SYLLABUS DISTRIBUTION

2023/2024 TERM 2

GRADE 11

BIOLOGY

7. Transport in plants
8. Transport in mammals
9. Gas exchange
10. Infectious diseases
11. Immunity

CHEMISTRY

Organic chemistry

- An introduction to AS Level organic chemistry
- Formulae, functional groups and the naming of organic compounds
- Characteristic organic reactions
- Shapes of organic molecules; σ and π bonds
- Isomerism: structural and stereoisomerism

14 Hydrocarbons

- Alkanes
- Alkenes

15 Halogen compounds

- Halogenoalkanes

16 Hydroxy compounds

- Alcohols

17 Carbonyl compounds

- Aldehydes and ketones

18 Carboxylic acids and derivatives

- Carboxylic acids
- Esters

19 Nitrogen compounds

- Primary amines
- Nitriles and hydroxynitriles

20 Polymerisation

- Addition polymerisation

21 Organic synthesis

- Organic synthesis

Analysis

22 Analytical techniques

- Infrared spectroscopy
- Mass spectrometry

COMPUTER SCIENCE 9618

4. Processor Fundamentals
   4.2 Assembly Language
   4.3 Bit Manipulation

5. System Software
   5.1 Operating System
6. Security, privacy and data integrity
   6.1 Data Security
   6.2 Data Integrity

7. Ethics and Ownership
   7.1 Ethics and Ownership
9. Algorithm Design and Problem-solving
   9.1 Computational Thinking Skills
   9.2 Algorithms

10. Data Types and structures
    10.1 Data Types and Records
    10.2 Arrays
    10.3 Files
    10.4 Introduction to Abstract Data Types (ADT)

11. Programming
    11.1 Programming Basics
    11.2 Constructs
    11.3 Structured Programming

12. Software Development
    12.1 Program Development Life cycle
    12.2 Program Design
    12.3 Program Testing and maintenance

MATHS

Pure 1

Differentiation

1. Understand the gradient of a curve at a point as the limit of the gradients of a suitable sequence of chords, and use the notations
   $f'(x)$, $f''(x)$, $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ for first and second derivatives; only an informal understanding of the idea of a limit is expected; e.g. includes consideration of the gradient of the chord joining the points with x coordinates 2 and $(2 + h)$ on the curve $y = x^3$;
   formal use of the general method of differentiation from first principles is not required.

2. Use the derivative of x^n (for any rational n), together with constant multiples, sums and differences of functions, and of composite functions using the chain rule, e.g. find $\frac{dy}{dx}$ given $y = \sqrt{2x^3 + 5}$
3. Apply differentiation to gradients, tangents and ormal, increasing and decreasing functions and rates of change; including connected rates of change, e.g. given the rate of increase of the radius of a circle, find the rate of increase of the area for a specific value of one of the variables.
4. Locate stationary points and determine their nature, and use information about stationary points in Sketching graphs; including use of the second derivative for identifying maxima and minima; alternatives may be used in questions where no method is specified; knowledge of points of inflexion is not included.

Integration

1. Understand integration as the reverse process of differentiation, and integrate $(ax + b)^n$ (for any rational n except -1), together with constant multiples, sums and differences, e.g. $\int (2x^3 - 5x + 1)\,dx$, $\int \frac{1}{(2x+3)^2}\,dx$
2. Solve problems involving the evaluation of a constant of integration, e.g. to find the equation of the curve through $(1, -2)$ for which $\frac{dy}{dx} = \sqrt{2x + 1}$
3. Evaluate definite integrals; including simple cases of 'improper' integrals, such as $\int_0^1 x^{-\frac{1}{2}}\,dx$ and $\int_1^{\infty} x^{-2}\,dx$

   Use definite integration to find:
   - The area of a region bounded by a curve and lines parallel to the axes, or between a curve and a line or between two curves
   - A volume of revolution about one of the axes; a volume of revolution may involve a region not bounded by the axis of rotation, e.g. the region between $y = 9 - x^2$ and $y = 5$ rotated about the x-axis.

Statistics

Discrete random variables

1. Draw up a probability distribution table relating to a given situation involving a discrete random variable X, and calculate E(X) and Var(X).
2. Use formulae for probabilities for the binomial and geometric distributions, and recognise practical situations where these distributions are suitable models, including the notations B(n, p) and Geo(p) ; Geo(p) denotes the distribution in which pr = p(1 – p)r–1 for r = 1, 2, 3, …
3. Use formulae for the expectation and variance of the binomial distribution and for the expectation of the geometric distribution; proofs of formulae are not required.

The normal distribution

1. Understand the use of a normal distribution to model a continuous random variable, and use normal distribution tables; sketches of normal curves to illustrate distributions or probabilities may be required.
2. Solve problems concerning a variable X, where $X \sim N(\mu,\sigma^2)$ including:
   a. finding the value of P(X > x1), or a related probability, given the values of x1, μ, σ

b. finding a relationship between x1, μ, and σ given the value of $P(X > x1)$ or a related probability for calculations involving standardisation, full details of the working should be shown, e.g. $Z = \frac{(X-\mu)}{\sigma}$

3. Recall conditions under which the normal distribution can be used as an approximation to the binomial distribution, and use this approximation, with a continuity correction, in solving problems; n sufficiently large to ensure that both $np > 5$ and $nq > 5$.

PHYSICS 9702

TOPIC # 8 : SUPERPOSITION
8.1 Stationary waves
8.2 Diffraction
8.3 Interference
8.4 Diffraction grating

TOPIC # 9 : ELECTRICITY
9.1 Electric Current
9.2 Potential Difference and Power
9.3 Resistance and Resistivity

TOPIC # 10 : DC CIRCUITS
10.1 Practical Circuits
10.2 Kirchhoff's Laws
10.3 Potential Dividers

TOPIC # 11: PARTICLE PHYSICS
11.1 Atoms, nuclei and Radiation
11.2 Fundamental particles