FACULTY OF SCIENCE

DEPARTMENT OF BIOTECHNOLOGY AND FOOD TECHNOLOGY

ADVANCED DIPLOMA IN BIOTECHNOLOGY

MODULE   BTN7X01

APPLIED DISEASE AND IMMUNE RESPONSE

CAMPUS   **DFC**

MAIN SUMMATIVE ASSESSMENT NOVEMBER 2020

AVAILABLE DATE: 12/10/2020   DUE DATE: 12/11/2020

ASSESSOR(S):   DR K KONDIAH

EXTERNAL MODERATOR: PROF AN TRAORE-HOFFMAN

MARKS: 65 (+5 BONUS)

NUMBER OF PAGES: 3

INSTRUCTIONS TO STUDENTS:

1. **COMPLETE THE ACADEMIC INTEGRITY STATEMENT BELOW WITH THIS ASSESMENT.**
2. **THERE ARE FIVE COMPULSORY QUESTIONS AND ONE BONUS QUESTION.**
3. **SUBMIT THE ASSESSMENT ONLINE VIA BLACKBOARD.**
4. **WHERE QUESTIONS REQUIRE THE INCLUSION OF REFERENCES, THIS HAS BEEN INDICATED.**
5. **LABEL YOUR FILE AS FOLLOWS: FINAL ASSESSMENT_STUDENT NUMBER.**
6. **SUBMIT A TURN IT IN PLAGIARISM REPORT WITH LESS THAN 20% SIMILARITY. THIS SHOULD ONLY INCLUDE THE QUESTIONS REQUIRING REFERENCES.**
7. **GOOD LUCK!**

Academic Integrity Statement

I, _____, certify on my honor as a student of the University of Johannesburg that I have neither received nor given aid on this assessment.

I have read and understood 'Policies and Plagiarism Declaration' available in UJ Blackboard. I agree to be academically honest and will not cheat, lie or steal to influence the accurate assessment of my work and understand that there will be consequences should there be suspicions and evidence of my dishonestly.

The assessment I submit is entirely my own work under strict examination conditions.

Signed by: _____

Student Number: _____

Date: _____

Use the information provided in the table below to guide your review of relevant literature on COVID-19.

COVID-19 Vaccine Developer/Manufacturer	Type of Candidate Vaccine	Number of Doses	Timing of Doses	Route of Administration
University of Oxford/AstraZeneca	ChAdOx1-S	1		IM
CanSino Biological Inc./Beijing Institute of Biotechnology	Adenovirus Type 5 vector	1		IM
Sinovac	Inactivated	2	0,14 days	IM
Moderna/NIAID	LNP-encapsulated mRNA	2	0, 28 days	IM

Q1. Provide a referenced description differentiating between the two vaccine strategies being used by University of Oxford and Moderna. (10 marks)

Q2. Discuss in detail how each of the vaccines from Q1 above function to stimulate an appropriate adaptive immune response to COVID-19 infection. Make sure to explain the immune responses that will be generated. Use references to support your answer.
(25 marks)

Q3. Explain how using adenovirus type 5 vector could affect the efficacy of the CanSino Biological Inc. vaccine candidate. (5 marks)

Q4. The attributes considered for selecting a vaccine candidate include: potential for efficacy, vaccine stability, administration of the vaccine, safety of the vaccine and vaccine availability. Describe each attribute and explain the criteria used to assess them. (15 marks)

Q5. Consider that you are a scientist evaluating a vaccine candidate. Use the table below to determine the maximum score that you would use to rate each attribute discussed in Q4 according to their importance/priority. The total score must add up to 100 points. Attributes can be scored higher, less or equally to each other. Write a brief reason for why you have assigned a higher/lower/equal score to an attribute. (10 marks)

Vaccine attribute	Maximum possible score	Reason for score
Efficacy		
Safety		
Stability		
Administration		
Availability		
Total Score	**100**	

Bonus Question:

Discuss the possible risk(s) associated with the vaccine strategy used by Sinovac. (5 marks)