

Sardar Patel University

M. Sc. Integrated Biotechnology Examination, First Semester (NC)

Monday, 27th March, 2017

10:00 a.m. to 01:00 p.m.

PS01CIGB01: Physics – I

Total Marks: 70

- Notes: - (1) Figures to the right indicate marks;
 (2) Draw neat and labeled diagram, wherever necessary.

Q-1. Multiple Choice Questions-

[8]

- (1) Point at which all rays converge is termed as _____.
 (a) converging point (b) focal point (c) focal center (d) converging center
- (2) Michelson's interferometer can be used to measure _____.
 (a) Intensity of light (b) Michelson of light (c) Amplitude of light (d) none of these
- (3) Huygen's eyepiece is useful where we want to _____.
 (a) Eliminate spherical as well as chromatic aberration (b) Eliminate coma
 (c) Eliminate chromatic aberration (d) Eliminate distortion
- (4) Power of lens is _____.
 (a) $1/p$ (b) $1/q$ (c) $1/f$ (d) $1/m$
- (5) The main principle of Optical fiber communication is _____ of light?
 (a) Diffraction (b) total internal reflection (c) refraction (d) dispersion
- (6) The light gathering capacity of optical fiber is known as _____.
 (a) Numerical aperture (b) acceptance angle (c) incidence angle (d) critical angle
- (7) Planck's constant is _____.
 (a) 6.62×10^{-34} J.sec (b) 6.62×10^{-34} J.min (c) 6.62×10^{-34} Cal.sec (d) 6.62×10^{-34} Cal.min
- (8) Who discovered alpha particles?
 (a) Rutherford (b) Maxwell (c) Bragg (d) Boltzmann

Q-2. Answer the following questions in short. (Any Seven)

[14]

- (1) Differentiate between Fresnel and Frounhofer diffraction phenomenon.
- (2) State and explain law of superposition.
- (3) Give the Rayleigh's criterion for diffraction.
- (4) What is a lens? Enlist the types of lenses.
- (5) Explain the term refraction and reflection of lens.
- (6) Explain spontaneous emission of radiation.
- (7) List the applications of LASER.
- (8) Explain Bragg's law.
- (9) Give a note on emission spectra.

- Q-3. (A)** Explain the Newton's rings experiment for reflection of light and derive the necessary formula for dark and bright ring. [6]
- (B)** Derive the expression for the resolving power of plane diffraction grating. [6]

OR

- (B)** (i) State and explain Malu's law. [3]
- (ii) State and explain Brewster's law. [3]

(P.T.O.)

- Q-4. (A) Define and explain spherical aberrations in lens system [6]
(B) List and explain all the Cardinal points of an optical system of lenses. [6]
- OR**
- (B) (i) List the characteristics of Huygen eyepiece. [3]
(ii) Calculate the power the lens, focal length of lens 15cm. [3]
- Q-5. (A) Explain construction and working of Ruby Laser. [6]
(B) Discuss the optical fiber communication system network. [6]
- OR**
- (B) (i) List the properties of LASER. [3]
(ii) Explain the principal of holography. [3]
- Q-6. (A) Explain the production of X-rays using Modern Coolidge tube. [6]
(B) Discuss the characteristics of photoelectric effect. [6]
- OR**
- (B) (i) Explain Compton effect. [3]
(ii) State and explain De Broglie hypothesis. [3]

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(35A & A-42)

Seat No.:

No. of printed pages: 02

SARDAR PATEL UNIVERSITY

M.Sc. (Integrated) Biotechnology, First Semester Examination

**Tuesday, 28th March,
2017**

10.00 a.m. to 1.00 p.m.

Organic Chemistry: PS01CIGB02

Total Marks : 70

Note: (i) All questions are to be attempted.

(ii) Figures to the right indicate marks.

Q-1 Choose the correct option for the following :

[08]

- (i) A secondary carbon of alkyl halide is bonded directly to
(a) two hydrogen (b) three hydrogen (c) two carbons (d) four carbons
- (ii) Carbanion is produced upon bond cleavage.
(a) heterolytic (b) homolytic (c) heating (d) both 'a' & 'b'
- (iii) General molecular formula C_nH_{2n+2} belongs to
(a) alkene (b) alkane (c) cycloalkane (d) benzene
- (iv) n-butane shows conformational isomers.
(a) 1 (b) 3 (c) 4 (d) 6
- (v) Compounds having molecular & structural formula are called isomer.
(a) same, same (b) different, same
(c) same, different (d) different, different
- (vi) undergo addition reaction under normal condition.
(a) alkane (b) alkene (c) benzene (d) none of these.
- (vii) Which one is the derivative of benzoic acid ?
(a) acetic acid (b) benzamide (c) cinnamic acid (d) oxalic acid
- (viii) Cyclohexane is an example of compound.
(a) aliphatic (b) aromatic (c) heterocyclic (d) cyclic

Q-2 Answer the following : (Attempt any seven)

[14]

- (i) Write structural formula for : (a) Aniline (b) Toluene.
- (ii) Write structure of n-pentane and Isobutylene.
- (iii) Define : Carbene and free radical with an example.
- (iv) Distinguish between : Homolysis and Heterolysis bond cleavage.
- (v) Explain hybridization and draw the structure of ethane.
- (vi) Define Saytzeff rule with an example.
- (vii) Define and explain the stability order of carbanion.
- (viii) Draw isomers for the compound having molecular formula C_3H_7Cl .
- (ix) Explain the basic nature of Amines.

(1)

(PTO)

- Q-3 (A) Answer the following : [6]
 (i) Write structure and IUPAC name for all possible isomers of molecular formulae C_5H_{12} .
 (ii) Write Chain reaction. Also write its reaction mechanism.
- (B) Write structure for the following : [6]
 (i) Benzoic acid, (ii) n-Decane, (iii) Butyl alcohol, (iv) Isoprene,
 (v) Cresol and (vi) Vinyl chloride.
- OR
- (B) Define carbocation. Write Wagner-Meerwein rearrangement and its reaction mechanism. [6]
- Q-4 (A) Define Homologous series. Write any two preparation method of alkenes. [6]
 (B) Explain cyclopropane is least stable via Bayer's strain theory. Also give advantages and disadvantages of Bayer's strain theory. [6]
- OR
- (B) Define conformers. Draw conformers of ethane and explain its stability. [6]
- Q-5 (A) Answer the following : [6]
 (i) Discuss the physical properties of alkenes.
 (ii) Write Markonikov's and anti-Markonikov's rule with an example.
- (B) Identify the product of following reaction and suggest mechanism involved in it. [6]
 (i) Hydroxylation reaction of alkene.
 (ii) Oxymercuration- Demercuration reaction of alkene.
- OR
- (B) Write Ozonolysis reaction of alkene and Deils-Alder reactions with its mechanism. [6]
- Q-6 (A) Define S_N1 and S_N2 reactions mechanism and write the reaction of benzoic acid with [6]
 (i) Ethyl alcohol (ii) NH_3
- (B) Answer the following : [6]
 (i) Write reaction mechanism for the alkaline hydrolysis of esters.
 (ii) Give structural formula's for : (a) Thiophene (b) Pyridine.
- OR
- (B) Answer the following : [6]
 (i) Give reaction mechanism for the nucleophilic aliphatic substitution reaction in case of alkyl halide.
 (ii) Write the advantages of Sand Meyer reaction.

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SARDAR PATEL UNIVERSITY

External theory examination

M.Sc. (IGBT) Semester I (NC)

PSO1CIGB03 – Introduction to computers

30th March, 2017, Thursday

Time: 10:00 a.m. to 1:00 p.m.

Q-1 Multiple choice questions.

[08]

- 1 The second generation computer are made from _____.
A) Vacuum tubes C) Transistors
B) Integrated Circuits D) None of these
- 2 (123ABC) is an example of _____ number system.
A) Binary C) hexadecimal
B) Decimal D) octal
- 3 _____ mouse uses laser technology to detect the mouse movement.
A) Mechanical C) Optomechanical
B) Optical D) None of these
- 4 _____ tool allows you to apply colors to lines and outlines.
A) Ink bottle C) Paint Bucket
B) Dropper D) None of these
- 5 Which one of these is used for spreadsheet preparation?
A) MS Word C) MS Excel
B) MS Access D) All of these
- 6 The intersection of row and column in MS Excel is known as
A) Cell C) Function
B) Both a and b D) None of these
- 7 _____ tag is used to create hyperlinks.
A) <href> C) <lnk>
B) <a> D) None of these
- 8 _____ is the extension of a Flash file.
A) .html C) .fla
B) .fsh D) .fal

Q-2 Answer the following short questions(Any SEVEN).

[14]

- 1 Explain 10's complement method.
- 2 List out the generations of computer.
- 3 Differentiate : Volatile memory vs. Nonvolatile memory
- 4 What is the use of internet?
- 5 Write the breakline and heading tags of HTML.
- 6 What is Cell, Cell Pointer and Cell Address in Excel?
- 7 What is the use of Flash?
- 8 How the images are inserted into webpage in HTML?
- 9 Write basic tags for creating the HTML table.

P.T.O.

- Q-3** Discuss the applications of computers in different fields. [06]
A
B Write a detail note on First generation of computers. [06]
OR
B Explain number system with examples. [06]
- Q-4** What is operating system? Explain the types of operating system. [06]
A
B Explain in detail E-mail with its advantages and disadvantages. [06]
OR
B Give a detailed note on keyboard and mouse. [06]
- Q-5** Write a short note on paragraph formatting in MS Word. [06]
A
B Explain header and footer facility of MS Word. [06]
OR
B Discuss Chart facility of MS Excel. [06]
- Q-6** Explain table tag along with formatting style. [06]
A
B Enlist and explain tools available for drawing and painting in Flash. [06]
OR
B Write a short note on HTML forms. [06]



Q II Answer the following in short. (Attempt any seven)

[14]

1. Mention the characters of phylum arthropoda.
2. Enlist the general characters of class amphibia.
3. Sketch and label adipose tissue.
4. State the location and functions of areolar connective tissues.
5. What is sporulation?
6. Define parasitic nutrition.
7. Distinguish between open and closed circulatory system.
8. What is inbreeding?
9. What is muscular movement?

QIII a. Mention the general characters of phylum annelida and classify it upto classes giving examples.

[06]

b. Write a note on : General characters of class mammalia.

[06]

OR

b. Give an account on general characters of class reptilia.

[06]

QIV a. Write a note on simple epithelial tissues.

[06]

b. Give an account on skeletal muscles.

[06]

OR

b. Describe nerve fiber with suitable diagram.

[06]

QV a. Write a note on white blood cells.

[06]

b. Give an account on steps of holozoic nutrition.

[06]

OR

b. Write a note on regulatory centers of respiration.

[06]

QVI a. Write a note on amoeboid movement.

[06]

b. Mention the symptoms, prevention and control measures of AIDS.

[06]

OR

b. Write a note on : Importance of wildlife.

[06]

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(43) SEAT No. _____

No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY
M. Sc (Int.) Biotechnology: First semester Examination
IGBT-Ist SEMESTER (MC)
Sub: PS01CIGB05 - PLANT SCIENCES
Saturday, 1st April, 2017
Time: 10:00 a.m. to 1:00 p.m.

Total Marks: 70

Q.1 Fill in the blanks by choosing appropriate option. (08)

- (a) Spirogyra is an example of
(a) Bryophytes (b) Lichen (c) Algae (d) Fungi
- (b) The shape of chloroplast found in Spirogyra
(a) Spiral (b) Flat (c) cup shaped (d) none of them
- (c) Botanical name of Tulsi is
(a) *Solanum album* (b) *Ocimum santum* (c) *Adhoda vasica* (d) None of them
- (d) Maize considered as
(a) Monocot plant (b) dicot plant (c) gymnosperms plant (d) All of them
- (e) Artificial pollination included
(a) Cutting (ii) Layering (iii) Grafting (iv) all of them
- (f) When pollen tube enters through integuments, is called as....
(a) Mesogamy (b) Porogamy (c) Chalazogamy (d) Isogamy
- (g) Xylem and Phloem considered as a
(a) Complex tissue (b) Primary tissues (c) Animal tissue (d) None of these
- (h) In dominant epistasis, the phenotypic ratio of 9:3:3:1 is modified to....
(a) 9:3:4 (b) 9:7 (c) 12:3:1 (d) 15:1

Q.2 Answer the following in short. (Any SEVEN) (14)

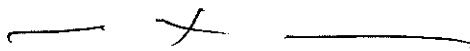
- (a) Sketch and label of Riccia thallus.
- (b) What is Lichen? Write about its types.
- (c) Sketch and label of Spirogyra algae
- (d) Write any four characters of Solanaceae family
- (e) Give the suitable example of Natural vegetative reproduction.
- (f) Write botanical name and medicinal properties of Neem.
- (g) Write down the method of grafting techniques. Explain bud grafting in short.
- (h) Enlist the name of permanent tissue
- (i) Why Mendel called as the "Father of genetics"

(1)

(P.T.O)

- Q.3 (a) Write note on Ricca external features (06)
(b) Briefly describe sexual reproduction and life cycle of Mucor. (06)
OR
(b) Explain reproduction and Life cycle of Fern . (06)
- Q.4 (a) Write the botanical name, family and medical important of Akado and Ardushi. (06)
(b) Describe internal structure features of Cycas leaflet. (06)
OR
(b) Discuss the identifying character and economic importance of the family Malvaceae (06)
- Q.5 (a) Discuss different types of ovules with suitable diagrams. (06)
(b) Give an account on Artificial propagation in plants (06)
OR
(b) What is pollination? Give detail description about its various types (06)
- Q.6 (a) Write note on (i) Dihybrid cross (ii) Back cross (06)
(b) Explain Seven characters of Pea plant studied by Mendel (06)
OR
(b) Explain Recessive epistasis with suitable example. (06)

Best of Luck



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[707 A33]

SEAT No. _____

No. of Printed Pages: 02

SARDAR PATEL UNIVERSITY

M. Sc. Integrated Biotechnology (IGBT) 1st Semester

Theory Exam – April 2017

PS01CIGB06 – Biomathematics

3rd April 2017 (Monday), 10 am to 1 pm

Maximum Marks: 70

- Note: 1) All the Questions are compulsory.
2) Figures on the right indicate marks.**

Q.1 Choose the correct option.

1x8= 8

- (1) If $R = \{(1, 1), (2, 3), (4, 5)\}$, then domain of the function is?
(a) $\{1,2,4\}$ (b) $\{2,3,4,5\}$ (c) $\{1,1,4,5\}$ (d) $\{1,3,5\}$
- (2) $(x-h)^2 + (y-k)^2 = a^2$ represents the.....
(a) parabola opening upward (b) parabola opening downward
(c) straight line (d) circle
- (3) Equation of a linear function with slope (-3) and y- intercept 7 is
(a) $y = 7x - 3$ (b) $y = -3x + 7$ (c) $y = -3$ (d) $x = -3y + 5$
- (4) The derivative of a function $e^{3x} =$
(a) $3x$ (b) $3 \frac{1}{x}$ (c) $\frac{1}{\log x}$ (d) $3e^{3x}$
- (5) $\int \cos x \, dx =$
(a) $\sin x + C$ (b) $-\sin x + C$ (c) $\cos x + C$ (d) $-\cos x + C$
- (6) The integration is also known as.....
(a) summation (b) antiderivative (c) combination (d) none of these
- (7) Transpose of a column matrix is.....
(a) Zero matrix (b) Diagonal matrix (c) Column matrix (d) Row matrix
- (8) A matrix having m rows and n columns with $m \neq n$ is said to be a.....
(a) Square matrix (b) Rectangular matrix (c) Identity matrix (d) Scalar matrix

Q.2. Attempt any Seven of the following:

2x7= 14

- (1) If $A = \{3,4,7\}$ and $B = \{2,3,4,5,6\}$ find the intersection of set A and set B
- (2) Find slope and y-intercept of $2x + 4y = 15$
- (3) Find domain and range of $f(x) = \frac{x+5}{x-4}$
- (4) Calculate $\lim_{x \rightarrow -2} (3x^2 + 2x)$.
- (5) Find dy/dx when $y = 4 \log x$.

(6) Evaluate $\int \sin x^4 \cos x \, dx$.

(7) Calculate $\partial z / \partial x$, when $z = \ln x$.

(8) Define with example: Transpose matrix, Symmetric matrix

(9) If $A = \begin{bmatrix} 2 & 3 \\ -1 & -2 \end{bmatrix}$ the find the matrix $3A$.

Q.3 (A) If $f(x) = 2x^2 + 3x + 7$, evaluate $f(-2/3)$, $f(a+h)$ and $[f(a+h) - f(a)]/h$. [06]

(B) (i) Find the equation of a straight line through the point $(-1,3)$ with slope 2. [03]

(ii) For given equation find the vertex of parabola, $2x^2 - x - 4y + 7 = 0$ [03]

OR

(B) Prove that $\frac{1+\operatorname{cosec}\theta}{1-\operatorname{cosec}\theta} = (\sec\theta + \tan\theta)^2$ [06]

Q.4 (A) If $y = (t^2 + 1)^2$, find the second derivative of the given function. [06]

(B) Find the derivative of y , when $y = (x^2 + 5x)(2 - x^2)^4$. [06]

OR

(B) Evaluate $\lim_{x \rightarrow 1} \frac{\sqrt{2-x}-1}{2-\sqrt{x+3}}$. [06]

Q.5 (A) Find integral of $(y - \frac{3}{y})^2$. [06]

(B) Evaluate $\int \frac{1}{\sqrt{9-x^2}} \, dx$. [06]

OR

(B) Calculate second order partial derivative of a function, $z = 2xy^4$. [06]

Q.6 (A) If $A = \begin{bmatrix} 2 & -4 \\ 3 & 2 \\ -1 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} -3 & 1 \\ 0 & 5 \\ 4 & -2 \end{bmatrix}$, then find $A+B$, $2A+B$, $A-2B$. [06]

(B) If $A = \begin{bmatrix} 1 & 2 & 5 \\ 5 & 1 & 1 \\ 3 & 0 & 4 \end{bmatrix}$, find $A - A^T$ and $A + A^T$. [06]

OR

(B) Find eigen value and eigen vectors of $\begin{bmatrix} 4 & 2 & 1 \\ -3 & 1 & -5 \\ 2 & -9 & -8 \end{bmatrix}$. [06]
