumer Sciences
Private Bag x6
Florida
1710

NOTE: You may enclose more than one letter in an envelope, but do not address enquiries to different departments (e.g. Despatch and Library Services) in the same letter. This will cause a delay in the replies to your enquiries. Please write a separate letter to each department and mark each letter clearly for the attention of that department. **Letters to lecturers may not be enclosed together with assignments**. Always write your **student number and the module code** at the top of your letter.

3.2 Department

The Department of Life and Consumer Sciences is located in the Calabash Building, Unisa Science Campus, Roodepoort, Johannesburg. The Departmental telephone number is +2711 471 2230/2292 and the Departmental fax number is +2711 471 2796.

3.3 University

Should you need to contact the university about matters not related to the content of this module, consult the publication *Study@ unisa* , which you received with your study material. This brochure contains information on how to contact the university (e.g. to whom you can write for different queries, important telephone and fax numbers, addresses and details of the opening and closing times of particular facilities).

You can also make use of the following contact routes:
Unisa website http://www.unisa.ac.za & http://mobi.unisa.ac.za
Email (general enquiries) info@unisa.ac.za
International students are urged to make use of the email address info@unisa.ac.za

study-info@unisa.ac.za queries related to application and registration.
assign@unisa.ac.za for assignment enquiries
exams@unisa.ac.za for examination enquiries
despatch@unisa.ac.za for study material enquiries
finan@unisa.ac.za for student account enquiries
myUnisaHelp@unisa.ac.za for assistance with myUnisa
myLifeHelp@unisa.ac.za for assistance with myLife email accounts
SMS 32695 – South Africa only
You will receive an auto response SMS with the various SMS options. The cost per SMS is R1.00.
Fax 012 429 4150

NOTE: Whenever you contact the university, whether in writing or telephonically, always mention the **module code and your student number**.

myUnisa webpage (Unisa's online campus)
Access to the myUnisa website requires a computer that is linked to the internet (internet access is available to you at provincial libraries, internet cafés and Unisa regional telecentres, see myUnisa for a list of these places in your area). You should also note that some of these centres allow free internet access on presentation of your student card.

Go to: https://my.unisa.ac.za/portal/
For module-specific information, log in and click on:
BMI3702-18-S1 (for semester 1)
OR
BMI3702-18-S2 (for semester 2)
With the aid of myUnisa, you will ultimately be able to use the internet to perform all study-related functions which are now normally done by telephone, regular postal service or personal visits to the campus.

If you have online access, you should do the following to get started with this module:

- Go to myUnisa (http://my.unisa.ac.za)
- Log in with your myUnisa login details. If you are not sure how to do this, consult the publication *Study@ unisa* . You should have received this with your study material. Alternatively, use the link to access the publication.)
- Once logged in, you will see a link to the module code. If this is not at the top of your screen, click on 'More sites' and select it from the drop-down menu.
- Once you are in the site for this module, read the welcome message.
- Now click on **Additional Resources**, then on the subfolder **Tutorial Matter**, and then on **Tutorial Letter 101**. Read this letter carefully.
- Take particular note of the online links listed in **section 4.3, Electronic Reserves (e-Reserves)**.

You will find that this module requires you to use the internet to access information on aspects of biomedical techniques. Please take careful note of details of published articles and online links and the information in the associated online articles. NOTE: you will be required in your assignments to accurately refer to articles that you access online.

4 RESOURCES

4.1 Prescribed books

There are no prescribed textbook for this module.

4.2 Recommended books

There are no specific recommended books for this module.

4.3 Electronic reserves (e-reserves)

There are no e-Reserves for this module. Announcements will be posted on myUnisa as and when required.

4.4 Library services and resources information

For brief information, go to www.unisa.ac.za/brochures/studies

For detailed information, go to http://www.unisa.ac.za/library. For research support and services of personal librarians, click on "Research support".

The library has compiled a number of library guides:

- finding recommended reading in the print collection and e-reserves – http://libguides.unisa.ac.za/request/undergrad
- requesting material – http://libguides.unisa.ac.za/request/request
- postgraduate information services – http://libguides.unisa.ac.za/request/postgrad
- finding, obtaining and using library resources and tools to assist in doing research – http://libguides.unisa.ac.za/Research_Skills
- how to contact the library/finding us on social media/frequently asked questions – http://libguides.unisa.ac.za/ask

5 STUDENT SUPPORT SERVICES

Important information appears in your *Study@ unisa* brochure.

6 STUDY PLAN

Use your *Study@ unisa* brochure for general time management and planning skills.
This is a semester module over 15 weeks and requires 120 hours of study time. This means that you will have to study 8 hours per week for this module. The following is a recommended time schedule which can be used as a guideline for studying this module. Below this time schedule please see an example of a study plan.

ACTIVITY	HOURS
Reading and re-reading study guide	10
Reading relevant chapters in the prescribed textbook	35
Completing study guide activities	10
Studying for and completing the Assignments	20
Studying for examination	40
Final revision	5
TOTAL	**120**

Week	Activity (each week represents 8 hours of study time)
1	Read through your study material (your tutorial letter) and, if you have one, skim through a textbook and identify the relevant chapters in the text. Start accessing articles online. This exercise allows you to gain an overall picture of the module.
2	
3	Read through your textbook, using your study guide, and identify all key areas.
4	
5	
6	Complete and submit Assignment 1. Please allow sufficient time for the assignment to reach Unisa before the due date.
7	Begin with your in-depth study of the initial study units.
8	Please prepare study notes whilst reading and learning the material.
9	Start to complete your Assignment 2
10	Complete and submit Assignment 2. Depending on how you will submit the completed assignment, please note that you should allow sufficient time for the assignment to reach Unisa before the due date.
11	
12	Begin with your in-depth study of later study units. Please prepare study notes while reading and learning the material.
13	
14	
15	Revision and preparation for the exam.

7 PRACTICAL WORK AND WORK-INTEGRATED LEARNING

There are no practicals for this module.

8 ASSESSMENT

8.1 Assessment criteria

8.2 Assessment plan

Summary as to how your final mark will be calculated

Formative assessment:

Assignment 01 (10% of year mark)

Assignment 02 (90% of year mark)

} Year mark (30% of final mark)

Summative assessment:

Examination

} Examination mark (70% of final mark)

} **Final mark**

8.3 Assignment numbers

8.3.1 General assignment numbers

Assignments are numbered consecutively per module, starting from 01.

8.3.2 Unique assignment numbers

Each semester consists of two assignments.

SEMESTER 1
Assignment 01: 605979
Assignment 02: 788936

SEMESTER 2
Assignment 01: 731626
Assignment 02: 864389

8.4 Assignment due dates

SEMESTER 1
Assignment 01: 16th March 2018
Assignment 02: 20th April 2018

SEMESTER 2
Assignment 01: 17th August 2018
Assignment 02: 21st September 2018

8.5 Submission of assignments

Both the assignments are compulsory and must be submitted on or before the stipulated due date. **To receive quicker, online feedback and comments on your assignments submit your assignment electronically.** If you intend to post your assignment, please complete and post it at least **a week** before the due date to ensure that we receive it in time. Please note that FAILURE TO SUBMIT ASSIGNMENT 01 WILL RESULT IN YOUR NOT BEING ALLOWED ADMISSION TO THE EXAMINATION. In exceptional circumstances, only a **valid** medical certificate associated with a valid long-term illness will be considered as a reason for the late

submission of an assignment. In such a case, please notify the lecturer well in advance. Note that if no arrangements were made, the assignment will not be marked. Please attach the medical certificate at the back of your assignment and ensure that you have certified copies of such a certificate.

For detailed information and requirements with regard to assignments, see the brochure entitled *Study@ unisa* , which you received with your tutorial material.
Note: Prepare only the assignments for the semester for which you are registered.

Assignments may not be submitted by fax or email. You may submit written assignments and assignments completed on mark-reading sheets either by regular postal service **or** mobile MCQ submission **or** electronically via myUnisa. Make a copy of your assignment for your own reference and if the original is lost at any stage during the submission process.

Unisa is implementing onscreen marking of assignments to help you receive quicker feedback on your assignments. This will not be the case for all your modules, however, most modules from the Department of Life and Consumer Sciences can be marked in this way.

1. **Submit the PDF document (your assignment) via myUnisa (online).**

For guidance on how to submit an assignment via myUnisa, see section 8.4 of this tutorial letter or the *Study@ unisa* brochure.

8.6 The assignments

Assignments are seen as part of the learning process for this module. As you complete the assignment, study the textbook, consult other resources, discuss the work with fellow students or tutors or do research - you are actively engaged in learning. Looking at the assessment criteria (e.g. the action words and the mark allocation) given for each assignment will help you to understand what is required of you more clearly.

There are TWO assignments for this module for each semester. You will find the assignments for:

Semester 01 (January to June) in **Appendix A,** and
Semester 02 (July to December) in **Appendix B** of this tutorial letter.

The **due dates** are given with each assignment in Appendix A and B.

The **first** assignment of each of your courses is **compulsory**. You will qualify for **examination admission** for a course only if you submit the first assignment by the due date. If more than one assignment is set for a course, all the assignments for that course will be taken into consideration when calculating your year mark. Thus, to ensure a good year mark that contributes to improving your final mark, submit all your assignments in time.

8.7 Other assessment methods

Not applicable

8.8 The examination

Use your *Study@ unisa* brochure for general examination guidelines and examination preparation guidelines.

This module is offered in a semester period of fifteen weeks. This means that if you are registered for the first semester, you will write the examination in May/June 2018 and the

supplementary examination will be written in October/ November 2018. If you are registered for the second semester you will write the examination in October/November 2018 and the supplementary examination will be written in May/June 2019.

For examination admission it is compulsory for you to hand in the first assignment for this module. It is also to your own advantage to do the assignments in order to test your understanding of the subject, and to establish how well prepared you are for the examination. You need to obtain a minimum of 40% in your examination to be able to pass. If you do not obtain at least 40% in the exams, you will fail even if the combination of year and exam mark is more than 50%. You will also need a minimum of 40% in the examination to obtain admission to a supplementary examination.

You require a final mark of 50% to pass this module. Please see the examples below:

- Exam mark below 40% will result in your failing this module.

- Exam mark 40% and Year mark 50% (combination of your first and second assignment marks) = A final mark of 43% - you will be allowed to write a supplementary exam.
  Calculated as:
  40 x 70% (0.70) = 28%
  50 x 30% (0.30) = 15%

- Exam mark 50% and Year mark 60% = A final mark of 53% - you will pass this module
  Calculated as:
  50 x 70% (0.70) = 35%
  60 x 30% (0.30) = 18%

As you can see from these examples it is important to obtain a minimum of 40% for your exam, as well as submitting both your assignments and work hard to obtain a good year mark to ensure that you pass the module.

You will have the opportunity to give an account of your studies in a two-hour examination paper (per module). You will be informed by letter of the dates, places and venues of the examinations. Examination guidelines, posted on myUnisa will give you pointers as to how to prepare for the examination. Revision should be done thoroughly before the examination. Contact us immediately, preferably by direct email, if you encounter any problems. Students can also refer to the *Study@ unisa* brochure for general examination guidelines and examination preparation guidelines. The examination paper is a two (2) hour examination and consists of questions such as those requiring you to provide definitions of terms, draw labelled diagrams as well as answering short and longer essay questions.

You will be informed later by letter of the dates, places and venues of the two-hour examination required per module. Exam guidelines, posted on myUnisa will give you pointers on how to prepare for the examination. Revision should be completed before the examination and you should contact us immediately by email if you encounter any problems. Students can also refer to the *Study@ unisa* brochure for general examination guidelines and examination preparation guidelines.

9 FREQUENTLY ASKED QUESTIONS

The *Study@ unisa* brochure contains an A-Z guide of the most relevant study information.

10 SOURCES CONSULTED

Not applicable.

11 IN CLOSING

Not applicable

12 ADDENDUM

Appendix A – Assignments for the first semester
Appendix B – Assignments for the second semester

Plagiarism
It is incumbent of all of us to behave ethically and so I would seriously remind you of a major problem regarding unethical behavior in education, namely plagiarism.

Plagiarism is the act of taking words, ideas and thoughts of others and passing them off as your own. It is a form of theft which involves a number of dishonest academic activities. The *Disciplinary code for students* (2004) is given to all students at registration. You are advised to study the *Code*, especially sections 2.1.13 and 2.1.4 (2004:3-4). Also read the University's Policy *on (Copyright infringement and plagiarism*).

Avoiding Plagiarism

We cannot place enough emphasis on the seriousness of plagiarism. Please do not plagiarise – it is a form of THEFT. If plagiarism is detected, lecturers cannot determine if the student has learnt the subject material and so it is very difficult to assign a mark. In this case, the assessor must ask the question: "Who is being assessed, the student who prepared the assignment or the author of the plagiarised text?

Ideally, the student should understand and learn the subject matter and write an assignment answer on this material in his/her own words. If, for whatever reason, this is difficult for the student to achieve, we recommend that the student answer the question by:

- Writing down subject material from the text
- Remembering to place this quote within inverted commas
- Ending the quote by supplying a correct reference of the author of this quoted material
- providing a few personal sentences that indicate that the student has reflected on this material.

Note: This latter reflection indicates that the student has read, understood and can place the answer in an academic, personal, social, research. etc context.

APPENDIX A: FIRST SEMESTER COMPULSORY ASSIGNMENTS

Department of Life and Consumer Sciences

Biomedical Techniques– BMI3702

Semester code: 01

Assignment 01

Due Date: 16th March 2018

Unique assignment number: 605979

INSTRUCTIONS

1) Use the mark-reading sheet provided to answer these questions.

2) Fill in all your **personal details** on the mark-reading sheet.

3) Indicate the correct answer clearly by shading in the appropriate number on the mark- reading sheet with an HB pencil.

4) If more than one number is shaded in any answer, NO marks will be awarded for that question.

Multiple-choice questions 2 × 10 = **[20]**

The purpose of this assignment is to familiarise yourself with the study material content by means of techniques designed to improve your study skills. Take note that you will have to consult your textbook as well as the study guide to answer Assignment 01. After reading the sections in your study guide, answer the questions below.

1. What is the principle of gel electrophoresis?

    1. Movement of charged particles under the influence of an electric field.
    2. To separate palindromic sequences.
    3. Movement of particles under the influence of weight.
    4. Attachments of particles to the membrane.
    5. Expression of the viral genome.

2. The following are features of laboratory safety, except..... .

    1. laboratory coats.
    2. cigarettes.
    3. gloves.
    4. SOPs.
    5. glasses.

3. *Taq* polymerase enzyme

    1. Expresses DNA
    2. Cuts the DNA
    3. Labels the DNA
    4. Deletes RNA strands
    5. Synthesizes new strands of a DNA

4. What is used in the gel tank when running an agarose gel?
    1. 10x TAE
    2. 1x TBE
    3. 5x TBE
    4. 1x TAE
    5. 15xTAE
5. Which cells fight foreign organisms in the body?
    1. Skin cells
    2. Sleeper cells
    3. Red blood cells
    4. White blood cells
    5. Green blood cells
6. The following are associated with genetic diseases, except ……. .
    1. point mutations.
    2. virus infection.
    3. expression of virus genome.
    4. satellite DNA.
    5. carcinogens.
7. ……is an instrument that can be used to measure the concentration of the extracted DNA.
    1. Photometer
    2. ELISA
    3. Chromatograph
    4. Spectrophotometer
    5. Flow cytometer

8. Biosafety cabinets must be cleaned with 70% EtOH, DNaway and then the UV light should be switched on before and after use……..

    1. Only once a week cleaned with DNase away
    2. Only once a month cleaned with DNase away
    3. Twice a week cleaned with DNase away
    4. After every minute cleaned with DNase away
    5. Everyday

9. Glassware and reagents are autoclaved at ……

    1. 150°C for 20 min at 5 bar above atmospheric pressure.
    2. 170 °C for 20 min at 5 bar above atmospheric pressure.
    3. 121°C for 15 min at 1 bar above atmospheric pressure.
    4. 150°C for 15 min at 1 bar above atmospheric pressure.
    5. 121°C for 15 min at 5 bar above atmospheric pressure.

10. The following are associated with flow cytometry, except….. .

    1. $CaCl_2$.
    2. gating.
    3. sheath fluid.
    4. detectors.
    5. cell sorting.

END OF ASSIGNMENT 1

Department of Life and Consumer Sciences

Biomedical Techniques– BMI3702

Semester code: 01

Assignment 02

Due Date: 20th April 2018

Unique assignment number: 788936

INSTRUCTIONS

1) Type your assignment on a computer. You may print on ordinary white paper and not necessarily the Unisa typing paper provided. Please use 1,5 spacing and Arial or a similar font of 11 or 12 pitch. Leave a line open between questions. If you are not able to type your assignment on a computer, use a black or blue pen and please write neatly.

2) If you want to submit a hard copy of this assignment, use the assignment cover and envelope provided. When stapling your answers inside the cover, staple only in the top left-hand corner.

3) Your student number is the number just below your address. This number must be filled in on the assignment cover and must also be quoted in all correspondence with the university

4) Answer all questions as briefly and clearly as possible in your own words.

5) Number your answers correctly**.**

QUESTION 1

Describe in detail, the various sections and protocols that should be included in the safety file of a modern biomedical science laboratory.

[20]

QUESTION 2

Define each of the following items in terms of their use in western blotting

2.1 SDS-PAGE

2.2 Nylon membrane

2.3 Electroblotting

2.4 Primary antibody

2.5 Conjugate enzyme

[2x5=10]

QUESTION 3

Explain the differences between a spectrophotometer that uses a phototube for a detector and one that uses a photodiode array detector.

[10]

QUESTION 4

Describe how one would design a centrifugation experiment to isolate sediments containing cell nuclei.

[10]

QUESTION 5

As a biomedical scientist, you were given a task to design a plan for isolating and purifying an enzyme that catalyses the hydrolysis of the methyl esters of aromatic amino acids. Assume that your last step of purification is to be affinity chromatography, describe an affinity sorbent that might be effective in purifying the protein.

[15]

QUESTION 6

Discuss the clinical applications of Immunofixation.

[10]

TOTAL MARKS = 75

APPENDIX B: SECOND SEMESTER COMPULSORY ASSIGNMENTS

Department of Life and Consumer Sciences

Biomedical Techniques– BMI3702

Semester code: 02

Assignment 01

Due Date: 17th August 2018

Unique assignment number: 731626

INSTRUCTIONS

1) Use the mark-reading sheet provided to answer these questions.

2) Fill in all your **personal details** on the mark-reading sheet.

3) Indicate the correct answer clearly by shading in the appropriate number on the mark-reading sheet with an HB pencil.

4) If more than one number is shaded in any answer, NO marks will be awarded for that question.

Multiple-choice questions 2 × 10 = **[20]**

The purpose of this assignment is to familiarise yourself with the study material content by means of techniques designed to improve your study skills. Take note that you will have to consult your textbook as well as the study guide to answer Assignment 01. After reading the sections in your study guide, answer the questions below.

1. The following are features of laboratory safety, except..... .
    1. laboratory coats
    2. cigarettes
    3. gloves
    4. SOPs
    5. glasses
2. The following are associated with diagnostics, except…… .
    1. Gram stain.
    2. chromatography.
    3. flow cytometry.
    4. Ziehl-Neelsen.
    5. ELISA.
3. The following are associated with DNA isolation, except…… .
    1. gel diffusion.
    2. detergent.
    3. NaOH.
    4. phenol-chloroform.
    5. proteolytic enzyme.

4. The following are associated with the restriction enzyme EcoR1, except…… .
    1. palindromic sequences.
    2. staggered ends.
    3. 5’ – GATATC – 3’.
    4. DNA cutting.
    5. buffer.
5. The following are associated with genetic diseases, except ……. .
    1. point mutations.
    2. virus infection.
    3. expression of virus genome.
    4. satellite DNA.
    5. carcinogens.
6. The following are associated with the real time polymerase chain reaction, except ……. .:
    1. polymerase.
    2. buffer and $MgCl_2$.
    3. labelled primers/probe.
    4. stringency.
    5. transparent reaction.
7. The following are associated with RFLP analysis, except ……. .
    1. gel destaining.
    2. DNA smear.
    3. gel staining.
    4. DNA fragments.
    5. agarose gel electrophoresis.

8. The following are associated with bacterial culture, except ……. .

    1. lipid enzyme.
    2. growth media.
    3. antibiotics.
    4. axenic culture.
    5. shaking incubator.

9. The following are associated with both Southern and western blotting, except….. .

    1. attachment to membranes
    2. transfer buffer
    3. transfer of macromolecules
    4. hybridization of labeled molecule
    5. stringency washes

10. The following are associated with flow cytometry, except….. .

    1. $CaCl_2$
    2. gating
    3. sheath fluid
    4. detectors
    5. cell sorting

End of assignment 1

Department of Life and Consumer Sciences

Biomedical Techniques– BMI3702

Semester code: 02

Assignment 02

Due Date: 21St September 2018

Unique assignment number: 864389

INSTRUCTIONS

1) Type your assignment on a computer. You may print on ordinary white paper and not necessarily the Unisa typing paper provided. Please use 1,5 spacing and Arial or a similar font of 11 or 12 pitch. Leave a line open between questions. If you are not able to type your assignment on a computer, use a black or blue pen and please write neatly.

2) If you want to submit a hard copy of this assignment, use the assignment cover and envelope provided. When stapling your answers inside the cover, staple only in the top left-hand corner.

3) Your student number is the number just below your address. This number must be filled in on the assignment cover and must also be quoted in all correspondence with the university.

4) Answer all questions as briefly and clearly as possible in your own words.

5) Number your answers correctly.

QUESTION 1

In isolating eukaryotic DNA it is essential that the DNA is not sheared and that high molecular weight DNA be isolated. Describe in detail the steps involved in eukaryotic DNA isolation and the precautions you would take to prevent shearing of the eukaryotic DNA.

[20]

QUESTION 2

Discuss in detail the theory and applications of southern and western blotting.

[20]

QUESTION 3

Assume that a centrifuge is operating at 43,000 rpm. What is the relative centrifugal force at a distance from the central axis of 6cm?

[5]

QUESTION 4

Explain the purpose of each of the chemical reagents that are used for PAGE.

a) Acrylamide

b) TEMED

c) Coomasie blue dye

d) Bromophenol blue

e) Sodium dodecyl sulfate

[2x5=10]

QUESTION 5

5.1 Why can you not use a glass cuvette for absorbance measurement in

the UV spectral ranges. (5)

5.2 Why must a cuvette with four translucent sides be used for flouresence? (5)

[10]

QUESTION 6

Describe the basis for separating proteins by using the following:

a) Ion exchange chromatography

b) Affinity chromatography

c) Gel filtration chromatography

d) Gas chromatography

e) Size-exclusion chromatography

[2x5=10]

TOTAL MARKS =75