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CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences

Bachelor of Science Honours in Biomedical Sciences

Human Genetics – BMS 3224

3rd Year 2nd Semester -End Examination SEQ -Batch 05

Date	:	**06.06.2024**
Time	:	**9. 00 A.M – 12.00 P.M (3 HOURS)**

INSTRUCTIONS TO CANDIDATES

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

QUESTION 01 **(100 Marks)**

1.1 Define the term of Allele. (10 marks)

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1.2 Mention the special types of chromosomes present in the animals. (20 marks)

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1.3 Compare and contrast the structure of Euchromatin and Heterochromatin. (30 marks)

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1.4 Draw and explain the structure of human chromosome. (40 marks)

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QUESTION 02 **(100 Marks)**

2.1 Define the terms of phenotype and genotype. (20 marks)

2.2 Mention the importance of using garden pea, ***Pisum sativum*** as a model organism for the mendelian studies. (20 marks)

2.3 What are the three Mendelian laws? (25 marks)

2.4 Differentiate the concepts of codominance and incomplete dominance with an example using the Punnett squares. (35 marks)

QUESTION 03 **(100 Marks)**

3.1 State the Hardy-Weinberg formula with its components. (20 marks)

3.2 What are the assumptions and conditions that are applied for the Hardy-Weinberg equilibrium? (30 marks)

3.3 A population genetic study had identified a human population which is having a percentage of the homozygous recessive genotype (aa) of 36%.

Using that 36% value, calculate the following frequencies;

A. The frequency of the "aa" genotype. (20 marks)

B. The frequency of the "a" allele. (20 marks)

C. The frequency of the "A" allele. (10 marks)

QUESTION 04 **(100 Marks)**

4.1 State four common non-invasive prenatal testing methods. (20 marks)

4.2 Briefly explain the benefits of utilizing invasive prenatal tests over the non-invasive prenatal tests. (20 marks)

4.3 Write short notes on following topics. (60 marks)

4.3.1. List the importance of genetic counselling. (20 marks)

4.3.2. State the effect of chromosomal translocation on oncogenetics. (20 marks)

4.3.3. What is the mechanism of chromosomal crossing over? (20 marks)

QUESTION 05 **(100 Marks)**

5.1 Define SNP. (20 marks)

5.2 Outline why SNP is in clinically significant. (25 marks)

5.3 What is the importance of CYP enzyme system ? (25 marks)

5.4 Warfarin metabolism vary from person to person and can change the therapeutic efficacy drug. Describe your answer taking CYP2C9 and warfarin as examples. (30 marks)

QUESTION 06 **(100 marks)**

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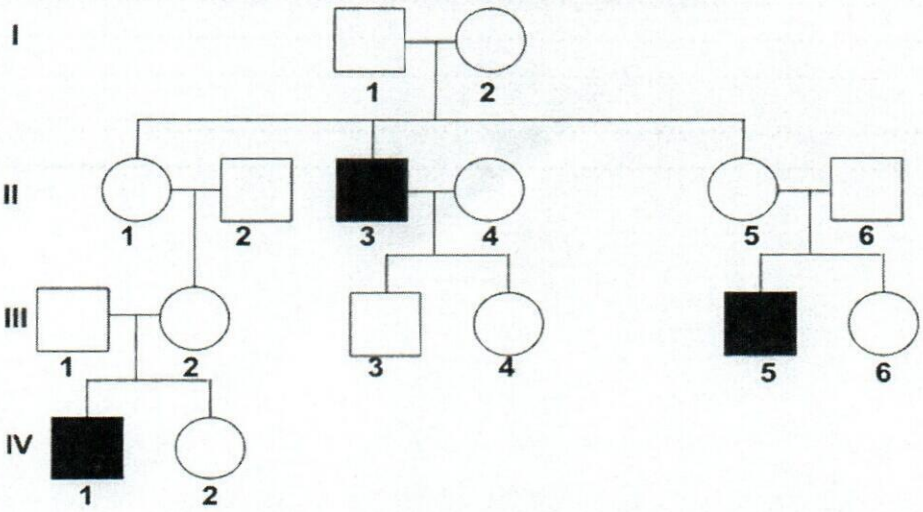
Answer the following questions referring to the given pedigree chart.



6.1. Identify the above pedigree type and provide reasons for your answer. (30 marks)

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6.2. State two (02) diseases with the above inheritance pattern. (10 marks)

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6.3. Mention the genotypes of the affected individuals. (15 marks)

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6.4. What is the probability of the 4^{th} and 5^{th} individuals of generation III having a child with the trait? (25 marks)

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6.5. Identify the carrier females in the above pedigree chart. (20 marks)

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Library.

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Faculty of Health Sciences
Bachelor of Science Honours in Biomedical Sciences
BMS 3233 Transfusion Science

Batch – 05
3rd Year 2nd Semester
End Semester SEQ Examination

Date : **04.06.2024**
Time : **9.00am. – 11.00m. (Two Hours)**

INSTRUCTIONS TO CANDIDATES

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

Question 01 **(100 Marks)**

1.1 What is meant by Transfusion transmitted infections? (25 marks)

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1.2 What is febrile non haemolytic transfusion reactions? (25 marks)

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1.3 What is transfusion Related Acute Lung Injury (TRALI) (25 marks)

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1.4 What is acute haemolytic transfusion reaction? (25 marks)

Question 02 **(100 Marks)**

2.1 State the steps of coombs' reagent preparation in laboratory. (25 marks)

2.2 What is the principle of a coombs test? (25 marks)

2.3 Differentiate the process of complete and incomplete agglutination reactions. (25 marks)

2.4 What is the principle of direct and indirect coombs' test? (25 marks)

Question 03 **(100 Marks)**

3.1 What is the process of separation of whole blood components in a blood bank laboratory? (25 marks)

3.2 Differentiate a triple blood bag and quad blood bag. (25 marks)

3.3 Differentiate an autologous, homologous and heterologous blood transfusions. (25 marks)

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3.4 List the two methods used for the process of leukoreduction. (25 marks)

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Question 04 **(100 Marks)**

A 55-year-old female donor presented at a blood donation center. This is her third time donating blood; she had her previous whole blood donation 30 days ago. Furthermore, she is 60 kg, in good health at the time, declared she is free of pregnancy, and had received blood due to a surgery 3 years ago.

4.1 Mention the importance of appropriate donor blood selection. (25 marks)

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4.2 State the criteria that considered when selecting a blood donor and mention the donor eligibility for blood donation of above patient. (25 marks)

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4.3 State the purposes of collection of donor information and pre-donation counselling.

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4.4 What is phlebotomy? (25 marks)

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CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences

Bachelor of Science Honours in Biomedical Science

BMS 3253 Human Nutrition

3rd Year 2nd Semester

End Semester SEQ Examination

5th Batch

INDEX NUMBER: .....

Date	**: 5th June 2024**
Time	**: 9.00 a.m. – 11.00 a.m. (Two hours)**

INSTRUCTIONS TO CANDIDATES

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

Question 1 **(100 marks)**

Sunil is a farmer who is living in a rural area and he has bone fracture in his left femur due to an accident since last week. Doctor asked him to bed rest. Hence he is sleeping for 12 hours per day and rest of the day he is staying on chair with helping his wife who is making some handcrafts. Answer all the questions using the given equation. Give all answers to two decimal places.

Details:

Patient Name	: Mr. Sunil Perera
Age of the patient	: 50 years old
Height	: 5 feet and 2 inches
Weight	: 55 kg

Male Basal Energy Expenditure (BEE) cal/day = 66.47 + 13.7 (weight in kg) + 5 (height in cm) – 6.76 (age in years)

Female BEE cal/day = 655.09 + 9.56 (weight in kg) + 1.85 (height in cm) – 4.68(age in years)

1 foot= 30 cm

1 inch = 2.54 cm

Activity Factor	Activity Level	Activity Level Definition
1.2	Sedentary	Little or no exercise
1.375	Lightly active	Light exercise or sports 1-3 days per week
1.55	Moderately active	Moderate exercise or sports 3-5 days a week
1.725	Very active	Hard exercise or sports 6-7 days a week
1.9	Extremely active	Hard daily exercise or sports and physical job

1.1 Define the term "Body Mass Index' (BMI). (15 marks)

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1.2 Find the body mass index (BMI) of the Mr. Sunil (20 marks)

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1.3 Name the nutrition state of him depending on BMI value. (10 marks)

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1.4 Define the term "Basal Energy Expenditure". (15 marks)

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1.5 Calculate the basal energy expenditure (BEE) by using a Harris Benedict Equation. (20 marks)

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1.6 Calculate the total energy expenditure by considering activity factor. (20 marks)

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Question 2 **(100 marks)**

2.1 List five (05) importance of good nutrition during pregnancy. (25 marks)

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2.2 Write two steps a pregnant woman can take through diet or dietary habits to overcome each of following complications during pregnancy.

2.2.1 Constipation (10 marks)

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2.2.2 Heartburn (10 marks)

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2.2.3 Nausea (10 marks)

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2.3 Briefly indicate five importance of dietary fibres. (25 marks)

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2.4 What is the role of a dietitian? (20 marks)

Question 3 **(100 marks)**

3.1 Kamani is a 12 years old child with total energy expenditure 1800 kcal/day. The percentage values for her macronutrients intake as follows.

Carbohydrate - 60%
Fat - 25%
Protein - 15%

3.1.1 Calculate the gram amount of carbohydrate she needs to eat per day. (20 marks)

3.1.2 Calculate the gram amount of lipids she needs to eat per day. (20 marks)

3.1.3 Calculate the gram amount of proteins she needs to eat per day. (20 marks)

3.2 Define following terms with one example.

3.2.1 Complete proteins (20 marks)

3.2.2 Complementary proteins (20 marks)

Question 4 (100 marks)

4.1 What is a therapeutic diet? (15 marks)

4.2 List the changes should be done in the diet of chronic kidney disease patient. (15 marks)

4.3 List three (03) tips to decrease sodium intake. (15 marks)

4.4 List five (05) functions of essential fatty acids. (15 marks)

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4.5 Define following terms.

4.5.1 Stunting (10 marks)

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4.5.2 Wasting (10 marks)

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4.6 What is Kwashiokor? (20 marks)

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