(2021 Batch onwards)

G 501 DC1.6 Reg. No. : | | | | | | | |

St Aloysius College (Autonomous)

Mangaluru

B.Sc. Semester VI – Degree Examination

April/May - 2026

PHYSICS – VI (a)

ELEMENTS OF CONDENSED MATTER AND NUCLEAR PHYSICS

Time: 2½ hrs. **Max Marks: 60**

SECTION –A

Answer any FOUR of the following. **(4x2=8)**

1. a) Find the Miller indices of a plane that cuts the axes at 3a, 2b, 1c.
   b) State Weidemann–Franz Law.
   c) What are diamagnetic materials? Give two examples.
   d) What are mirror nuclides? Give an example.
   e) State and explain Geiger-Nuttal law.
   f) What is Cherenkov radiation? Why it appears blue in colour.

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SECTION – B

Answer any ONE FULL QUESTION from each unit. **(4x10=40)**

UNIT-I

2.a) Derive an expression for the inter-planar distance in a crystal lattice. **(6)**
   b) Obtain atomic packing factor of a unit cell of BCC lattice **(4)**

3.a) Derive the expression for thermal conductivity in the classical free electron theory. **(6)**
   b) Explain Hall Effect in metals with theory, derivation, and applications. **(4)**

UNIT-II

4.a) Discuss B-H Curve. Hysteresis and Energy loss in a Ferromagnetic Materials. **(6)**
   b) Explain electronic, ionic and orientation polarisation with neat diagram. **(4)**

5.a) Derive an expression for Lorentz Filed in dielectric materials. **(6)**
   b) Distinguish Type-I and Type-II superconductors. **(4)**

UNIT-III

6.a) Derive the expressions for Q-values of β^-, β^+ and electron capture and discuss energy conditions. **(6)**
   b) Discuss specific binding energy curve. **(4)**

7.a) Explain theory of alpha emission. **(6)**
   b) What are radioactive series? Explain different radioactive series. **(4)**

Contd...2

UNIT-IV

8.a) With a neat diagram describe the construction and working of Cyclotron and hence obtain an expression for resonance condition. **(6)**

b) Explain the interaction of electrons with matter. **(4)**

9.a) Describe construction and working of GM counter with necessary diagram. **(6)**

b) Explain photoelectric effect and Compton scattering. **(4)**

SECTION –C

Answer any <u>THREE</u> from the following. **(3x4=12)**

10. Calculate the electrical resistivity of copper if electron density $n=8.5\times10^{28}\ m^{-3}$ and relaxation time $\tau = 2.5\times10^{-14}$ s

11. In a Coolidge tube, an electron strikes the target with a kinetic energy of 30 keV. Determine the maximum frequency of the X-ray emitted.

12. A proton is accelerated by a linear accelerator (linac) in which the particle gains 2 MeV of energy per gap. The accelerator contains 15 accelerating gaps. Calculate the total energy gained by the proton after passing through all the gaps and final velocity of the proton assuming the motion is non-relativistic. (Mass of proton $=1.67\times10^{-27}$ kg)

13. An X-ray photon of wavelength 0.05 nm is scattered by a free electron. After scattering, the wavelength of the photon becomes 0.0512 nm. Calculate the scattering angle of the photon.

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(2021 Batch Onwards)

G 501 DC3.6 Reg. No. : | | | | | | | |

St Aloysius College (Autonomous)

Mangaluru

B.Sc. Semester VI – Degree Examination

April/May - 2026

PHYSICS – VI (b)

ELECTRONIC INSTRUMENTATION AND SENSORS

Time: 2½ hrs. Max Marks: 60

SECTION –A

Answer any FOUR of the following. (4x2=8)

1. a) State the need for a DC power supply in electronic circuits.
   b) What is meant by line voltage phase voltage in a three-phase system?
   c) What is a lead lag circuit? Draw its circuit diagram.
   d) Define resolution of a DAC. What is the value of 1 LSB in DAC?
   e) Define duty cycle and frequency in PWM.
   f) What is the difference between a sensor and an actuator?

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SECTION – B

Answer any ONE FULL QUESTION from each unit. (4x10=40)

UNIT-I

2.a) Explain the construction of an AC alternator with a neat diagram. Describe the function of stator and rotor and power generation. (6)

b) Explain AC power and its characteristics. Differentiate between single-phase and three-phase supply with neat explanation. (4)

3.a) With neat labelled diagram explain the construction and working of a CRT used in CRO. (6)

b) Describe different types of filters used in rectifier circuits. Explain capacitor, inductor, and π-section filters with their functions. (4)

UNIT-II

4.a) Explain the Wien bridge oscillator with circuit diagram. Describe its frequency of oscillation and condition for sustained oscillations. (6)

b) State the Barkhausen criterion for sustained oscillations. Describe triangular and sawtooth wave generators. Explain their circuits and output waveforms. (4)

5.a) Derive the expression for the cut-off frequency of RC high-pass filters. Explain the significance of cut-off frequency in filter operation. (6)

b) Explain active filters using op-amps. Compare them with passive filters in terms of performance and advantages. (4)

Contd...2

UNIT-III

6.a) Explain the working of a 2-bit R–2R ladder DAC with a neat diagram. Also write the output voltage table for all possible digital inputs. **(6)**

b) State the advantages of Flash ADC and explain its limitations in practical applications. **(4)**

7.a) Explain the structure and working of an LCD display with a neat diagram. **(6)**

b) Describe the applications of PWM in control systems and power electronics. **(4)**

UNIT-IV

8.a) Derive the expression for gauge factor of a strain gauge using wire of length L, area A and resistivity ρ. **(6)**

b) Explain the static and dynamic characteristics of transducers. **(4)**

9.a) With a neat, labelled diagram explain the working of LVDT. **(6)**

b) Explain the classification of transducers with suitable examples. **(4)**

SECTION –C

Answer any <u>THREE</u> from the following. **(3x4=12)**

10. A balanced three-phase load is connected to a 400 V supply and draws a line current of 10 A at a power factor of 0.8 lagging; due to line impedance, the voltage at the load drops by 5%, and power losses in the line are 200 W. Calculate the total power supplied by the source, power consumed by the load, and efficiency of the system.
11. An IC voltage regulator maintains a nominal output of 5 V when the input varies from 8 V to 12 V; however, due to load and line variations, the output voltage changes from 5 V to 4.9 V. Calculate the percentage line regulation.
12. Find the resolution of a 4-bit Binary Weighted DAC with a reference voltage of 8V. Calculate the full-scale output voltage.
13. A strain gauge of resistance 350Ω has a gauge factor of 2.1. If it undergoes a strain of 400 μstrain, calculate the change in resistance. Determine the resistance after strain is applied.

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(2021 batch onwards)

G 502 DC1.6 Reg. No.: | | | | | | | |

St Aloysius College (Autonomous)
Mangaluru
B.Sc. Semester VI – Degree Examination
April/May - 2026
CHEMISTRY- VI (a)
Inorganic and Physical Chemistry - IV

Time: 2½ hrs. Max Marks: 60

Instructions: 1. Write the question number and subdivision clearly.
2. Write equations and diagrams wherever necessary.
3. Answer Part – A in first two pages of the answer book.

PART - A

Answer all the following questions. (1×8=8)

1.a) How is the overall formation constant of a metal complex related to stepwise stability constants?

b) Write one biological importance of Ca^{2+} ion.

c) Calculate the multiplicity of d^1 system.

d) How does paramagnetic susceptibility vary with temperature?

e) Define eutectic point.

f) State Raoult's law.

g) Write the chain initiation step of pyrolysis of acetaldehyde.

h) What are the major products produced during radiolysis of methane?

PART- B

Answer any EIGHT of the following questions. (3×8=24)

2.(i) Discuss any three factors affecting the oxygen binding in hemoglobin.

(ii) Explain Guoy's method of determination of magnetic susceptibility of a complex.

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(iii) Write a note on ferromagnetic substances.

(iv) Draw an Orgel diagram of d^1 system.

(v) How can the trans effect be utilized in the selective synthesis of cis isomer of $[Pt(NH_3)_2Cl_2]$?

(vi) How does furnace atmosphere effects the DTA curve?

(vii) What is flow method in kinetics study of fast reactions? Explain.

(viii) Give any three applications of radioisotopes in the industries.

(ix) Explain Pattinson's process of desilverisation of lead.

(x) Draw the phase diagram of phenol water system.

Contd...2

PART - C

Answer any SEVEN of the following questions. (4×7=28)

3. Explain the electronic spectra of $[V(H_2O)_6]^{3+}$.
4. Explain the factors affecting stability of a complex.
5. Explain the spectrophotometric method used to determine the stability constant of $[Fe(NCS)]^{2+}$.
6. Calculate the number of microstates in d^2 and d^4 system.
7. Give any four differences between photochemical and thermochemical reactions.
8. Give the mechanism of radiolysis of water in the presence of gamma radiation.
9. Explain the determination of composition of compound by taking an example of $CaC_2O_4.H_2O$ by thermal analytical technique.
10. Derive phase rule by thermodynamic consideration.
11. Derive the rate equation for the photochemical reaction between H_2 and Cl_2.

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(2021 batch onwards)

G 502 DC3.6 Reg. No.: | | | | | | | |

St Aloysius College (Autonomous)
Mangaluru
B.Sc. Semester VI – Degree Examination
April/May - 2026
CHEMISTRY- VI (b)
Organic Chemistry and Spectroscopy-II

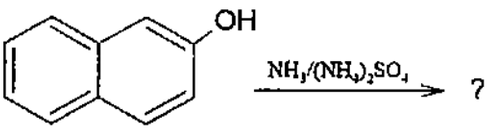
Time: 2½ hrs. **Max Marks: 60**

Instructions: 1. Write the question number and subdivision clearly.
2. Write equations and diagrams wherever necessary.
3. Answer Part – A in first two pages of the answer book.

PART - A

Answer <u>all</u> the following questions. **(1×8=8)**

1.a) Predict the product in the given reaction:



b) What are deficiency diseases of vitamin K?

c) What are ylides?

d) Name the monomer of natural rubber.

e) Define axis of symmetry.

f) State Grothus Draper law.

g) Give the selection rule for EPS spectroscopy.

h) Name the anode and cathode materials used in hollow cathode lamp.

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PART- B

Answer any <u>EIGHT</u> of the following questions. **(3×8=24)**

2.(i) Explain Diazonium coupling reaction.

(ii) Write a note on biological importance of vitamin B_6.

(iii) How does Grignard reagent react with ethyl formate? Give the reaction.

(iv) Give the mechanism for the conversion of amides to primary amines in presence of a base.

(v) Explain synthesis of Nylon 6,6.

(vi) How are tertiary alcohols synthesized from alkyl lithium compounds?

(vii) Deduce the point groups for the following molecules.

a) C_6H_6 b) $CHCl_3$ c) NH_3

(viii) Discuss (a) resonance fluorescence (b) sensitized fluorescence.

(ix) Predict whether the following species are ESR active. Give reason.

(a) Fe^{3+} (b) CO_2 (c) Na (d) O_2 (e) C_6H_6.

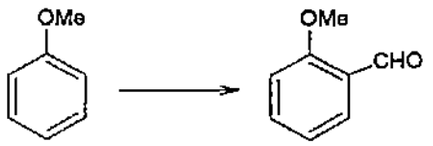
(x) What is ionisation interference? Explain.

Contd...2

PART - C

Answer any SEVEN of the following questions. **(4×7=28)**

3. Define fat soluble vitamins. Give the biological importance of vitamin A.
4. Give the mechanism for the conversion of



5. With mechanism explain formation of hydroxy carboxylic acids from diketones.
6. Discuss mechanism of free radical polymerisation with an example.
7. Explain the reason for the low quantum yield of photochemical combination of hydrogen and bromine.
8. Explain (i) Fluorescence (ii) Phosphorescence (iii) Internal conversion (iv) Inter system crossing using Jablonski diagram.
9. Write the matrix representations for all symmetry elements present in C_{2v} group and give its reducible representation.
10. Explain the photoelectron spectra of (a) H_2 molecule and (b) solid NaN_3.
11. Discuss the instrumentation of atomic absorption spectrometer.

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(2021-2023 batch)

G 503 DC1.6 Reg. No: | | | | | | | |

St Aloysius College (Autonomous)
Mangaluru
B.Sc. Semester VI – Degree Examination
April / May - 2026
MATHEMATICS –VI(a)
Linear Algebra

Time: 2½ hrs. **Max Marks: 60**

PART-A

Answer any SIX of the following: **(6×2=12)**

1. Prove that intersection of 2 subspaces of a vector space V is a subspace of V.
2. For what value of k, will the vector $(1,-2,k)$ in R^3 be a linear combination of vectors $(3,0,-2)$ and $(2,-1,-5)$.
3. Write the matrix of the linear transformation defined by $(1,1) \to (0,1)$ and $(-1,1) \to (3,2)$.
4. If S and T are linear transformations, then prove that their product is also a linear transformation.
5. If λ is an eigenvalue of an invertible transformation T, then show that λ^{-1} is the eigenvalue of T^{-1}.
6. If E_{λ_1} *and* E_{λ_2} are eigen-spaces corresponding to two distinct eigenvalues λ_1 and λ_2 respectively, then prove that $E_{\lambda_1} \cap E_{\lambda_2} = \{0\}$.
7. If a linear transformation T is singular then prove that there exists $\xi \epsilon V$, $\xi \neq 0$ such that $T(\xi) = 0$.
8. Show that $\|\alpha v\| = |\alpha|\|v\|$.

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PART- B

UNIT- I

Answer any TWO of the following : **(2×6=12)**

1. Define Basis. If $v_1, v_2, \dots, v_n$ is a basis of vector space V over a field F and if $w_1, w_2, \dots, w_m$ are linearly independent, then prove that $m \leq n$.
2. (i) Define linear independence. Check whether the vectors $(1,1,0),(3,1,3)$, and $(5,3,3)$ are linearly independent.
   (ii) Show that if $v_1, v_2, \dots, v_n$ are in a vector space V, then either they are linearly independent or some v_k is a linear combination of preceding ones.
3. Let W be a subspace of a finite-dimensional vector space V, then prove that dimension of W should be less than or equal to dimension of V and $dim\left(\frac{V}{W}\right) = \dim(V) - \dim(W)$.

Contd....2

UNIT- II

Answer any TWO of the following: **(2×6=12)**

1. Let $\beta_1, \beta_2, \ldots, \beta_n$ be a basis for a vector space V and $\alpha_1, \alpha_2, \ldots, \alpha_n$ are any vector in W. Then prove that there exists a unique linear transformation $T: V \to W$ such that $T(\beta_i) = \alpha_i$.
2. Prove that the dimension of the domain V is equal to rank +nullity.
3. Show that the transformation $T: R^2 \to R^2$ defined by $T(x, y) = (x + y, x - y, 2x)$ is linear.

UNIT- III

Answer any TWO of the following: **(2×6=12)**

1. i. Define eigenvalues and eigenvectors of a linear transformation. **(2)**
   ii. Let $v_1, v_2, \ldots, v_n$ be eigenvectors of the operator $T: V \to V$ corresponding to the distinct eigenvalues $\lambda_1, \lambda_2, \ldots, \lambda_n$ respectively. Then prove that the set $\{v_1, v_2, \ldots, v_n\}$ is linearly independent. **(4)**
2. Let $T: R^3 \to R^3$ be defined by, $T(x, y, z) = (x - y + 2z,\ y,\ x + 2y + z)$. Find the eigenvalues of T and its corresponding eigenvectors.
3. State and prove the Fundamental Theorem of Homomorphism.

UNIT- IV

Answer any TWO of the following: **(2×6=12)**

1. If V is an $n - dimensional$ vector space over a field F, then prove that V is isomorphic to F^n.
2. State and prove Schwartz's inequality.
3. Let $H: R^3 \to R^3$ be defined by $H(x, y, z) = (x + y - 2z,\ x + 2y + z,\ 2x + 2y - 3z)$.
   a) Show that H is nonsingular
   b) Find a formula for H^{-1}.

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(2021 - 2023 Batch)

G 503 DC3.6 Reg No :

St Aloysius College (Autonomous), Mangaluru
B.Sc. SEMESTER VI - DEGREE EXAMINATION
April/May - 2026
Mathematics - VI(b)
Numerical Analysis

Time : 2 ½ Hours **Max. Marks : 60**

PART - A

Answer any SIX of the following . (6×2=12)

1. Find the interval in which $x^3 - 3x - 5 = 0$ has a real root.
2. Find the absolute and relative error if $\frac{1}{3}$ is approximated as 0.33.
3. If $y = 2^x$ and $h = 1$, find $\Delta^2(2^x)$.
4. Write Newton's forward difference formula for interpolation.
5. If $f(x) = \frac{1}{x}$ then find the divided difference $[a, b, c]$.
6. Write the formula for $\frac{d^2y}{dx^2}$ at $x = x_n$.
7. For $y' = -y$, with $y(0) = 1$, find $y(0.1)$ using Euler's method.
8. Write the Milne's predictor-corrector formula.

PART – B

UNIT – I

Answer any TWO of the following. (2x6=12)

1. Find the root of the equation $2x = cosx + 3$, using the iteration method, with the initial approximation as $\frac{\pi}{2}$.
2. Find the solution for the following simultaneous linear equations using Gauss -Jacobi method:
$10x - 5y - 2z = 3$
$4x - 10y + 3z = -3$
$x + 6y + 10z = -3.$

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3. Find a root of the equation $x^3 - 2x - 5 = 0$, lying between 2 and 3, using Regula Falsi method.

UNIT – II

Answer any TWO of the following. (2x6=12)

1. Find Lagrange's interpolating polynomial of degree 2 approximating the function $y = \ln x$ given by the followlng table. Hence find the value of $\ln(2.7)$.

x	2	2.5	3
$y = \ln x$	0.69135	0.91629	1.09861

2. In the table below, the values of y are consecutive terms of the series of which 21.6 is the 6th term. Find the 1st and 10th term.

x	3	4	5	6	7	8	9
y	2.7	6.4	12.5	21.6	34.3	51.2	72.9

3. The population of a town in the decennial census is given below. Estimate the population for the year 1893.

Year (x)	1891	1901	1911	1921	1931
Population in thousand (y)	46	66	81	93	101

Contd...2

UNIT – III

Answer any TWO of the following. (2x6=12)

1. Evaluate $\int_0^{\frac{\pi}{2}} \cos x dx$ by dividing $[0, \frac{\pi}{2}]$ into 4 subintervals.
2. Derive the general formula for numerical integration and hence obtain Simpson's $\frac{3}{8}$ rule.
3. From the following table of values of x and y, obtain $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ for $x = 1.0$ and $x = 1.2$.

x	1.0	1.2	1.4	1.6	1.8	2.0	2.2
y	2.7183	3.3201	4.0552	4.9530	6.0496	7.3891	9.0250

UNIT – IV

Answer any TWO of the following. (2x6=12)

1. Given $\frac{dy}{dx} = 1 + y^2$, and the values $y(0) = 0$, $y(0.2) = 0.2027$, $y(0.4) = 0.4228$, $y(0.6) = 0.6841$, evaluate $y(0.8)$ using Adams-Bashforth method.
2. Solve by Picard's method: $\frac{dy}{dx} = x + y$; $y(0) = 1$. Hence find approximate values of y(0.1) and y(0.3).
3. Use Euler's modified method to approximate y at $x = 0.2$ and $x = 0.4$, for $\frac{dy}{dx} = \log(x + y)$, with $y(0) = 2$, taking step size $h = 0.2$.

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(2021 Batch onwards)

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St Aloysius College (Autonomous)
Mangaluru
B.Sc. Semester VI – Degree Examination
April/May -2026
ELECTRONICS-VI(a)
TRANSDUCERS, SENSOR NETWORKS, PRINCIPLES OF IOT AND 5G COMMUNICATIONS

Time: 2 ½ hrs. **Max Marks: 60**

Note: This question paper has TWO sections- SECTION A AND SECTION B. Answer both the sections.

SECTION – A

I. Choose the correct answer from the choices given at the end of each question and write the correct answer. **(6x1=6)**

i. A 4-bit DAC with a reference voltage of 8 V has a resolution of_____
a) 0.25 V b) 0.5 V c) 1 V d) 2 V

ii. The resolution of a D/A converter is defined as_____
a) The maximum output voltage
b) The smallest change in analog output for a one-bit change in input
c) The speed of conversion
d) The accuracy of the converter

iii. Which of the following is an example of an active transducer?
a) Thermistor b) Piezoelectric crystal
c) LVDT d) Strain gauge

iv. Which of the following is NOT an application of M2M communication?
a) Smart grids b) Autonomous vehicles
c) Social media networking d) Industrial automation

v. Which of the following is used to capture data from the physical world in IoT devices?
a) Sensors b) Actuators c) Microprocessors d) Microcontrollers

vi. What is the use of the RFID Module?
a) Object Identification b) to provide 3G Connectivity
c) to measure temperature d) to measure Wi-Fi strength

II. Answer any SIX questions: **(6x1=6)**

i. What do you mean by Accuracy of a D to A converter?

ii. Give the fullform of IoT.

iii. Define Resolution of a DAC.

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iv. What is Hybrid P2P networks.

v. List any two advantages of P2P network.

vi. Write full form of PaaS.

vii. What is WSN?

viii. Define Piezoelectric effect.

III. Answer any SIX questions: **(6x2=12)**

i. What is the advantage of R-2R ladder DACs over binary weighted resistors?

ii. Draw the Generic block diagram of an IoT Device.

iii. Briefly explain Strain gauge transducer.

iv. Why do IOT systems have to be self-adapting and self-configuring?

Contd...2

v. Draw the block diagram of RFID security system.

vi. List any 4 applications of IOT in different fields.

vii. Mention different types of RFID.

viii. What is Artificial Intelligence?

SECTION – B

IV. Answer any FOUR questions: **(4x4=16)**

i. With a circuit diagram, explain Binary weighted resistor DAC and hence give the expression for the output voltage.

ii. With necessary diagram explain a capacitive Transducer.

iii. Explain the Characteristics of IoT.

iv. With an example explain Active and passive transducers.

v. What are the IoT enabling technologies used in various IoT-based applications?

vi. Differentiate between RFID and Barcode.

V. Answer any FOUR questions: **(4x5=20)**

i. With a neat circuit diagram explain a Proximity sensor using IC LM358.

ii. With a circuit diagram, explain the working of R-2R ladder network circuit and hence give the expression for the output voltage.

iii. With neat diagram explain architecture of IoT.

iv. How does IoT influence the development of smart cities?

v. With necessary diagram Briefly explain an LVDT.

vi. With a circuit diagram explain a Thermistor as Transducer.

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(2021 Batch onwards)

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St Aloysius College (Autonomous)
Mangaluru
B.Sc. Semester VI – Degree Examination
April/May -2026
ELECTRONICS-VI(b)
C LANGUAGE & SIGNALS AND SYSTEMS

Time: 2 ½ hrs. **Max Marks: 60**

This question paper has Three sections. Section – A, Section – B and Section – C. Answer all sections.

SECTION – A

I. Choose the correct answer from the choices given at the end of each question and write the correct answer. **(6x1=6)**

i. -------statement is used in C language to skip a set of instructions within the loop and go ahead with next value of loop control variable.

(a)break;(b) goto; (c)exit; (d) continue;

ii. The field specifier %c is used for----type data.

(a) void (b) integer(c) char (d) string

iii. Arrays are -----data types.

(a)Primary (b) derived (c) user defined (d) void

iv. The break statement within the switch statement in C language makes the program counter to _____.

a) Go out of the switch statement

b) go to the label default

c) Beginning of the switch statement

d) immediate next case value

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v. _____ is not a string constant.

a) "ABC" b) "123" c) 123 d) "hi"

vi. If a[10] ={111}; then value of a[1] is _____.

a) 111 b) 0 c) garbage value d) 10

II. Answer any <u>SIX</u> questions: **(6x1=6)**

i. What is meant by infinite loop?

ii. Define an array in C language.

iii. Give one example for a valid variable name in C language.

iv. Write the syntax of copy a string to another string.

v. What is the value of 14%-2 in C language?

vi. How is a single character defined in C language?

vii. What is meant by an odd signal?

viii. Define an analog signal.

Contd...2

III. Answer any SIX questions: **(6x2=12)**

i. Write a C Program to print the length of a string accepted from the keyboard.

ii. Write a C program to produce following print out.

1 2 4 16 64 128

iii. With syntax and example explain scanf() statement in C language.

iv. What is the output of the following program?

```
Void main()
    {
       int x=10, y=20;
       printf("%d\t%d", x++,--y);
    }
```

v. How many times the body the loop is executed in the following program?

```
int m=10;
int  n=7;
while(m%n>=0)
{
  --------
   m=m+1;
    n=n+2;
    --------
 }
```

vi. Write a program to print first 10 integers in a single line use any loop statement.

vii. With syntax and example explain the strcmp() function in C language.

viii. Distinguish between energy signal and power signal.

SECTION – B

IV. Answer any FOUR questions: **(4x4=16)**

i. With syntax and example, explain the while statement in C language.

ii. With syntax and example explain the declaration and initialization of one dimensional array in C language.

iii. Write a C program to accept two strings, concatenate them and print all the three strings.

iv. Write a C language program to accept three numbers from keyboard and print the smallest of them.

v. Distinguish between continuous-time and discrete-time signals. Give examples for each type.

vi. With necessary examples explain periodic and non-periodic signals.

SECTION - C

V. Answer any FOUR questions: **(4x5=20)**

i. With necessary examples explain various data types in C language.

Contd...3

ii. Write a program to accept the coefficients of a quadratic equation, find the roots and print them.

iii. With syntax, flowchart and example explain the switch---case statement in C language.

iv. Write a program to accept two matrices and find the sum of them. Print all the three matrices.

v. Write a program to accept a number, find its sum of digits and reverse number. Print the accepted number, sum of digits and reverse number.

vi. Give the block diagram of communication system and explain the signal and system interaction.

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St Aloysius College (Autonomous)

Mangaluru

B.Sc. - Semester VI – Degree Examination

April/May - 2026

COMPUTER SCIENCE – VI (a)

WEB TECHNOLOGIES

Time: 2 ½ Hours. **Max Marks: 60**

PART –A

1. **Answer any SIX of the following.** **(6x2=12)**

a) Differentiate between HTTP and HTTPS.

b) Define the <img> tag with an example.

c) Differentiate between inline, internal and CSS.

d) How do you create a basic CSS transition?

e) How do you create an object in JavaScript?

f) List the different JavaScript operators.

g) What is a servlet in Java?

h) List out two types of cookies in servlets.

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PART –B

Answer any ONE FULL question from each unit. **(4x12=48)**

UNIT - I

2. a) Explain any two HTML Form Control tags with example. **(4)**

b) Explain nested lists in HTML with example. **(4)**

c) Explain Table tag with suitable example. **(4)**

3. a) Differentiate between client-side tools and server-side scripting with suitable examples. **(4)**

b) Explain how to embed audio and video clips in a webpage using HTML. Provide example. **(4)**

c) List and explain any four text formatting tags in HTML. **(4)**

UNIT – II

4. a) Explain external CSS with an example. **(4)**

b) What is an XML namespace? Why is it important? Provide an example. **(4)**

c) Explain any four types of CSS selectors with suitable examples. **(4)**

5. a) Explain about Cascading Style Sheets with an example. **(4)**

b) Write a note on XML elements. **(4)**

c) Explain in detail about CSS Box Model with structure. **(4)**

UNIT – III

6. a) How does the switch statement work in JavaScript? Provide a code example. **(4)**

b) Explain exception handling in JavaScript with a suitable example. **(4)**

c) How does the for loop work in JavaScript? Write a program to demonstrate its use. **(4)**

Contd...2

7. a) Explain the differences between var, let and const in javascript with suitable examples. **(4)**

   b) What are the different data types in JavaScript? Explain each with an example. **(4)**

   c) What is event handling in JavaScript? Explain with an example how to handle a button click event using JavaScript. **(4)**

UNIT – IV

8. a) Explain the lifecycle of a Servlet with a neat diagram. **(4)**

   b) Write a JDBC program to perform the following operation on the student table of the admission database (S_Id, S_Name, S_Address, S_Course):Modify the address of an existing student. **(4)**

   c) Compare CGI with servlets. How does a servlet overcome CGI's limitations? **(4)**

9. a) How do you retrieve request parameters in a servlet? Explain with an example. **(4)**

   b) How do you handle form data submission using servlets? Provide an example. **(4)**

   c) What are cookies? Explain how to create, retrieve, and delete cookies in servlets. **(4)**

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St Aloysius College (Autonomous)

Mangaluru

B.Sc. - Semester VI – Degree Examination

April/May - 2026

COMPUTER SCIENCE – VI (b)

STATISTICAL COMPUTING AND R PROGRAMMING

Time: 2 ½ Hours. **Max Marks: 60**

PART –A

1. **Answer any SIX of the following.** **(6x2=12)**

a) What is error handling in R?

b) Describe the following (i)Type I error (ii)Type II error

c) What is the purpose of readLines() function?

d) What is covariance?

e) Compare and contrast lists and data frames in R.

f) Differentiate between cat and print function in R.

g) What is a box plot?

h) What is the purpose of using as.character(n) in R?

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PART –B

Answer any ONE FULL question from each unit. **(4x12=48)**

UNIT - I

2. a) Explain how elements are accessed, added and removed from vectors in R with example. **(4)**

b) Explain the data frame in detail with an example of R code. **(4)**

c) Write five difference between factor and vector in R. **(4)**

3. a) Explain creating, accessing and modifying elements of an array in R with examples. **(4)**

b) What is a list in R, and how is it different from a vector? Explain with an example of R code. **(4)**

c) Write a note on special values. **(4)**

UNIT – II

4. a) Define a function in R and explain its structure with syntax. **(4)**

b) What functions are used to read and write CSV files in R? Provide example. **(4)**

c) What is the purpose of the try() function in R? Provide an example. **(4)**

5. a) What are some basic plotting functions in R for creating visualizations? Provide example. **(4)**

b) Write an R program to find the factorial of a given number. **(4)**

c) Explain nested loops in R with suitable example. **(4)**

Contd...2

UNIT – III

6. a) Explain different summary statistics measures in R. (4)

   b) Explain three types of kurtosis. (4)

   c) Find the coefficient of variation of the following sample set of numbers.
   1, 5, 6, 8, 10, 40, 65, 88 (4)

7. a) Calculate Pearson's skewness coefficient for a dataset of exam scores:
   85, 88, 92, 94, 96, 98, 100, 100, 100, 100. (4)

   b) Write a note on (a) nominal (b) ordinal (c) Ratio (d) interval (4)

   c) Calculate IQR for following dataset:
   45, 47, 52, 52, 53, 80, 62, 58, 56, 55 (4)

UNIT – IV

8. a) Define Correlation interms of Croxton and Cowden. Explain 2 properties of correlation. (4)

   b) What is analysis of varience (ANOVA)? Explain two types of ANOVA. (4)

   c) In a population the average test score is 75. A group researchers wants to check whether a new learning method has any effect (positive or negative) on students scores. A sample of 36 students who used the new learning method has an average of 82 with standard deviation of 18. At a significance level of $\alpha = 0.05$, test whether the new learning method has affected the students scores. (4)

9. a) Explain Paired sample T Test & One Sample Proportion Test (4)

   b) Explain types of hypotheses. (4)

   c) In the population, the average IQ is 100. A team of scientists wants to test a new medication to see if it has either a positive or negative effect on intelligence, or no effect at all. A sample of 30 participants who have taken the medication has a mean of 140 with a standard deviation of 20. Did the medication affect intelligence? $\alpha = 0.05$ (4)

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(2021 Batch Onwards)

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St Aloysius College (Autonomous)

Mangaluru

B.Sc. - Semester VI – Degree Examination

April/May - 2026

STATISTICS - VI(a)

Statistical Inference - II

Time: 2½ Hours. **Max Marks: 60**

SECTION - A

I. Answer any FIVE of the following: **(5x2=10)**

1. Find the BCR for testing $H_0 : \lambda = \lambda_0$ vs $H_1 : \lambda = \lambda_1$ where $X \sim P(\lambda)$.
2. What is exponential family and name the distributions which belong to exponential family.
3. State any two disadvantages of non-parametric test.
4. Give the alternative non parametric test for "t-test" and "Anova".
5. Write the expression for strength of SPRT.
6. Write the expression of the test statistic of Chi square test for independence of attributes and explain the terms.
7. State any two applications of chi square test.

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SECTION - B

II. Answer any FIVE of the following. **(5x10=50)**

8. Derive the LRT for testing equality of population means when a large sample is drawn from a Normal population with known variances.
9. a) Derive the UMP test for testing $H_0 : p = p_0$ vs testing $H_1 : p = p_1$, when the sample is drawn from a Bernoulli population.

   b) Derive the UMP test for testing $H_0 : \theta = \theta_0$ vs testing $H_1 : \theta = \theta_1$, when the sample is drawn from an Exponential population.
10. a) State any five differences between Parametric tests and Non-Parametric tests.

    b) Derive the expression for the test statistic of Sign test.
11. a) Derive the expression for the test statistic of Median test.

    b) Explain Mood's median test for two sample.
12. a) Derive the SPRT for testing $H_0 : \lambda = \lambda_0$ Vs testing $H_1 : \lambda \neq \lambda_0$ when the sample is drawn from a Poisson population.

    b) Derive the SPRT for testing $H_0 : \theta = \theta_0$ Vs testing $H_1 : \theta \neq \theta_0$, when the sample is drawn from an Exponential population.
13. Derive the SPRT for testing $H_0 : \sigma = \sigma_0$ Vs testing $H_1 : \sigma \neq \sigma_0$, when the sample is drawn from a Normal population with known mean.
14. Derive the expression of chi square test for independence of attributes in case of 2×k contingency table.

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B.Sc. - Semester VI – Degree Examination

April/May - 2026

STATISTICS - VI(b)

Sampling Techniques and Statistics for National Development

Time: $2\frac{1}{2}$ Hours. Max Marks: 60

SECTION - A

I. Answer any FIVE of the following: **(5x2=10)**

1. What is meant by a sample frame?
2. What is the principle of sample survey?
3. Define standard error of an estimator.
4. Prove that under SRSWOR sample mean is unbiased for population mean.
5. What are the advantages of Systematic sampling?
6. What is official statistical data?
7. What is national income estimation?

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SECTION - B

II. Answer any FIVE of the following. **(5x10=50)**

8. a) Explain the principles of sampling.
   b) State any two real life applications of SRSWR and SRSWOR.
9. a) Explain the advantages of sample survey over census survey.
   b) Write a note on types of sampling.
10. Prove that under SRSWOR sample mean square is an unbiased estimator of population mean square.
11. Derive the formula for variance of the sample mean under SRSWOR.
12. Prove that $V(\bar{y}_{st})opt \leq V(\bar{y}_{st})prop \leq V(\bar{y}_{SRS})$.
13. a) Derive an expression for variance of the estimated mean under stratified random sampling, Modify the expression using proportional allocation.
    b) Derive the formula of variance of the sample mean under systematic sampling.
14. Explain the various methods of collecting official statistics.

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(2021 batch onwards)

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B.Sc. Semester VI – Degree Examination

April/May - 2026

BOTANY – VI(a)

Plant Physiology and Biochemistry

Time: 2½ hrs. **Max Marks: 60**

Note: i) Answer all the sections.
ii) Draw diagrams wherever necessary.

SECTION –A

I. Answer any FIVE of the following. **(5x2=10)**

1. What is Transpiration pull?
2. What is diffusion?
3. Write two differences between C2 and C3 plants.
4. What is respiration? Write the chemical equation of respiration.
5. Write any two practical applications of vernalization.
6. What is nyctinastic movement? Give example.
7. What are amino acids? Give examples.
8. What is lock and key model?

SECTION –B

II. Answer any SIX of the following. **(6x5=30)**

1. Describe the external factors affecting the rate of transpiration.
2. Describe Active osmotic absorption of water in plants.
3. What is photosystem? Explain the types.
4. Write the characteristic features of fermentation.
5. Explain a) Treatment with growth regulators b) Scarification.
6. Write short notes on phytochromes.
7. Write the structure of Phospholipids.
8. Write the structure of Starch.

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SECTION –C

III. Answer any TWO of the following. **(2x10=20)**

1. Briefly answer the following
   a) hydroponics b) osmotic pressure c) plant antitranspirants
   d) root pressure e) symptoms due to deficiency of zinc
2. Explain Krebs cycle with a schematic representation.
3. Describe the primary, secondary, tertiary and quaternary structure of proteins.
4. What is fruitening hormone? Give its chemical nature. Add a brief note on plant signalling.

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(2021 batch onwards)

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B.Sc. Semester VI – Degree Examination

April/May - 2026

BOTANY – VI(b)

Plant Biotechnology

Time: 2½ hrs. **Max Marks: 60**

Note: i) Answer all the sections.
ii) Draw diagrams wherever necessary.

SECTION –A

I. Answer any FIVE of the following. **(5x2=10)**

1. What are micronutrients?
2. Mention any two roles of plant biotechnology in environmental sustainability.
3. What do you mean by cell differentiation?
4. Mention the significance of micropropagation.
5. Expand PAGE. Mention its importance.
6. Give any two examples for selectable marker gene.
7. Mention any four application of biotechnology in agriculture.
8. Define gene cloning.

SECTION –B

II. Answer any SIX of the following. **(6x5=30)**

1. Write a note on biohazards.
2. Mention the principle and working of an autoclave.
3. What are the disadvantages of cryopreservation?
4. Write a note on types of batch cultures.
5. Name the causative agent causing crown gall disease. Add a note on its importance in biotechnology.
6. Differentiate vector and vectorless mediated gene transfer.
7. Explain the main genetic modification made to the Flavr Savr Tomato.
8. Explain the concept of bioleaching and its application in mining.

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SECTION –C

III. Answer any TWO of the following. **(2x10=20)**

1. Describe the process of producing plantibodies, including the stages of gene cloning, transformation, and expression.
2. Differentiate between filter and dry heat sterilization.
3. Explain meristem culture in detail.
4. Explain western blot technique.

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(2021 &2023 batch)

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St Aloysius College (Autonomous), Mangaluru

B.Sc. Semester VI - Degree Examination

April/May- 2026

ZOOLOGY- VI(a)

EVOLUTIONARY AND DEVELOPMENTAL BIOLOGY

Time: 2 ½ hrs **Max Marks: 60**

Note: 1. Answer any **ten** questions from Part-A, any **four** questions from Part- B and any **two** questions from part-C.

2. Draw diagrams wherever necessary.

PART-A

I Answer any TEN of the following. **(10X2=20)**

1. Differentiate between microevolution and macroevolution.
2. State any two Pustulates of Lamarckism.
3. Explain Hardy-Weinberg principles and mention its significance.
4. Draw a neat labelled diagram of a mature Graafian follicle.
5. What is oogenesis?
6. Define estrous cycle. Mention its phases.
7. What is a fate map. Mention its significance.
8. Explain meroblastic cleavage in birds.
9. Describe yolk sac placenta with an example.
10. Mention any two theories of aging.
11. Define neoteny. Give an example of an organism exhibiting it.
12. What is metamorphosis. Give one example.

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PART- B

II Answer any FOUR of the following. **(4X5=20)**

1. Compare and contrast abiogenesis and biochemical evolution.
2. Explain menstrual cycle in humans.
3. Describe 24 hours chick embryo.
4. Discuss the histological classification of the placenta with examples.
5. Differentiate between barrier methods and hormonal contraceptives.
6. Write an explanatory note on modes of speciation.

PART- C

III Answer any TWO of the following. **(2X10=20)**

1. Explain in detail the comparative anatomical and physiological evidences supporting the theory of evolution.
2. Illustrate female reproductive system in humans with a neat labelled diagram.
3. Describe the mechanism of gastrulation in frog with a neat labeled diagram
4. Analyse the process of limb development with a labelled diagram.

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(2021 to 2023 batch)

G508DC3.6 Reg No. | | | | | | | |

St Aloysius College (Autonomous), Mangaluru

B.Sc. Semester VI - Degree Examination

April/May- 2026

ZOOLOGY- VI(b)

ENVIRONMENTAL BIOLOGY, WILDLIFE MANAGEMENT AND CONSERVATION

Time: 2 ½ hrs **Max Marks: 60**

Note: 1. Answer any **ten** questions from Part-A, any **four** questions from Part- B and any **two** questions from part-C.

2. Draw diagrams wherever necessary.

PART-A

I Answer any TEN of the following. **(10X2=20)**

1. Differentiate between endoparasitism and ectoparasitism.
2. Define Gause's principles.
3. Give two examples of natural ecosystems.
4. What is ecological stratification? Give one example.
5. Define the term "zonation of the sea."
6. Mention the abiotic factors responsible for formation of biomes.
7. List the objectives of project tiger.
8. What does "vulnerable species" mean?
9. Name two human activities that contribute to climate change and affect wildlife.
10. Mention two non-government organizations (NGOs) working for wildlife conservation.
11. What is Red data book? Mention its importance.
12. Name any two national parks in India and the key species they protect.

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PART- B

II Answer any FOUR of the following. **(4X5=20)**

1. Explain thermal stratification of the pond with a diagram.
2. Write a note on the pyramid of biomass.
3. Differentiate between natality and mortality and discuss the factors influencing them.
4. How do mangroves support marine and terrestrial biodiversity?
5. Enumerate the significance of national parks, wildlife sanctuaries, and biosphere reserves.
6. Differentiate between *in-situ* and *ex-situ* conservation with examples.

PART- C

III Answer any TWO of the following. **(2X10=20)**

1. Describe the different types of food chains with suitable examples.
2. Explain Lentic and Lotic freshwater ecosystems with examples.
3. Elucidate on threats and importance of wildlife conservation. Add a note on project Rhino.
4. What is the significance of natural history museums and biological collections?

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(2021 Batch Onwards)

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St Aloysius College (Autonomous)

Mangaluru

B.Sc. Semester VI – Degree Examination

April/May - 2026

MICROBIOLOGY – VI(a)

IMMUNOLOGY AND MEDICAL MICROBIOLOGY

Time: 2½ hrs. **Max Marks: 60**

Instructions: Draw Diagrams wherever necessary.

Answer all three sections- A, B, and C.

SECTION–A

1. **Define/Answer any <u>TEN</u> of the following:** **(10x2=20)**

a) Define pathogenecity and virulence.

b) Expand MRSA and XDR.

c) Define Excystation.

d) Classification of fungal infection with one example each.

e) Define Positive selection in T cells.

f) Write the importance of NK cells.

g) Weil Felix test.

h) Expand HAT medium.

i) Morphology of *Clostridium tetani*.

j) What are H and N in the influenza viruses?

k) Dendritic cells.

l) Expand ELISA. Mention one application.

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SECTION – B

Answer any <u>FOUR</u> of the following. **(4x5=20)**

2. Design the lab diagnosis for tuberculosis.
3. Write short notes on pathogenesis of Dengue.
4. Describe the physical barriers of innate immunity.
5. What is an epitope? Write the characteristic attributes of an antigen.
6. Mechanism of action of LT toxin in *E.coli*.
7. Describe Anaphylaxis.

SECTION - C

Answer any <u>TWO</u> of the following. **(2x10=20)**

8. Describe the morphology, pathogenesis, and lab diagnosis of *Salmonella typhi.*
9. Explain the mechanism of action of cell wall and cell membrane inhibitors with examples.
10. Define immunity. Classify with examples.
11. Write in detail about the different types of antibodies.

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(2021 Batch Onwards)

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St Aloysius College (Autonomous)

Mangaluru

B.Sc. Semester VI – Degree Examination

April/May - 2026

MICROBIOLOGY – VI(b)

INDUSTRIAL MICROBIOLOGY

Time: 2½ hrs. **Max Marks: 60**

Instructions: Draw Diagrams wherever necessary.

Answer all three sections- A, B, and C.

SECTION–A

1. **Define/Answer any <u>TEN</u> of the following:** **(10x2=20)**

a) Continuous fermentation.

b) List any two objectives of culture preservation.

c) Stirred tank fermentor.

d) Enzyme immobilization.

e) List two important enzymes produced by fermentation.

f) Hydrodynamic cavitation.

g) Chaptalization.

h) Ale.

i) SmF.

j) Malting.

k) List any two key parameters that are preferably kept constant throughout scale-up.

l) Photobioreactor.

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SECTION – B

Answer any <u>FOUR</u> of the following. **(4x5=20)**

2. Explain cell disruption using solvents and alkali.
3. Discuss adsorption and affinity chromatography for product concentration.
4. Discuss Orleans method of vinegar fermentation.
5. Outline industrial fermentation of beer.
6. Discuss the role of chelators and antifoams in medium formulation.
7. Evaluate screening of industrially important microbes.

SECTION - C

Answer any <u>TWO</u> of the following. **(2x10=20)**

8. Outline the design of a fermenter.
9. Assess centrifugation as a method used for biomass separation.
10. Explain the primary and secondary fermentations in grape wine production.
11. Elaborate microbial culture preservation techniques.

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(2021 Batch onwards)

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St Aloysius College (Autonomous)
Mangaluru
B.Sc. Semester VI – Degree Examination
April/May - 2026
BIOCHEMISTRY – VI(a)
BIOENERGETICS AND METABOLISM

Time: 2½ Hours **Max. Marks: 60**

Note: i) Answer all the questions
ii) Draw diagrams wherever necessary

PART – A

1. **Answer any FIVE of the following.** **(5×2=10)**

a) State the first and second laws of thermodynamics.

b) What are glucogenic and ketogenic amino acids.

c) Define gluconeogenesis.

d) What is anaplerosis?

e) Name two important functions of cholesterol in the body.

f) Mention any two importance of phytochromes.

g) Define Nucleotide.

PART – B

Answer any FOUR of the following. **(4X5=20)**

2. Explain the ultrastructure of Chloroplast.
3. Discuss on urea cycle.
4. What are the inhibitors of the electron transport chain? Explain with examples.
5. Give a brief overview on cholesterol biosynthesis.
6. Discuss the integrating role of the TCA cycle in metabolism.
7. Outline cholesterol Biosynthesis.

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PART - C

Answer any THREE of the following: **(3x10=30)**

8. Describe the transport of fatty acids into mitochondria. Explain the role of the carnitine shuttle in fatty acid oxidation.
9. What is the salvage pathway in nucleotide metabolism? Explain its importance and the enzymes involved.
10. Explain Electron transport chain reaction.
11. Explain the regulatory steps involved in glycolysis.
12. Write on HMP shunt pathway.

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St Aloysius College (Autonomous)

Mangaluru

B.Sc. Semester VI – Degree Examination

April/May - 2026

BIOCHEMISTRY – VI(b)

MOLECULAR BIOLOGY AND IMMUNOLOGY

Time: 2½ Hours **Max. Marks: 60**

Note: i) Answer all the questions

ii) Draw diagrams wherever necessary

PART – A

1. **Answer any FIVE of the following.** **(5×2=10)**

a) Who conducted the transformation experiment that provided evidence for DNA as the genetic material?

b) What are the three proposed models of DNA replication?

c) How does the Shine-Dalgarno sequence contribute to translation?

d) What is the role of RNA polymerase?

e) What is a hapten, and how does it contribute to immunogenicity?

f) Name two secondary lymphoid organs.

g) Define Isograft.

PART – B

Answer any FOUR of the following. **(4X5=20)**

2. Give an account on granulocytes.
3. Explain the mechanism of B-cell activation through T dependent pathway
4. Describe the key steps involved in DNA replication
5. Give an account on types of mutations.
6. Explain antibiotic inhibitors during translation.
7. Explain factors contributing Immunogenicity.

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PART - C

Answer any THREE of the following: **(3x10=30)**

8. Explain the steps involved in prokaryotic transcription.
9. Give a detailed account on graft rejection.
10. Explain the different isotypes of immunoglobulins (IgG, IgA, IgM, IgE, IgD) and their functions in immune responses.
11. Give detailed account on physical & chemical mutatgens.
12. Discuss on Lac operon model.

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(2021 Batch onwards)

G 511 DC1.6

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St Aloysius College (Autonomous)
Mangaluru
B.Sc. Semester VI – Degree Examination
April/May - 2026
BIOTECHNOLOGY – VI(a)
Immunology

Time: 2½ Hours **Max. Marks: 60**

Note: i) Answer all the questions
ii) Draw diagrams wherever necessary

PART - A

1. **Answer any FIVE of the following:** **(5x2=10)**

a) Differentiate between innate and adaptive immunity.

b) What are T Cells? Mention their role in immunity.

c) Define hypersensitivity.

d) What is Major Histocompatibility Complex (MHC)?

e) Mention any two applications of radial immunodiffusion.

f) Write the significance of blood grouping.

g) What is autoimmune disorder? Give one example.

h) Mention the role of immune suppressors.

PART – B

Answer any SIX of the following: **(6x5=30)**

2. Differentiate between primary and secondary immune response.
3. What are lymph nodes? Explain their importance in immune system.
4. Explain delayed hypersensitivity reaction.
5. Describe the structure of antibody. Mention the types.
6. What are the advantages and disadvantages of DNA Vaccines?
7. Explain RIA.
8. Write short notes on AIDS.
9. Explain briefly the various serotypes of Typhoid.

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PART – C

Answer any TWO of the following: **(2x10=20)**

10. Explain the mode of infection, symptoms and epidemiology of Malaria.
11. With a neat labelled diagram explain the development of B cells.
12. Explain the steps involved in classical complement pathway.
13. Describe the principle, procedure, and applications of Indirect ELISA.

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(2021 batch onwards)

G 511 DC3.6 Reg. No: | | | | | | | |

St Aloysius College (Autonomous)
Mangaluru
B.Sc. Semester VI – Degree Examination
April/May - 2026
BIOTECHNOLOGY - VI (b)
Bioprocess and Environmental Biotechnology

Time: 2½ Hours **Max. Marks: 60**

Note: i) Answer all the questions
ii) Draw diagrams wherever necessary

PART - A

1. **Answer any FIVE of the following:** **(5×2=10)**

a) Write the difference between Fermentor and Fermenter.

b) What is fed-batch culture? Mention one application.

c) Mention two physical methods used for cell disruption.

d) Name the microorganism commonly used for the production of Penicillin.

e) How the COVID-19 virus is primarily transmitted?

f) Name any two microorganisms that exhibit parasitic interactions in soil.

g) Mention two examples of phosphate-solubilizing microorganisms.

h) Name any two biological methods used in tertiary treatment of waste water.

PART – B

Answer any SIX of the following: **(6×5=30)**

2. Explain the different analogue resistant mutant selection in microbial strain improvement.
3. Discuss process of continuous sterilization of fermentation media.
4. Explain the role of ion exchange chromatography in down stream processing.
5. Describe the process of lyophilization.
6. Discuss the pathogenesis of Shigella infection and its impact on human health.
7. Explain the Anderson method for air sampling.
8. Describe the importance of protozoans as biopesticides with suitable example.
9. Write short notes on bioremediation.

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PART – C

Answer any TWO of the following: **(2×10=20)**

10. Give an account on any two methods employed in secondary treatment of waste water.
11. Explain the formulation of media in fermentation media, providing suitable examples.
12. Explain the construction of stirred tank bioreactor.
13. Describe the causative agent, transmission, and impact of Giardiasis on human health.

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(2021 batch onwards)

G 110 ~~DC1.~~6/G 512 DC1.6 Reg. No. | | | | | | | |

St Aloysius College (Autonomous)

Mangaluru

B.A./B.Sc. Semester VI – Degree Examination

April/May - 2026

COMPUTER ANIMATION – VI (a)

3D RIGGING AND ANIMATION

Time: 2½ hrs. **Max Marks: 60**

PART - A

Answer any FIVE of the following. **(5x2=10)**

1. Where do you find lens glow effects?
2. What is the use of ALT+X?
3. When do you use Bake option?
4. How to repeat the animation without adding keys?
5. How to move or scale the biped bones?
6. What is the use of Detonation of Bomb?
7. How to blur the particles?

PART - B

Answer any FOUR of the following. **(4x5=20)**

8. Explain the steps to create bomb explosion effect.
9. How to create flag flying animation? Explain the steps.
10. Write a note on Curve Editor.
11. How to create facial talking expression?
12. Explain the Snooker game animation techniques.
13. Mention the steps of creating fan animation.

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PART – C

Answer any TWO of the following: **(2x15=30)**

14. Write a brief note on Flowerpot Cracker Animation.
15. Explain the structure of biped.
16. Write a note on static, dynamic & kinematic rigid body.

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(2021 batch onwards)

G 110 DC3.6/G 512 DC3.6 Reg. No. | | | | | | | |

St Aloysius College (Autonomous)

Mangaluru

B.A./B.Sc. Semester VI – Degree Examination

April/May - 2026

COMPUTER ANIMATION – VI (b)

3D DYNAMICS AND EFFECTS

Time: 2½ hrs. **Max Marks: 60**

PART - A

Answer any FIVE of the following. **(5x2=10)**

1. State one advantage of using MASH for motion graphics.
2. Define Mixamo and its primary function.
3. How to create and Adjust Camera in Maya?
4. State the use of dynamic node in MASH.
5. What is nCloth?
6. What is wireframe mode?
7. What are nParticles?

PART - B

Answer any FOUR of the following. **(4x5=20)**

8. Describe the steps to create a galaxy using nParticles.
9. What are Rigid Bodies?
10. How to create an audio spectrum animation using MASH.
11. Describe the applications of MASH in motion graphics.
12. Analyze how MASH nodes help in signal node animation.
13. State the applications of MASH in Animation and VFX.

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PART – C

Answer any TWO of the following: **(2x15=30)**

14. Explain the steps to create a dynamic animation using MASH and also mention the steps to render as video.
15. What is MASH? Explain the key MASH nodes, its applications with an example of a MASH animation of your choice.
16. Define the purpose of Arnold in Maya. Explain its key features and its applications.

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(2022 Batch Onwards)

G 513 DC1.6 Reg. No. : | | | | | | | |

St Aloysius College (Autonomous)

Mangaluru

B.Sc. - Semester VI – Degree Examination

April/May - 2026

ECONOMICS – VI(a)

INTERNATIONAL ECONOMICS

Time: 2½ Hours. **Max. Marks: 60**

SECTION - A

I. Answer any FIVE of the following: **(5×2=10)**

1. Write any two differences between internal and international trade.
2. Give the meaning of terms of trade.
3. List out any the types of quotas.
4. Give the meaning of international dumping.
5. What are the stages of economic integration?
6. Distinguish between balance of payment and balance of trade.
7. Give the meaning of managed exchange rate.
8. Distinguish between IMF and World bank.

SECTION - B

II. Answer any SIX of the following: **(6×5=30)**

9. Briefly explain the importance of international trade.
10. Write a note on H-O theory of international trade.
11. Examine the arguments for free trade.
12. Briefly explain the types of tariffs.
13. Examine the forms and advantages of economic integration.
14. Briefly explain the types of disequilibrium in balance of payment.
15. Examine the advantages of fixed change rate.
16. Explain the balance of payment theory of exchange rate.
17. Briefly explain the objectives and functions of IMF.

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SECTION – C

III. Answer any TWO of the following: **(2×10=20)**

18. Critically explain the comparative cost advantage theory of international trade.
19. Analyze the argument for protection policy.
20. Explain the causes of disequilibrium in balance of payment.
21. Examine the advantages and disadvantages of foreign direct investment.

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(2022 Batch Onwards)

G 513 DC2.6 Reg. No. : | | | | | | | |

St Aloysius College (Autonomous)

Mangaluru

B.Sc. - Semester VI – Degree Examination

April/May - 2026

ECONOMICS – VI(b)

ACTUARIAL ECONOMICS

Time: 2½ Hours. **Max. Marks: 60**

SECTION - A

I. Answer any FIVE of the following: **(5×2=10)**

1. Give the meaning of insurer and insured.
2. What do you mean by livestock insurance?
3. How do you explain risk in life?
4. What are the types of insurance?
5. State an example on domestic travel insurance.
6. Why livestock insurance is yet to take of in rural India?
7. Briefly explain insurance density?
8. What do you mean by capital budgeting?

SECTION - B

II. Answer any SIX of the following: **(6×5=30)**

9. What is accident insurance? Explain.
10. Write a note on accident insurance.
11. Briefly explain the case study related to livestock insurance policy.
12. Write a note on marine insurance.
13. Why social insurance is important? Explain with case studies.
14. Write a note on principles of insurance.
15. Write a note on motor insurance.
16. Write a note on marine insurance.
17. Write a note on nature and scope of fire insurance.

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SECTION – C

III. Answer any TWO of the following: **(2×10=20)**

18. Distinguish between life insurance and fire insurance.
19. What is insurance/ explain the types of insurance.
20. Briefly explain pet and cattle insurance: The untapped market in India with SWOT analysis.
21. Briefly explain the benefits of the life insurance.

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(2021 Batch Onwards)

G 514 DC1.6 Reg. No. : | | | | | | | |

St Aloysius College (Autonomous)

Mangaluru

B.Sc. Semester VI – Degree Examination

April/May – 2026

FOOD SCIENCE – VI(a)

INTRODUCTION TO MEAT, FISH AND POULTRY PROCESSING

Time: 2½ Hours **Max. Marks: 60**

Note: i) Answer all the questions

ii) Draw diagrams wherever necessary

PART – A

1. **Answer any FIVE of the following.** **(2×5=10)**

a) Name any two types of slaughter facilities mentioned in the meat industry structure.

b) Name the three groups of muscle proteins based on solubility.

c) What is enzymatic tenderization?

d) Mention two types of sausages.

e) List two examples of marine products.

f) What is thermal processing of fish?

g) Name causes of egg spoilage.

PART – B

Answer any SIX of the following. **(5X6=30)**

2. Discuss role of eggs in emulsification, foaming and binding processes.
3. Explain the water holding capacity and factors affecting it.
4. Explain the structure of myoglobin.
5. Differentiate between dry ageing and wet ageing.
6. Describe the biochemical changes occurring during ageing of meat.
7. Explain preservation of fish using irradiation and its advantages.
8. Describe postmortem changes occurring in fish after harvest.
9. Explain processing methods for production of egg powder and albumen powder.

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PART – C

Answer any TWO of the following: **(10x2=20)**

10. Explain processing methods used for production of liquid egg products.
11. Explain radiation processing and canning methods used in fish preservation.
12. Describe the major global commercial fisheries resources and explain the recent trends in world meat production.

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(2021 Batch Onwards)

G 514 DC3.6 Reg. No. : | | | | | | | |

St Aloysius College (Autonomous)

Mangaluru

B.Sc. Semester VI – Degree Examination

April/May – 2026

FOOD SCIENCE – VI(b)

WASTE MANAGEMENT IN FOOD INDUSTRY

Time: 2½ Hours **Max. Marks: 60**

Note: i) Answer all the questions

ii) Draw diagrams wherever necessary

PART – A

1. **Answer any FIVE of the following.** **(2×5=10)**

a) Categorize waste based on its origin.

b) Define biofilters?

c) State the purpose of screening in wastewater treatment?

d) What is the main difference between aerobic and anaerobic digestion?

e) Write a note on Rice bran oil and how is it obtained?

f) Describe fish meal and how is it produced?

g) What does a high BOD value indicate about water quality?

PART – B

Answer any SIX of the following. **(5X6=30)**

2. Give an account on different types of farm wastes generated.
3. Explain how wastewater treatment helps in reducing environmental pollution
4. Discuss the potential of different food wastes as a raw material for biofuel production.
5. Classify and describe on the different types of waste waters.
6. Explain the working of Membrane Bio-reactors.
7. Explain the utilization of wastes generated from Rice milling Industries.
8. How are wastes generated in the meat and poultry industry classified? Explain.
9. Draw a neat labelled diagram and explain incineration process for waste management.

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PART – C

Answer any TWO of the following: **(10x2=20)**

10. a) Write a note on coagulation and floatation.

b) Write in detail about recycling and land filling of food waste.

11. Explain the by-product utilization of wastes generated from Beverage Industry.
12. Explain the solvent extraction method used for recovery of compounds.

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(2022 and 2023 batch only)

G 701 DC1.6 Reg. No.: | | | | | | | |

St Aloysius College (Autonomous)

Mangaluru

B.Sc (Visual Communication)

Semester VI– Degree Examination

April/May-2026

ADVERTISING

Time: $2^1/_2$ Hours **Max Marks: 60**

SECTION – A

Answer any FIVE of the following. **(5x2=10)**

1. Jingle
2. TV commercials
3. PSA
4. Product advertising
5. Advertising as persuasive communication
6. TRP
7. Influencer Advertising

SECTION - B

Answer any FOUR of the following. **(4x5=20)**

8. Explain the Concept of Advertorial with suitable examples.
9. What are the steps involved in audience analysis?
10. Explain the elements of print ad copy.
11. Explain SMART campaign objectives.
12. How does BARC measure Television Viewership India?
13. Differentiate briefly between Classified Ads and Display Ads.

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SECTION – C

Answer any TWO of the following. **(2x15=30)**

14. Analyse the advertising agency structure and workflow.
15. Explain the key features of advertising with examples.
16. Outdoor Advertising remains relevant even in the digital age. Explain this statement by discussing various types of outdoor advertising with examples.

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(2022 and 2023 batch only)

G 701 DC2.6 Reg. No.: | | | | | | | |

St Aloysius College (Autonomous)

Mangaluru

B.Sc (Visual Communication)

Semester VI – Degree Examination

April/May-2026

FUNDAMENTALS OF FILM EDITING

Time: $2^1/_2$ Hours **Max Marks: 60**

SECTION – A

Answer any FIVE of the following. **(5x2=10)**

1. J Cut
2. Editing
3. Dissolve
4. Loop
5. Ripple Edit
6. Scaling and Positioning
7. Storyboard

SECTION - B

Answer any FOUR of the following. **(4x5=20)**

8. What is a chroma screen, and why is it used in filmmaking?
9. Describe the role of selection and review in ensuring a smooth editing workflow.
10. Explain why editing is considered the "invisible art" in filmmaking.
11. Discuss the significance of elliptical editing in compressing time.
12. Analyze how chroma key technology was used in a famous blockbuster film.
13. How does editing manipulate the rhythm and pace of a film?

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SECTION – C

Answer any TWO of the following. **(2x15=30)**

14. Describe how time compression can enhance storytelling in documentaries and commercial films.
15. Assess the advantages and disadvantages of using chroma screens versus practical sets.
16. Explain how diegetic sound enhances realism in a film. Give references from the movies you watched.

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(2022 and 2023 batch only)

G 701 DC3.6 Reg. No.: | | | | | | | |

St Aloysius College (Autonomous)

Mangaluru

B.Sc. (Visual Communication)- Semester VI

Degree Examination

April/May-2026

MEDIA MANAGEMENT

Time: $2^1/_2$ Hours **Max Marks: 60**

SECTION – A

Answer any FIVE of the following. **(5x2=10)**

1. Leadership
2. Vertical Integration
3. Licensing
4. Production
5. Feedback in Management
6. Company Ownership in Media
7. Paid News

SECTION - B

Answer any FOUR of the following. **(4x5=20)**

8. Discuss the qualities of an effective media manager.
9. What is media economics. Explain its importance.
10. Explain any two legal challenges faced by online journalism.
11. Discuss the economic structure of print media, focusing on costs, revenues, and circulation.
12. Discuss the importance of social media strategies for media organizations.
13. Write a short note on media convergence.

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SECTION – C

Answer any TWO of the following. **(2x15=30)**

14. Explain Henry Fayol's principles of management and relate them to media organisations.
15. Evaluate the impact of media convergence on media organisations and management strategies.
16. Describe the concept of franchising in media organisations.

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