



PAST PAPERS

<i>Faculty</i>	<i>Department / Section/Division</i>
<i>Not Applicable</i>	<i>Learning Resource Centre</i>

Past Papers

Faculty of Health Sciences

Higher diploma in Biomedical Sciences

(Year 2 – Semester II)

<i>Document Control & Approving Authority</i>	<i>Senior Director – Quality Management & Administration</i>
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<i>1st Issue Date: 2017.011.30</i>	<i>Revision No.00</i>	<i>Revision Date: 19.04.2023</i>	<i>Validated by: Librarian</i>
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Faculty of Health Sciences
Higher Diploma in Biomedical Science
HD 2233 – Biostatistics and Bioinformatics
2nd year 2nd semester – Batch 1
Assignment

INDEX NUMBER:

.....

Date : 23th December 2022
Time : 1:30 p.m. to 2:30 p.m.

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **ONE** question.
- Answer **ALL** questions.
- You should write answers in lined papers legibly in black or blue ink.
- You are not allowed to take out the examination papers.

Question 01

(100 Marks)

The figure mentioned below are the output from the biological databases.

A.

```

Escherichia coli O25b:H4 chromosome, complete genome
GenBank: CP015085.1
FASTA  Graphics
LOCUS      CP015085                5289898 bp   DNA    circular BCT 15-JUN-2016
DEFINITION Escherichia coli O25b:H4 chromosome, complete sequence.
ACCESSION  CP015085
VERSION    CP015085.1
DBLINK     BioProject: PRJNA316859
           BioSample: SAMN04605558
KEYWORDS   .
SOURCE     Escherichia coli O25b:H4
ORGANISM   Escherichia coli O25b:H4
           Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
           Enterobacteriaceae; Escherichia.
  
```

B.

```

ID  A00145; SV 1; linear; unassigned RNA; PAT; MAM; 678 BP.
XX
AC  A00145;
XX
DT  22-MAR-1993 (Rel. 35, Created)
DT  14-APR-2005 (Rel. 83, Last updated, Version 3)
XX
DE  B.taurus BoIFN-alpha A mRNA
XX
KW  interferon alpha.
XX
OS  Bos taurus (cattle)
OC  Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia;
OC  Eutheria; Laurasiatheria; Cetartiodactyla; Ruminantia; Pecora; Bovidae;
OC  Bovinae; Bos.
XX
RN  [1]
RP  1-678
RA  ;
RT  ;
RL  Patent number GB2157697-A/1, 30-OCT-1985.
XX
  
```

1.1. Mention the common features of the above-mentioned flat file output. (40 marks)

1.2. State the database which would provide the following result.

A-.....

B-.....

(10 marks)

1.3. Explain the steps of Sanger Sequencing.

(50 marks)



Faculty of Health Sciences
HIGHER DIPLOMA IN BIOMEDICAL SCIENCES
HD2233
Pathology of Diseases
2nd year 2nd Semester
End Semester SEQ Examination

INDEX NUMBER:

Date : 22nd of December 2022
Time : 9.00 a.m. – 12.00 p.m. (Three hours)

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **SIX** questions.
- Answer **ALL** questions.
- You should write legibly in black or blue ink.
- You are not allowed to take out the examination papers.

Question 1

- 1.1 Name 4 types of Cystic Diseases of the Kidneys (100 marks)
(20 marks)
- 1.2 Write a short note on Chronic Kidney Disease (30 marks)
- 1.3 List the clinical signs and symptoms of Eclampsia (20 marks)
- 1.4 Define the following disease conditions.
- 1.4.1 Vaginal candidiasis (15 marks)
- 1.4.2 Hypospadias (15 marks)

Question 2

- 2.1 Write short Notes of the followings (100 marks)
- 2.1.1 Talipes Equinovarus (clubbed foot) (25 marks)
- 2.1.2 Gout (25 marks)
- 2.1.3 Cushing's disease (25 marks)
- 2.1.4 Grave's disease (25 marks)

Question 3

- Write short notes on followings. (100 marks)
- 3.1 Hypertrophy (25 marks)
- 3.2 Hyperplasia (25 marks)
- 3.3 Atrophy (25 marks)
- 3.4 Metaplasia (25 marks)

Question 4

- 4.1 List cardinal signs of inflammation. (100 marks)
- 4.2 Compare followings. (10 marks)
- 4.2.1 acute inflammation and chronic inflammation (30 marks)
- 4.2.2 Dry gangrene and wet gangrene. (30 marks)
- 4.2.3 Regeneration & Repair. (30 marks)

Question 5

- Briefly describe the followings. (100 marks)
- 5.1 Giant cells in chronic inflammation (25 marks)
- 5.2 Coagulative necrosis (25 marks)
- 5.3 Caseous necrosis (25 marks)
- 5.4 Apoptosis (25 marks)

Question 6

- 6.1 Briefly describe the pathological changes in following stages of lobar pneumonia. (100 marks)
- 6.1.1 Congestion (20 marks)
- 6.1.2 Red Hepatisation (20 marks)
- 6.1.3 Gray Hepatisation. (20 marks)
- 6.1.4 Stage of Resolution (20 marks)
- 6.2 Briefly describe on emphysema (20 marks)



Faculty of Health Sciences
Higher Diploma in Biomedical Science
Fundamentals of Laboratory Management
HD2213
2nd year 2nd semester –Batch 01
End Semester Examination- SEQ Examination
Duration 2 hrs

INDEX NUMBER:

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Date : 19.12.2022
Time : 09.00 am – 11.00 am (2 hours)

INSTRUCTIONS TO CANDIDATES

- This question paper consists of FOUR questions.
- Answer ALL questions.
- You should write legibly in black or blue ink
- You are not allowed to take out the examination papers.

Question 01**(100 marks)**

- 1.1 State three types of laboratories (15 marks)
- 1.2 State five topics that are contained in a standard operating procedure. (25 marks)
- 1.3 State four types of laboratory waste. (20 marks)
- 1.4 State two methods of disposal of laboratory waste. (20 marks)
- 1.5 State two things that should be considered when designing a laboratory. (20 marks)

Question 02**(100 marks)**

2.1 Ferric ions forms a stable complex with thiocyanate to give absorbance value as 0.0354 at 480 nm.

$$(\epsilon - 0.177 \text{ mol}^{-1}\text{dm}^3\text{cm}^{-1} \text{ and } l = 1 \text{ cm})$$

- i. By using the given equation find the concentration of the complex (mol dm^{-3})

$$A = \epsilon C l$$

- ii. The student has decided to dilute the above sample to 0.02 mol dm^{-3} . Calculate the dilution factor for the experiment.

(50 marks)

2.2 An accredited laboratory follows external quality control programme (EQC) for Thyroxine (T4) assay by using electrochemiluminescence method. The laboratory reported the final value as 100 ng/dl. EQC result for the same peer group is given as a range of 0.05-0.2 $\mu\text{g/dl}$. Comment the accuracy of the laboratory result. (50 marks)

Question 03**(100 marks)**

3.1 State the managerial duties and responsibilities of below positions.

- 3.1.1 Director (5 marks)
- 3.1.2 Administrator (5 marks)
- 3.1.3 Manager (5 marks)
- 3.1.4 Supervisor (5 marks)

3.2 Describe the four basic elements in management. (20 marks)

- 3.3 State the leadership skills which are required at different managerial levels. (20 marks)
- 3.4 Describe the administration model via using an illustration. (40 marks)

Question 04**(100 marks)**

- 4.1 What is a Laboratory Information Management System (LIMS)? (10 marks)
- 4.2 State the purposes of LIMS. (10 marks)
- 4.3 Describe different requirements and performance tests for laboratory staff. (30 marks)
- 4.4 How the cost-effective management ensured within a clinical laboratory? (20 marks)
- 4.5 Draw a Microbiology Laboratory floor plan and by referring to your plan state how to prevent contamination and provide protection to the laboratory worker. (30 marks)

Library.

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Faculty of Health Sciences
Higher Diploma in Biomedical Sciences
HD 2233 – Pathology of Diseases
Batch – 01
2nd Year 2nd Semester
End semester OSPE Examination

INDEX NUMBER:

Date : 22nd of December 2022
Time : 1.30 p.m. – 2.30 p.m. (1 hour)

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **Twenty OSPE** questions.
- Answer **ALL** questions.
- You should write legibly in black or blue ink.
- You are not allowed to take out the examination papers.

Question 01

1.1

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1.2

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Question 02

2.1

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2.2

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Question 03

3.1

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3.2

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Question 04

4.1

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4.2

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Question 05

5.1.....

5.2.....

5.3.....

Question 06

6.1.

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6.2.

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Question 07

7.1.

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7.2.

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Question 08

8.1.....

8.2.....

8.3.....

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Question 09

9.1.

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9.2.

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Question 10

10.1.

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Question 11

11.1.

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11.2.

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Question 12

12.1.

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12.2.

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Question 13

13.1.

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13.2.

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Question 14

14.1.

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14.2.

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Question 15

15.1.

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15.2.

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Question 16

16.1.

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16.2.

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Question 17

17.1.

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Question 18

18.1.

.....

Question 19

19.1.

.....

19.2.

.....

Question 20

20.1.

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20.2.

.....



Faculty of Health Sciences
Higher Diploma in Biomedical Science
Fundamentals of Laboratory Management
HD2213

2nd year 2nd semester –Batch 01

Repeat End Semester Examination- SEQ Examination

Duration 2 hrs

INDEX NUMBER:

.....

Date : 13.02.2023
Time : 09.00 am – 11.00 am (2 hours)

INSTRUCTIONS TO CANDIDATES

- This question paper consists of FOUR questions.
- Answer ALL questions.
- You should write legibly in black or blue ink
- You are not allowed to take out the examination papers.

Question 01	(100 marks)
1.1 State three types of laboratories	(15 marks)
1.2 State five topics that are contained in a standard operating procedure.	(25 marks)
1.3 State four types of laboratory waste.	(20 marks)
1.4 Briefly describe two methods of disposing of laboratory chemical waste.	(20 marks)
1.5 State two things that should be considered when considering the safety of a laboratory.	(20 marks)

Question 02 (100 marks)

- 2.1 How many grams of Sodium chloride (NaCl) should you use to make 37 ml of a
1.0 moldm⁻³ solution? (Na – 23 g/mol, Cl - 35.5 g/mol) (20 marks)
- 2.2 How do you make a 1:300 dilution of a bacillus spore sample? (20 marks)
- 2.3 Find the dilution factor if 2.5 ml of a stock solution is combined with 7.5 ml of water. (20 marks)
- 2.4 How would you prepare 3% (W/V) NaCl solution in 100ml of water
(w/v = weight (of a solute) per final solution volume) (20 marks)
- 2.5 A rainwater sample has a H⁺ concentration of 1×10^{-5} . Find the pH of the rainwater.
pH = $-\log ([H^+])$ (20 marks)

Question 03 (100 marks)

- 3.1 Define record retention (10 marks)
- 3.2 What are the elements of a patient order form for a test? (20 marks)
- 3.3 Describe 3 components of analytical phase to monitor for ensuring the reliability of results. (30 marks)
- 3.4 State the features of Standard Operating Procedures. (10 marks)
- 3.5 Describe the patient's rights which covered by Patient's Bill of Rights. (30 marks)

Question 04 (100 marks)

- 4.1 What is a Laboratory Information Management System (LIMS)? (10 marks)
- 4.2 State the advantages of LIMS within a clinical laboratory. (10 marks)
- 4.3 Describe different sections of laboratory report of a test. (30 marks)
- 4.4 Mention the cost-effective measures which taken by clinical laboratory management. (20 marks)
- 4.5 Draw a Microbiology Laboratory floor plan and by referring to your plan state how to prevent contamination and provide protection to the laboratory worker. (30 marks)

Library

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Faculty of Health Sciences
HIGHER DIPLOMA IN BIOMEDICAL SCIENCES
HD2233
Pathology of Diseases
2nd year 2nd Semester
End Semester SEQ Examination-Resit

INDEX NUMBER:

Date : 15 of February 2023
Time : 9.00 a.m. – 12.00 p.m. (Three hours)

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **SIX** questions.
- Answer **ALL** questions.
- You should write legibly in black or blue ink.
- You are not allowed to take out the examination papers.

Question 1

- 1.1 Name 4 types of Cystic Diseases of the Kidneys (20 marks)
1.2 Write a short note on Chronic Kidney Disease (30 marks)
1.3 List the clinical signs and symptoms of Eclampsia (20 marks)
1.4 Define the following disease conditions.
1.4.1 Vaginal candidiasis (15 marks)
1.4.2 Hypospadias (15 marks)

Question 2

- 2.1 Write short Notes of the followings (100 marks)
2.1.1 Talipes Equinovarus (clubbed foot) (25 marks)
2.1.2 Gout (25 marks)
2.1.3 Cushing's disease (25 marks)
2.1.4 Grave's disease (25 marks)

Question 3

- Briefly describe the followings. (100 marks)
3.1 Giant cells in chronic inflammation (25 marks)
3.2 Coagulative necrosis (25 marks)
3.3 Caseous necrosis (25 marks)
3.4 Apoptosis (25 marks)

Question 4

- 4.1 Briefly describe the pathological changes in following stages of lobar pneumonia. (100 marks)
4.1.1 Congestion (20 marks)
4.1.2 Red Hepatisation (20 marks)
4.1.3 Gray Hepatisation. (20 marks)
4.1.4 Stage of Resolution (20 marks)
4.2 Briefly describe on emphysema (20 marks)

Question 5

- 5.1 List cardinal signs of inflammation. (100 marks)
5.2 Compare followings. (10 marks)
5.2.1 acute inflammation and chronic inflammation (30 marks)
5.2.2 Dry gangrene and wet gangrene. (30 marks)
5.2.3 Regeneration & Repair. (30 marks)

Question 6

- Write short notes on followings. (100 marks)
6.1 Hypertrophy (25 marks)
6.2 Hyperplasia (25 marks)
6.3 Atrophy (25 marks)
6.4 Metaplasia (25 marks)



Faculty of Health Sciences
Higher Diploma in Biomedical Science

HD 2233 – Biostatistics and Bioinformatics
2nd year 2nd semester – Batch 1
End Semester SEQ Examination- Repeat

Date : 16th February 2023
Time : 9.00 a.m. to 12.00 p.m.

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **SIX** questions.
 - Answer **ALL** questions.
 - You should write answers in lined papers legibly in black or blue ink.
-

Question 01 **(100 Marks)**

A biomedical scientist wanted to identify the bacteria species in a water sample taken from a pond. Therefore, he plated the water samples taken from different sampling sites on Nutrient Agar. After 24 hours of incubation, the number of Colony Forming Units (CFU)/ mL, that he observed are as follows:

7, 16, 120, 51, 102, 81, 8, 16, 9, 11, 16, 24, 53, 76, 12

- 1.1. Find the mean, mode, median of this data. (30 marks)
- 1.2. Calculate the variance and standard deviation. (50 marks)
- 1.3. State the characteristic features of a normal distribution. (20 marks)

Question 02 **(100 Marks)**

- 2.1. What is “Statistics”? (10 marks)
- 2.2. Compare the data types of discrete and continuous data with an example for each. (20 marks)
- 2.3. Order the following data types according to their statistical importance.
Nominal, ordinal, ratio and interval (10 marks)
- 2.4. List the one for each of the above-mentioned data types. (60 marks)

Question 03**(100 Marks)**

Assume that a research student wanted to find out whether the current crisis in Sri Lanka has significantly influenced on malnourishment of the children younger than 6 years. He sampled 20 children from a selected MOH area and the weight data observed were as follows.

10, 18, 8, 12, 11, 17, 12, 15, 13, 9, 10, 14, 12, 9, 9, 14, 16, 12, 15, 11

A statistical analysis performed has analyzed the following for the data set.

Median= 12; Mode=12; Variance= 8.134; Skewness=0.24

- 3.1. Calculate the mean and standard deviation. (20 marks)
- 3.2. Estimate the population mean with 95% confidence Intervals. (30 marks)
- 3.3. What percentage of data values are actually within ± 1 and within ± 2 standard deviation of the mean. (50 marks)

Question 04**(100 Marks)**

- 4.1. List five characteristics of a good hypothesis. (20 marks)
- 4.2. Mention the importance of null hypothesis on research. (20 marks)
- 4.3. Differentiate the independent and dependent variable and provide the example for each type. (60 marks)

Question 05**(100 Marks)**

A school is assessing the performance of the advanced level students based on the term end results for the subjects of IT, Management and Statistics. The instructor has noticed that the students who are having higher assignment marks in Statistics are more likely to perform well in other two subjects.

The instructor requires to check whether that there is an effect from the assignment marks of statistics to the term end results. The ANOVA table of the statistical analysis is mentioned below.

Source	SS	df	MS	F
Between	1500	2	?	?
Within	3211	22	?	
Total	5342	24		

- 5.1. Find the values of Mean Square (MS). (40 marks)
- 5.2. Calculate the F value. (20 marks)
- 5.3. Mention the critical value at the significance level of 0.05. (20 marks)
- 5.4. State the conclusion and the decision of the test. (20 marks)

Question 06**(100 Marks)**

- 6.1. What are the components of the Bioinformatics? (10 marks)
- 6.2. Mention three nucleotide sequence databases available on the internet. (20 marks)
- 6.3. Write the information appear in the NCBI FASTA format. (30 marks)
- 6.4. List two protein databases and database mining tools. (40 marks)

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Faculty of Health Sciences
Higher Diploma in Biomedical Science

HD 2233 – Biostatistics and Bioinformatics

2nd year 2nd semester – Batch 1

Assignment (Repeat)

Date : 16th February 2023
Time : 1:30 p.m. to 2:30 p.m.

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **TWO** questions.
 - Answer **ALL** questions.
 - You should write answers in lined papers legibly in black or blue ink.
-

Question 01

(100 Marks)

The figure mentioned below are the output from the biological databases.

A.

Penicillium chrysogenum Wisconsin 54-1255 complete genome, contig Pc00c22

[FASTA](#) [Graphics](#)

LOCUS AM920437 6387817 bp DNA linear PLN 27-FEB-2015

DEFINITION *Penicillium chrysogenum* Wisconsin 54-1255 complete genome, contig Pc00c22.

ACCESSION AM920437

VERSION AM920437.1

DBLINK BioProject: [PRJEA27927](#)
BioSample: [SAMEA2272345](#)

KEYWORDS .

SOURCE *Penicillium rubens* Wisconsin 54-1255
ORGANISM [Penicillium rubens Wisconsin 54-1255](#)
Eukaryota; Fungi; Dikarya; Ascomycota; Pezizomycotina;
Eurotiomycetes; Eurotiomycetidae; Eurotiales; Aspergillaceae;
Penicillium; *Penicillium chrysogenum* species complex.

REFERENCE 1 (bases 1586311 to 1588650)

AUTHORS Gouka,R.J., van Hartingsveldt,W., Bovenberg,R.A., van Zeijl,C.M., van den Hondel,C.A. and van Gorcom,R.F.

TITLE Development of a new transformant selection system for *Penicillium chrysogenum*: isolation and characterization of the *P. chrysogenum* acetyl-coenzyme A synthetase gene (*facA*) and its use as a homologous selection marker

B.

```

ID   A00145; SV 1; linear; unassigned RNA; PAT; MAM; 678 BP.
XX
AC   A00145;
XX
DT   22-MAR-1993 (Rel. 35, Created)
DT   14-APR-2005 (Rel. 83, Last updated, Version 3)
XX
DE   B.taurus BoIFN-alpha A mRNA
XX
KW   interferon alpha.
XX
OS   Bos taurus (cattle)
OC   Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia;
OC   Eutheria; Laurasiatheria; Cetartiodactyla; Ruminantia; Pecora; Bovidae;
OC   Bovinae; Bos.
XX
RN   [1]
RP   1-678
RA   ;
RT   ;
RL   Patent number GB2157697-A/1, 30-OCT-1985.
XX

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1.1.State the type of database. (20 marks)

1.2. Mention the example of the databases which would provide the following result.

A-.....

B-..... (80 marks)

Question 02

(100 marks)

Mention the information that you could retrieve and the main components of the following FASTA output.

Aspergillus niger supercontig An01

GenBank: AM270980.1

[GenBank](#) [Graphics](#)

```

>AM270980.1 Aspergillus niger supercontig An01
GATCATACAAATCATCCCCTTGGCCTCTGTTAGCCTTCTGCGATCTATCGTGCTCGGAGCAGCTGCAAGC
CCCGCAAGTGACAATCCGAAACGGACTCAATAAGATTTGGCGTTGTCGACTTCATTTTCAGTTCCGCGCA
CCTTCCAGCTGCAGCTATCGACTGTGCAAGCCGACCCTCCACGAGTCAAACAGATTGGAAACGATAATAA
ACCGATCTCCGAGATAAGAATGGCGCTTTGGTCAAACATGAAGGCGTGAGTGAACACTCTGCTGACTTC
ATGTAAGTGAGGAGAATATCGCTAAATGTGATACGGACATGACATTAGACTTGCAACAGAAAGAATAATA
CATGCAGGTCCGAGATGAACAACGAGACAAACCTTGTGTGGTGCTCAACATAGTTTGTAAATAGAAACGT
GATTGACCGTCACATGGCTCCTTGACTGTCTAGATACATCCGGCTGATCATACTTTGTTCTAGTGTATCC
ATGACGGAGAAAAGTGCATTTATGATTTTATGATCGATCTGTTGAATGCCAATAGGCACTGCGGGCTGG
CCGGCGAAATTTGAAAGGAGCAGGTAGCACTCAACATCAGAGGTGTAACAACCCAGCGAACCCATTCAACG
TTGGAGTCATTTATTGTTTATCTCCGCTCTAGTTTCAGTTTCCTCTCGCGACTTGCTTTGTATCTGA
GTAAGCACCCGATAATAAAGTAGTTGTCATCACTGGCTTGAAAAATCAAACAATTACTCGCATCTCGCGA
GAAAGAACAGACTGCTCGTAACAAGCAAGCAAACGCCAAGCTCTTATTCAGATAACATTACTGGATCCCC
TTCTGCTATCTGATTTATTTAGTGACTGGTCCCGGGCCCGAAGCCGCCACCCTGTGCCACCTCATTTTAA
GCGGGAGGTCGTAACGCTCGGGCTCAATTCTCTGTTCAAGAACGCCCTTAAGGCCAATCGACAGCCGCCA
AACAGTGCAGCCTGGATGGCGGTCTGACCAGGGACACTGAGTATAAATGAATCCTGGAGCCGCTATGTA
GGCCACGTCACAAGCCTTATAACCACCTCAAGTTGGACTGGATATCAATGATCCGGATCCAGTCCCTTTGC
TCAACACCCTTAGAACAAATTTATAGTTGTCAAGCAGTGTTCCTGGGTGGCAGTCCCATCGGGGCGATT
GGGTGATGAATACITGGTAAACCCTATCATACTGCTACACCCAGGAGCTTGTGAGACCTGTGGCTTCCAA

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Faculty of Health Sciences
Higher Diploma in Biomedical Sciences
HD 2223 Pharmacology
Batch 01

2nd year 2nd Semester End Repeat Examination SEQ

INDEX NUMBER:

Date : 14th February 2023

Time : 9.00 am – 12.00 pm (Three Hours)

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **SIX** questions.
- Answer **ALL** questions.
- You should write legibly in black or blue ink.
- You are not allowed to take out the examination papers.

Question 01

(100 Marks)

Describe briefly

- 1.1. Drug absorption
- 1.2. Drug metabolism

(50 marks)
(50 marks)

Question 02

(100 Marks)

- 2.1. List the types of drug interactions
- 2.2. Describe the importance of drug interactions
- 2.3. Describe the pharmacovigilance

(30 marks)
(30 marks)
(40 marks)

Question 03

(100 Marks)

Describe

- 3.1. Agonist
- 3.2. Antagonist

(50 marks)
(50 marks)

Question 04

(100 Marks)

- 4.1. What is ADME?
- 4.2. How drugs are distributed in the body?
- 4.3. What is volume of distribution?

(40 marks)
(30 marks)
(30 marks)

Question 05

(100 Marks)

- 5. Describe the drug treatment in
 - 5.1. Liver impairment
 - 5.2. Renal impairment

(50 marks)
(50 marks)

Question 06

(100 Marks)

Briefly describe drug administration in

- 6.1. Elderly patients
- 6.2. Children
- 6.3. Pregnancy

(40 marks)
(30 marks)
(30 marks)