No. of Printed Pages : **2**

21BSC6C13CHL

B.Sc. VI Semester Degree Examination, Sept./Oct. - 2024

CHEMISTRY

DSC-7 : Advanced Inorganic and Physical Chemistry

(NEP)

Time : 2 Hours Maximum Marks : 60

Note : *Answer **all** sections.*

SECTION - A

Answer the following sub-questions. Each sub-question carries **one** mark. **10x1=10**

1. (a) Define stepwise stability constant. **1**

(b) What is kinetic stability of metal complexes ? **1**

(c) Write the structure of trans-isomer of co-ordination number 4. **1**

(d) Give an example of weak field ligand. **1**

(e) What is Spectroscopic ground state ? **1**

(f) What is Racah parameter ? **1**

(g) Define partial molar volume. **1**

(h) Define activity coefficient. **1**

(i) What is ionic atmosphere ? **1**

(j) When ion pair formation is possible according to Bjerrum mode ? **1**

SECTION - B

Answer **any four** of the following questions. Each question carries **five** marks. **4x5=20**

2. Write a note on determination of binary formation constant by Polarigraphic method. **5**

3. Explain the geometrical isomerism in co-ordination number 6 with example. **5**

4. Discuss the colour of transition metal complexes on the basis of CFT. **5**

5. Write a note on Tanaubo-Sugano diagrams. **5**

P.T.O.

6. Explain the following excess thermodynamic functions. **5**

(a) Excess Gibbs free energy

(b) Excess Entropy

7. Explain Debye-Huckel theory for the problem of activity coefficient. **5**

SECTION - C

Answer **any three** of the following questions. Each question carries **ten** marks. **3x10=30**

8. (a) Discuss briefly the factors affecting the stability of metal complexes with reference to nature of metal ion and ligand. **6**

(b) Derive the relationship between stepwise formation constants and overall formation constant. **4**

9. (a) Draw crystal field splitting diagram in tetrahedral and square planar geometry. **6**

(b) Discuss the magnetic properties of octahedral complexes on the basis of CFT. **4**

10. (a) Explain the determination of magnetic susceptibility of complexes by Gouy method. **6**

(b) Write a note on orbital contribution to magnetic property. **4**

11. (a) Define phase rule. Derive the phase rule from the concept of chemical potential. **6**

(b) Discuss the ideal and non-ideal systems in thermodynamics. **4**

12. (a) Derive an expression for electro capillary Lippmann's equation. **6**

(b) Explain briefly activation over potential. **4**

- o 0 o -

No. of Printed Pages : **2**

21BSC6C15CHL

B.Sc. VI Semester Degree Examination, Sept./Oct. - 2024

CHEMISTRY

DSC - 8 : Advanced Organic Chemistry & Thermal Methods

(NEP)

Time : 2 Hours | Maximum Marks : 60

Note : *Answer **all** the sections.*

SECTION - A

Answer the following sub-questions. Each sub-question carries **one** mark. **10x1=10**

1. (a) Write the Schiemann reaction. **1**

(b) What is amination reaction ? **1**

(c) Give an example of tripeptide. **1**

(d) What is Beckmann rearrangement reaction ? **1**

(e) What is Stereoselectivity ? **1**

(f) Write the Michael reaction. **1**

(g) Define point group. **1**

(h) What is Differential Scanning Colorimetry ? **1**

(i) Define character table. **1**

(j) What is meant by thermogravimetry analysis ? **1**

SECTION - B

Answer **any four** of the following questions. **4x5=20**

2. Explain Benzyne mechanism. **5**

3. Explain the hydrogenation of double bond and triple bond with example. **5**

4. Explain the protection of amino group by Benzyloxy Carbonyl group (z). **5**

5. Discuss reducible and irreducible representation. **5**

6. Explain the basic principle of DTA. **5**

7. Write the great orthogonal theorem equation and give its applications. **5**

P.T.O.

SECTION - C

Answer **any three** of the following questions. **3x10=30**

8. (a) Explain the arenium ion mechanism. **6**

(b) Write the following reactions : **4**

(i) Vilsmeier - Haack reaction.

(ii) Gatterman reaction.

9. (a) Explain the addition of Grignard reagent to Carbonyl Compounds. **6**

(b) Explain E_1CB mechanism. **4**

10. (a) Explain Pinacol - Pinacolone rearrangement reaction. **6**

(b) Discuss the cleavage of peptide bond by chemical and enzymatic method. **4**

11. (a) Explain the symmetry elements and symmetry operations. **6**

(b) Write the character table of C_3 and C_{2V} point group. **4**

12. (a) Explain the techniques for quantitative estimation of Ca and Mg from their mixture. **6**

(b) Explain the basic principles of conductometric titrations. **4**

- o O o -

No. of Printed Pages : **2**

21BSC6C13BOTL

B.Sc. VI Semester Degree Examination, Sept./Oct. - 2024

BOTANY

DSC 13 : Cell Biology
(NEP)

Time : 2 Hours | Maximum Marks : 60

Note : *(i) Answer **all** the questions.*

(ii) Draw the diagrams wherever necessary.

SECTION - A

Answer **all** the sub-questions. **10x1=10**

1. (a) Who coined the term cell ?

(b) Define plasmodesmata.

(c) Define pinocytosis.

(d) Name the power house of cell.

(e) Expand r-RNA.

(f) What are Lysosomes ?

(g) What is Chaisma ?

(h) What is centrifugation ?

(i) What are spindle fibres ?

(j) Name any one cytochemical stain.

SECTION - B

Answer **any four** of the following **4x5=20**

2. Write a note on cell theory.

3. Describe the structural organization of mitochondria.

4. Write a note on Golgi apparatus organization.

5. Write a note on causes of Cancer.

6. Describe the embedding procedure with reference to fixation.

7. Write a note on structure of Endoplasmic reticulum.

P.T.O.

SECTION - C

Answer **any three** of the following. **3x10=30**

8. Describe the ultrastructure of Nucleus.

9. Write short notes on :
(a) Glycocalyx
(b) Cell wall

10. Describe the biogenesis of mitochondria.

11. Describe the different phases of mitosis with neat labelled diagram.

12. Write short notes on :
(a) Detection of Aldehydes
(b) Flow sorting cytometry

- o 0 o -

No. of Printed Pages : **2**

21BSC6C15PHL

B.Sc. VI Semester Degree Examination, Sept./Oct. - 2024

PHYSICS

8 : Electronic Instrumentation and Sensors

(NEP)

Time : 2 Hours Maximum Marks : 60

*Note : Answer **all** the Sections.*

SECTION - A

Answer the following sub-questions, each sub-question carry **one** mark. **10x1=10**

1. (a) Define Rectification.

(b) Define Ripple Factor.

(c) Write the expression for cut-off frequency for Low Pass Filter.

(d) What is the function of a Capacitive Filter ?

(e) What is the function of op-amp in Active Filter ?

(f) Write any one application of standard signal generator.

(g) What is Digital Display System ?

(h) Write any one application of Photo diode.

(i) What is Piezo-electric Transducer ?

(j) What is Fixed Frequency ?

SECTION - B

Answer **any four** of the following questions, each question carries **five** marks. **4x5=20**

2. What is AC Power ? Mention its characteristics.

3. What are Active and Passive Filters ? Explain.

4. Explain Digital to Analog and Analog to Digital Converters.

5. Explain the working of R-2R Ladder type D/A Convertor.

6. What is transducer ? Discuss its types.

7. Explain the principle and construction of Linear Variable Differential Transducer.

P.T.O.

SECTION - C

Answer **any three** of the following questions, each question carries **ten** marks. **3x10=30**

8. With a neat block diagram explain the construction and working of Cathode Ray Oscilloscope. **10**

9. (a) With a neat block diagram explain AF sine and square wave generator using wein bridge network and oscillators. **7**

(b) Determine the low cut-off frequency f_L of a High Pass filter R = 47 k Ohm and C = 0.0022 μF. **3**

10. (a) Explain the construction and working of LCD. **7**

(b) Write any three applications of LCD. **3**

11. (a) Explain the principle and working of Photo diode. **7**

(b) What is Thermister ? Mention its types. **3**

12. (a) What is the need for DC Power Supply ? Mention its characteristics. **5**

(b) Explain triangular wave generator with wave form. **5**

- o 0 o -

No. of Printed Pages : **2**

21BSC6C13PHL

B.Sc. VI Semester Degree Examination, Sept./Oct. - 2024

PHYSICS

DSC-3 - 07 : Elements of Condensed Matter and Nuclear Physics

(NEP)

Time : 2 Hours Maximum Marks : 60

Note : *(i) Answer **all** the sections.*

(ii) Non-programmed scientific calculators are allowed.

SECTION - A

I. Answer the following questions. **10x1=10**

1. (a) What is Space Lattice ?

(b) State Moseley's Law.

(c) What are Phonons ?

(d) What is Critical Magnetic Field ?

(e) Define Magnetic Induction.

(f) Give an example for Hard Magnetic Material.

(g) State Radioactive Decay Law.

(h) Define Half Life of Radioactive Element.

(i) What is Pair Production ?

(j) What is Accelerator ?

SECTION - B

II. Answer **any four** of the following. **4x5=20**

2. Explain the procedure to find miller indices with example.

3. With neat diagram explain construction and working of Bragg's X-ray Spectrometer.

4. With neat diagram explain B-H Curve.

5. State and explain meissner effect.

6. Explain the general properties of Nuclei.

7. Explain Gamma ray interaction through photoelectric effect.

P.T.O.

SECTION - C

III. Answer **any three** of the following. **10x3=30**

8. Derive an expression for Electrical and Thermal Conductivity of metals. **10**

9. Give the necessary theory of Para Magnetic Material. **10**

10. (a) Explain Gamow's Theory of Alpha Decay. **5+5**

(b) With neat diagram explain Binary Energy-Curve.

11. (a) Explain construction and working of G-M Counter. **6+4**

(b) Write a note on semi-conductor detectors.

12. (a) Explain Energy Kinematics of Beta Decay. **5+5**

(b) With neat diagram explain construction and working of synchrotron.

- o 0 o -

No. of Printed Pages : **2**

21BSC6C15ZOL

B.Sc. VI Semester Degree Examination, Sept./Oct. - 2024

ZOOLOGY

DSC 16 : Z.6.2 Environmental Biology, Wild life Management and Conservations

(NEP)

Time : 2 Hours Maximum Marks : 60

Note : *(i) Answer **all** sections.*

(ii) Draw labelled diagram wherever necessary.

SECTION - A

Answer the following sub-questions. **10x1=10**

1. (a) What is Ecology ?

(b) What are Producers ?

(c) Expand CFC.

(d) What do you mean by "Minimata" ?

(e) Mention the Hotspots found in India.

(f) Name any two Endangered species found in Western Ghats.

(g) Define Sanctuaries.

(h) In which state do you find Khaziranga Wild life Sanctuary ?

(i) Define Population.

(j) What is Soil pollution ?

SECTION - B

Answer **any four** of the following questions. **4x5=20**

2. Write a short note on Food Web.

3. Briefly explain the sources, effects and control measures of Water Pollution.

4. Write a short on the effects of Pollution on Animals.

5. Give an account of effect of the climatic changes on fauna.

6. Write a short note on Wild life Protection Act-1972.

7. Explain Mutualism with suitable example.

P.T.O.

SECTION - C

Answer **any three** of the following questions. **3x10=30**

8. Describe the Aquatic Adaptations in Animals with suitable examples.

9. What is Air Pollution ? Explain in detail about the sources, effects and preventive measures of Air Pollution.

10. Write an Explanatory note on Indian Desert.

11. Briefly explain In-situ and Ex-situ conservation. Add a note on Project Tiger.

12. Describe the Commensalism and Parasitism with suitable examples.

- o 0 o -

No. of Printed Pages : **2**

21BSC6C13ZOL

B.Sc. VI Semester Degree Examination, Sept./Oct. - 2024

ZOOLOGY

DSC 5 - Z.6.1 : Evolutionary and Developmental Biology

(NEP)

Time : 2 Hours | Maximum Marks : 60

Note : *(i) Answer **all** sections.*

(ii) Draw labelled diagrams wherever necessary.

SECTION - A

1. Answer the following sub-questions. **10x1=10**

(a) What is Gene frequency ?

(b) What is Genetic Drift ?

(c) What is Extinction ?

(d) What are Fossils ?

(e) What is Polyspermy ? Give example.

(f) Define cleavage.

(g) Expand "AIDS".

(h) Mention the causative agent of Gonorrhoea.

(i) What is the function of Acrosome of Sperm ?

(j) What are Analogous Organs ? Give example.

SECTION - B

Answer **any four** of the following questions. **4x5=20**

2. Briefly explain Mutation Theory of Organic Evolution.

3. Write a note on Sympatric Speciation.

4. Give short note on Embryological Evidences of Evolution.

5. What is Cleavage ? Explain the types of cleavages in development of Frog.

6. Sketch and label the Frogs Egg.

7. Write short notes on Syphilis.

P.T.O.

SECTION - C

Answer **any three** of the following questions. **3x10=30**

8. Explain in detail about the principles of Theory of Natural Selection.

9. Give the detail account of the Morphological evidences of Evolution.

10. Write the differences between Spermatogenesis and Oogenesis.

11. Explain the process of oogenesis with schematic representation.

12. Write an Explanatory note on causative agent, mode of Transmission, Symptoms and Preventive measures of AIDS.

- o 0 o -

No. of Printed Pages : **2**

21BSC6C15BTL

Sl. No.

B.Sc. VI Semester Degree Examination, Sept./Oct. - 2024

BIOTECHNOLOGY

DSC - 15 : Immunology

(NEP)

Time : 2 Hours Maximum Marks : 60

Note : *Answer **all** sections. Draw labelled diagrams wherever necessary.*

SECTION - A

Answer the following sub-questions. **10x1=10**

1. (a) What is cell - mediated Immunity ?

(b) Who proposed clonal Selection Theory ?

(c) Expand TCC.

(d) Name any two types of Epitope.

(e) Define haptens.

(f) Expand FACS.

(g) Define Immune surveillance.

(h) What is Myasthenia gravis ?

(i) What is Toxoids ?

(j) What do you mean by graft rejection ?

SECTION - B

Answer **any four** of the following questions. **4x5=20**

2. Write a short note on T-lymphocytes.

3. Compare and contrast monoclonal and polyclonal antibodies.

4. Explain the principle of Radial Immunodiffusion.

5. Briefly explain about pathogenesis of rheumatoid arthritis.

6. Compare the inflammatory responses in Type II and Type III hypersensitivity reactions.

7. Explain the concept of molecular mimicry in autoimmune disease.

P.T.O.

SECTION - C

Answer **any three** of the following questions. **3x10=30**

8. Explain the second line of body defence mechanism.

9. Discuss the pathways involved in complement activation.

10. Explain the concept of Antibody Specificity.

11. Define autoimmune disorders. Give an examples of systemic autoimmune disorders.

12. Discuss the process and significance of recombinant vaccines.

- o 0 o -

No. of Printed Pages : **2**

21BSC6C15ELL

Sl. No.

B.Sc. VI Semester Degree Examination, Sept./Oct. - 2024

ELECTRONICS

DSC-8 : Instrumentation and Microcontroller

(NEP)

Time : 2 Hours | Maximum Marks : 60

Note : *Answer **all** sections.*

SECTION - A

Answer the following questions. **10x1=10**

1. (a) Expand LVDT.

(b) What is Transducer ?

(c) How many timers in 8051 Microcontroller ?

(d) What is Active Filter ?

(e) What is ADC ?

(f) Expand DPTR.

(g) What is Thermistor ?

(h) What is CMRR ?

(i) Expand the meaning of MOVA, @ RO Instruction.

(j) What is Good Integrator ?

SECTION - B

Answer **any four** questions. **4x5=20**

2. Explain the working of Resistance type temperature sensor.

3. Explain the working of Integrator.

4. Write a note on Arithmetic instructions.

5. What are the salient features of Microcontroller 8051 ?

6. Explain TCON resister.

7. Explain the classification of 128 bytes of RAM.

P.T.O.

SECTION - C

Answer **any three** questions. **3x10=30**

8. What is Optical Pyrometer ? Explain with a neat diagram principle of working.

9. Derive the expression for higher cut-off frequency of active low-pass filter.

10. With a neat block diagram of 8051 Microcontroller architecture, explain its Registers.

11. Explain the addressing modes of Microcontroller 8051.

12. Explain the logical instructions with examples.

13. Write short notes on :

(a) Solid state sensors

(b) PSW Register

- o 0 o -

No. of Printed Pages : **2**

21BSC6C13MAL

B.Sc. VI Semester Degree Examination, Sept./Oct. - 2024

MATHEMATICS

DSC - 7 : Linear Algebra

(NEP)

Time : 2 Hours Maximum Marks : 60

Note : *Answer **all** sections.*

SECTION - A

1. Answer the following sub-questions, each sub-question carries **one** mark. **10x1=10**

(a) Define Vector Subspaces.

(b) Show that the set $S=\{(1, 0, 0), (0, 1, 0), (0, 0, 1)\}$ is Linearly independent in $V_3(R)$.

(c) If $T : V_1(R) \to V_3(R)$ is defined by $T(x)=(x, x^2, x^3)$, verify whether T is Linear or not.

(d) State Rank-Nullity Theorem.

(e) Define homomorphism of a Vector Space.

(f) Define Diagonalization of a Matrix.

(g) What are the conditions for invertibility ?

(h) Define Minimal polynomial of a transformation.

(i) What is inner product in a Vector Spaces ?

(j) Determine if the Vectors $u=(1, 2, -1)$ and $v=(2, -1, 1)$ are Orthogonal.

SECTION - B

Answer **any four** of the following questions, each question carries **five** marks. **4x5=20**

2. Express the Vectors $(2, -1, -8)$ as a linear combination of the Vectors $(1, 2, 1)$, $(1, 1, -1)$ and $(4, 5, -2)$.

3. Define Basis and Dimension of V(F) determine whether the set $\{(1, 2, 3,), (-2, 1, 3), (3, 1, 0)\}$ is a basis of $V_3(R)$.

4. Find the algebraic and geometric multiplicities of Eigenvalues of a linear transformation $A=\begin{pmatrix} 4 & 1 & 0 \\ 0 & 4 & 0 \\ 0 & 0 & 2 \end{pmatrix}$.

5. Determine the linear transformation $T: R^2 \to R^2$ defined by $T\left(\begin{bmatrix} x \\ y \end{bmatrix}\right) = \begin{bmatrix} 2x+y \\ x-y \end{bmatrix}$.

Determine whether T is invertible or not. If so, find the inverse of T.

P.T.O.

6. Show that the function $< -, -> : R^3 \times R^3 \to R$ defined by $<u, v> = \sum_{i=1}^{3} u_i v_i$, where $u = (u_1, u_2, u_3)$ and $v = (v_1, v_2, v_3)$ are Vectors in R^3 is an inner product.

7. Diagonalize the linear transformation $T : R^2 \to R^2$ represented by the Matrix $A = \begin{pmatrix} 3 & 1 \\ 0 & 2 \end{pmatrix}$.

SECTION - C

Answer **any three** of the following questions, each question carries **ten** marks. **3x10=30**

8. (a) The union of two subspaces of a Vector Space V over a field F is a subspace off one is contained in the other.

(b) Prove that (3, −7, 6) is the span of the Vectors (1, −3, 2), (2, 4, 1) and (1, 1, 1).

9. (a) Let $T : V \to W$ be a linear transformation defined by $T(x, y, z) = (x+y, x-y, 2x+z)$. Find Range, null space, Rank, nullity and hence verify Rank-Nullity Theorem.

(b) Find the Matrix of Linear Transformation $T : V_2(R) \to V_3(R)$ defined by $T(x, y) = (2y - x, y, 3y - 3x)$ relative basis $B_1 = \{(1, 1), (-1, 1)\}$ and $B_2 = \{(1, 1, 1), (1, -1, 1) (0, 0, 1)\}$.

10. (a) Find Eigen values and Eigen vectors of a linear transformation $T : R^2 \to R^2$ defined by $A(v) = Av$, where $A = \begin{pmatrix} 2 & 0 \\ 0 & -1 \end{pmatrix}$.

(b) Find the Eigen space of the linear transformation $T : R^2 \to R^2$ represented by the Matrix $A = \begin{pmatrix} 4 & 1 \\ 2 & 3 \end{pmatrix}$.

11. (a) Consider the linear transformation $T : R^2 \to R^2$ defined by $T\left(\begin{bmatrix} x \\ y \end{bmatrix}\right) = \begin{pmatrix} x + 2y \\ 2x + 4y \end{pmatrix}$ Determine whether T is singular or not.

(b) Determine the relationship between the minimal and characterstic polynomials of the linear transformation of $T : R^2 \to R^2$ defined by $T\left(\begin{bmatrix} x \\ y \end{bmatrix}\right) = \begin{bmatrix} 3x - y \\ 2x \end{bmatrix}$.

12. (a) State and prove Cauchy-Schwarz inequality.

(b) Define Orthonormal Basis and determine if the Set of Vectors $u = \left(\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}, 0\right)$ $v = \left(\frac{-1}{\sqrt{2}}, \frac{1}{\sqrt{2}}, 0\right)$ and $w = (0, 0, 1)$ forms an orthonormal basis for R^3.

- o 0 o -

No. of Printed Pages : **2**

21BSC6C13BTL

Sl. No.

B.Sc. VI Semester Degree Examination, Sept./Oct. - 2024

BIOTECHNOLOGY

DSC 13 : Medical Biotechnology

(NEP)

Time : 2 Hours | Maximum Marks : 60

Note : *(i) Answer **all** sections.*

(ii) Draw labelled diagram wherever necessary.

SECTION - A

Answer the following sub-questions. **10x1=10**

1. (a) Expand ELISA.

(b) Name the causative agent of Typhoid.

(c) Who conducted the first controlled clinical trial ?

(d) Expand GCP.

(e) Define Nano biosensors.

(f) What do you mean by Sol-gel process ?

(g) Define adult Stem cell.

(h) What is Radiotherapy ?

(i) What are Cancer Vaccines ?

(j) Define Passive immunization.

SECTION - B

Answer **any four** of the following questions. **4x5=20**

2. Briefly explain about the causal agent, mode of infection, symptoms of Tuberculosis.

3. Describe the various career opportunities available within the field of clinical research.

4. Write a short note on high energy ball milling in Nano biotechnology.

P.T.O.

5. Discuss the applications of stem cells in tissue engineering and regenerative medicine.

6. Explain the mechanisms behind live attenuated vaccines.

7. Give the brief account of the potential advantages of DNA vaccines.

SECTION - C

Answer **any three** of the following questions. **3x10=30**

8. Write an explanatory note on the causative agent, mode of transmission, symptoms and preventive measures of AIDS.

9. Discuss the scope of clinical research and its potential benefits and challenges.

10. Describe the potential applications of nanotechnology in cancer therapy.

11. Analyze the ethical considerations surrounding the use of stem cells in research and clinical practice.

12. How do traditional methods differ from newer approaches in the development of subunit vaccines ?

- o 0 o -

No. of Printed Pages : **3**

21BSC6C15MAL

B.Sc. VI Semester Degree Examination, Sept./Oct. - 2024

MATHEMATICS

DSC-8 : Numerical Analysis

(NEP)

Time : 2 Hours | Maximum Marks : 60

Note : *(i) Answer **all** sections.*

(ii) Non-programmable calculator may be used.

SECTION - A

Answer **all** questions. **10x1=10**

1. (a) Round of 5^{th} digit in the number 0.56355.

(b) Define Relative Error.

(c) What is Iteration method ?

(d) Write Secant method formula.

(e) When we apply Seidal method on the system ?

(f) What we mean by diagonally dominated matrix ?

(g) Prove that $\nabla = \Delta E^{-1}$.

(h) Show that $\Delta - \nabla = \Delta \cdot \nabla$.

(i) Write the formula of Simpson's $\frac{3}{8}^{th}$ rule.

(j) Write the formula of Weddle's rule.

P.T.O.

SECTION - B

Answer **any four**. **4x5=20**

2. If 0.182 is the approximate value of $\frac{2}{11}$, find the absolute Relative and percentage errors.

3. The equation $x^4 - x - 10 = 0$ has one root between 1.8 and 2. Find the root correct to 3 places of decimal by the method of false position.

4. Apply Gauss-Fordon method to solve.
$10x + y + z = 12$
$x + 10y + z = 12$
$x + y + 10z = 12$

5. Find the number of students from the following data who secured marks not more than 45 marks.

Marks	30 - 40	40 - 50	50 - 60	60 - 70	70 - 80
No. of students	35	48	70	40	22

6. Evaluate $\int_0^6 \frac{dx}{1+x^2}$ by using Simpson's $\frac{1}{3}^{rd}$ rule.

7. Using Newton-Rapson method, find the root near 2.9 of the equation $x + \log_{10} x = 3.375$ correct to four significant figures.

SECTION - C

Answer **any three** of the following questions. **3x10=30**

8. (a) Find the number of trustworthy figures in $(0.274)^3$ assuming that the number 0.274 is correct to the last figure. **4**

(b) Evaluate $\tan^{-1}\left[\frac{1}{2}\right]$ correct to six decimal places by using Taylor's expression. Find the number of terms to be retained in the series for this purpose. **6**

9. (a) Find the cube root of 15, correct to 4 significant figures by Iterative method.

(b) Find a real positive root of the equation $x^3 - 7x + 5 = 0$ by Bisection method upto fourth approximation.

10. (a) Solve by Gauss Elimination method of $2x+y+z=10$, $3x+2y+3z=18$; $x+4y+9z=16$.

(b) Apply Jacobi iteration method, to solve $10x+y+z=12$; $2x+10y+z=13$; $2x+2y+10z=14$.

11. (a) Using Newton's divided difference formula. Find the value of $f(18)$ and $f(15)$ from the table.

x	4	5	7	10	11	13
$f(x)$	48	100	294	900	1210	2028

(b) Apply Lagrange's formula to find $f(5)$ given that $f(1)=2$, $f(2)=4$, $f(3)=8$, $f(7)=128$.

12. (a) Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at $x=54$ from the following table.

x	50	51	52	53	54
y	3.684	3.7084	3.7325	3.7563	3.7798

(b) Use Weddle's rule to evaluate $\int_4^{5.2} y_x \, dx$ given that :

x	4.0	4.2	4.4	4.6	4.8	5.0	5.2
y	1.386	1.435	1.482	1.526	1.569	1.6	1.649

- o 0 o -

No. of Printed Pages : **2**

21BSC6C13ELL

Sl. No.

B.Sc. VI Semester Degree Examination, Sept./Oct. - 2024

ELECTRONICS

DSC-13 : Television and Digital Communication System

(NEP)

Time : 2 Hours | Maximum Marks : 60

Note : *Answer* ***all*** *Sections.*

SECTION - A

1. Answer the following : **10x1=10**

(a) What is Synchronization ?

(b) What is Luminance Signal ?

(c) What is SECAM System ?

(d) What is FDMA technique in Satellite System ?

(e) Expand PCM.

(f) What is optical fibre ?

(g) Define Channel.

(h) What are Primary colors ?

(i) What is Raster in TV ?

(j) What is bit recovery time ?

SECTION - B

Answer **any four** questions. **4x5=20**

2. What are TV standards measures ?

3. List the characteristics of Camera Tubes.

4. Describe the interlaced scanning process in TV.

5. What is Digital Communication System ? List the merits of Digital communication system.

6. What are the advantages of Optical Communication System ?

7. Briefly describe the functional characteristics of UP-link model for a Satellite.

P.T.O.

SECTION - C

Answer **any three** questions. **3x10=30**

8. Explain the working of Monochrome TV receiver with neat block diagram.

9. With neat block diagram of Satellite Communication System, explain each block.

10. What is Base Band Transmission, explain Synchronous Transmission System ?

11. Explain with neat block diagram optical communication system.

12. With neat block diagram explain color TV receiver.

13. Write a note on :
(a) Internet
(b) Pulse Amplitude modulation

- o O o -

No. of Printed Pages : **2**

21BSC6C13CSL

B.Sc. VI Semester Degree Examination, Sept./Oct. - 2024

COMPUTER SCIENCE

DSC 13 : Web Technology

(NEP)

Time : 2 Hours Maximum Marks : 60

SECTION - A

I. Answer **all** the following sub-questions : **10x1=10**

1. (a) What is Internet ?

(b) Expand the following :
(i) URL (ii) XHTML

(c) Name any two font properties used in HTML.

(d) Define XML Tree.

(e) List down any 2 - 2D transformation methods.

(f) What is the use of XML Passer ?

(g) Who developed JavaScript ?

(h) Define an event in JavaScript.

(i) What is the need of Session Cookies ?

(j) Name the Java API used to connect Database and execute queries.

SECTION - B

II. Answer **any four** of the following : **4x5=20**

2. Write the structure of a HTML program with an example.

3. Explain <img> and <a> tags with syntax and examples.

4. Discuss the CSS text fonts in detail.

5. Write a note on CSS Animation.

6. What is an array ? How to create arrays in JavaScript ?

7. Briefly discuss the advantages of Servlets over CGT Programming.

SECTION - C

III. Answer **any three** of the following : **3x10=30**

8. Explain <Table> Tag and its attributes with simple example.

9. With a suitable example explain the different types of lists in HTML.

10. Write a note on the following :
(i) CSS Box Modelling
(ii) CSS gradients

11. Explain the different types of CSS selector forms.

12. Explain different types of conditional and looping statements in JavaScripting.

- o 0 o -