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G—286—2015

FACULTY OF SCIENCE

B.Sc. (Third Year) (Sixth Semester) EXAMINATION

MARCH/APRIL, 2015

MICROBIOLOGY

Paper XV

(Industrial Microbiology)

(Wednesday, 8-4-2015) Time : 10.00 a.m. to 12.00 noon

Time—Two Hours *Maximum Marks*—40

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) *All* questions carry equal marks.

(*iii*) Illustrate your answer with suitable diagrams.

1. Attempt any *four* : 4×2

(*i*) What is Horton sphere ?

(*ii*) Enlist methods of stock culture maintenance.

P.T.O.

(*iii*) What are antifoam agents ? Give *two* examples.

(*iv*) What is downstream process ? Enlist *four* methods used in this process.

(*v*) Which organism is used as legume inoculant ?

(*vi*) Write down uses of proteases.

2. Answer the following (any *two*) : 2×4

(*i*) Write briefly on fluidised bed reactor.

(*ii*) Describe crowded plate technique.

(*iii*) Discuss the role of microbiologist in Industrial Microbiology.

3. Answer the following (any *two*) : 2×4

(*i*) Write on coagulation and flocculation.

(*ii*) Discuss the role of biotin in L-glutamic acid production.

(*iii*) Describe wine production.

4. Answer any *one* of the following : 8

(*i*) Describe the design of 'Ideal fermentor'.

(*ii*) Discuss citric acid production.

5. Write short notes on any *two* : 2×4

(*i*) Batch Fermentation

(*ii*) Molasses

(*iii*) Liquid extraction

(*iv*) Thuricide.

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G—286—2015

FACULTY OF SCIENCE

B.Sc. (Third Year) (Sixth Semester) EXAMINATION

MARCH/APRIL, 2015

MICROBIOLOGY

Paper XV

(Industrial Microbiology)

(Wednesday, 8-4-2015) Time : 10.00 a.m. to 12.00 noon

Time—Two Hours *Maximum Marks*—40

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) *All* questions carry equal marks.

(*iii*) Illustrate your answer with suitable diagrams.

1. Attempt any *four* : 4×2

(*i*) What is Horton sphere ?

(*ii*) Enlist methods of stock culture maintenance.

P.T.O.

(*iii*) What are antifoam agents ? Give *two* examples.

(*iv*) What is downstream process ? Enlist *four* methods used in this process.

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2. Answer the following (any *two*) : 2×4

(*i*) Write briefly on fluidised bed reactor.

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(*iii*) Describe wine production.

4. Answer any *one* of the following : 8

(*i*) Describe the design of 'Ideal fermentor'.

(*ii*) Discuss citric acid production.

5. Write short notes on any *two* : 2×4

(*i*) Batch Fermentation

(*ii*) Molasses

(*iii*) Liquid extraction

(*iv*) Thuricide.

This question paper contains 3 printed pages]

G—283—2015

FACULTY OF SCIENCE

B.Sc. (Theory Pattern) (Sixth Semester) EXAMINATION

MARCH/APRIL, 2015

MICROBIOLOGY

Paper XIV

(Molecular Biology)

(Tuesday, 7-4-2015) Time : 10.00 a.m. to 12.00 noon

Time—2 *Hours* *Maximum Marks*—40

N.B. :— (*i*) Attempt *All* questions.

(*ii*) *All* questions carry equal marks.

(*iii*) Represent your answers with suitable diagrams wherever necessary.

1. Define (any *four*) : 8

(*i*) Tautomerism

(*ii*) Depurination

P.T.O.

(*iii*) Genetic code

(*iv*) Termination codons

(*v*) Operon

(*vi*) Cloning.

2. Write short notes on (any *two*) : 8

(*i*) Nucleotide Excision Repair

(*ii*) Deamination

(*iii*) Degeneracy of Code.

3. Write on (any *two*) : 8

(*i*) Leader polypetide of trp operon

(*ii*) $CaCl_2$ Transformation

(*iii*) Colony hybridization.

4. Describe (any *one*) : 8

(*i*) Initiation of Translation

(*ii*) Chemical mutagenic agents.

5. Write short notes on (any *two*) : 8

(*i*) Photoreactivation

(*ii*) Charging of *t*-RNA

(*iii*) Structural genes of Lac Operon

(*iv*) Cosmid.

This question paper contains 3 printed pages]

G—286—2015

FACULTY OF SCIENCE

B.Sc. (Third Year) (Sixth Semester) EXAMINATION

MARCH/APRIL, 2015

MICROBIOLOGY

Paper XV

(Industrial Microbiology)

(Wednesday, 8-4-2015) Time : 10.00 a.m. to 12.00 noon

Time—Two Hours *Maximum Marks*—40

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) *All* questions carry equal marks.

(*iii*) Illustrate your answer with suitable diagrams.

1. Attempt any *four* : 4×2

(*i*) What is Horton sphere ?

(*ii*) Enlist methods of stock culture maintenance.

P.T.O.

(*iii*) What are antifoam agents ? Give *two* examples.

(*iv*) What is downstream process ? Enlist *four* methods used in this process.

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2. Answer the following (any *two*) : 2×4

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(*iii*) Describe wine production.

4. Answer any *one* of the following : 8

(*i*) Describe the design of 'Ideal fermentor'.

(*ii*) Discuss citric acid production.

5. Write short notes on any *two* : 2×4

(*i*) Batch Fermentation

(*ii*) Molasses

(*iii*) Liquid extraction

(*iv*) Thuricide.

This question paper contains 4+1 printed pages]

G—288—2015

FACULTY OF ARTS/SCIENCE

B.A./B.Sc. (Third Year) (Sixth Semester) EXAMINATION

MARCH/APRIL, 2015

MATHEMATICS

Paper XVI (MT-304)

(Numerical Analysis)

(Thursday, 9-4-2015) Time : 10.00 a.m. to 12.00 noon

Time—Two Hours *Maximum Marks*—40

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) Figures to the right indicate full marks.

(*iii*) Use of non-scientific/non-programmable calculator is allowed.

P.T.O.

1. Attempt any *five* of the following : 2 each

(*a*) Prove that $\Delta(cf(x)) = c\Delta f(x)$, where c is a constant.

(*b*) Define interpolation and extrapolation.

(*c*) Construct divided difference table for the following data :

x	$y = f(x)$
4	48
5	100
7	294

(*d*) Define Central difference operators δ and μ.

(*e*) State General Quadrature formula for equidistant ordinate.

(*f*) Define one point and two point boundary conditions satisfied by solution of differential equations.

2. Attempt any *two* of the following : 5 each

(*a*) Prove that Newton-Gregory formula for forward interpolation using polynomial in x of degree n

$$P_n(x) = A_0 + A_1(x - a) + A_2(x - a)(x - a - h) + A_3(x - a)(x - a - h)(x - a - 2h) + \ldots\ldots + A_n(x - a)(x - a - h)\ldots\ldots(x - a - \overline{n-1}h)$$

(*b*) Prove that :

$$e^x = \left(\frac{\Delta^2}{E}\right)e^x \cdot \frac{Ee^x}{\Delta^2 e^x}.$$

(*c*) Find the missing term in the following table :

x	y
0	1
1	3
2	9
3	X
4	81

P.T.O.

3. Attempt any *two* of the following : 5 each

(*a*) Prove that the nth divided difference can be expressed as the quotient of two determinates, each of order $n + 1$.

(*b*) Given $\log_{10}654 = 2.8156$, $\log_{10}658 = 2.8182$, $\log_{10}659 = 2.8189$, $\log_{10}661 = 2.8202$, Find $\log_{10}656$ using Lagrange's formula for unequal intervals.

(*c*) Find the value of y when $x = 3.75$ by using Guass's forward formula, the following table is given :

x	y_x
2.5	24.145
3.0	22.043
3.5	20.225
4.0	18.664
4.5	17.262
5.0	16.047

4. Attempt any *two* of the following : 5 each

(*a*) Prove the Weddle's rule as approximate quadrature formula.

(*b*) Calculate by Trapezoidal rule an approximate value of $\int_{-3}^{3} x^4 dx$ by taking seven equidistant ordinates.

(*c*) Given $\frac{dy}{dx} = \frac{y - x}{y + x} = f(x, y)$ with $y = 1$ when $x = 0$. Find approaximately the value of y for $x = 0.1$ by Picard's method (upto second approximation only).

This question paper contains 4 printed pages]

G—290—2015

FACULTY OF ARTS/SCIENCE

B.A./B.Sc. (Third Year) (Sixth Semester) EXAMINATION

MARCH/APRIL, 2015

MATHEMATICS

Paper XVII (MT-305)

(Partial Differential Equations)

(Friday, 10-4-2015) Time : 10.00 a.m. to 12.00 noon

Time—Two Hours *Maximum Marks—40*

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) Figures to the right indicate full marks.

1. Attempt any *five* of the following : 2 each

(*a*) Form the partial differential equation by eliminating arbitrary function from $Z = f(x^2 - y^2)$.

P.T.O.

(b) Solve the Partial differential equation $yq - xp = z$ where

$$p = \frac{\partial z}{\partial x}, q = \frac{\partial z}{\partial y}.$$

(c) Solve the Partial differential equation $\sqrt{p} + \sqrt{q} = 1$ where

$$p = \frac{\partial z}{\partial x}, q = \frac{\partial z}{\partial y}.$$

(d) Solve the equation :

$$\frac{\partial^2 z}{\partial x^2} + 4\frac{\partial^2 z}{\partial x \partial y} - 5\frac{\partial^2 z}{\partial y^2} = 0.$$

(e) State wave equation and one-dimensional heat flow equation.

(f) Write two methods for solving wave equation

$$\frac{\partial^2 y}{\partial t^2} = c^2 \frac{\partial^2 y}{\partial x^2}.$$

2. Attempt any *two* of the following : 5 each

(a) Discuss the method to solve Lagrange's linear equation of the type $Pp + Qq = R$ where P, Q, R are functions of x, y, z and $p = \frac{\partial z}{\partial x}, q = \frac{\partial z}{\partial y}$.

(*b*) Solve the Partial differential equation

$$(mz - ny)\frac{\partial z}{\partial x} + (nx - lz)\frac{\partial z}{\partial y} = ly - mx .$$

(*c*) Solve :

$$\frac{\partial^2 z}{\partial x \partial y} = \frac{y}{x} + 2 .$$

3. Attempt any *two* of the following : 5 each

(*a*) Explain the method to solve the equation of the type

$$f_1(x, p) = f_2(y, q)$$

where $p = \frac{\partial z}{\partial x}, q = \frac{\partial z}{\partial y}$.

(*b*) Explain Monge's method to solve the non-linear equation of second order

$$Rr + Ss + Tt = V$$

where R, S, T, V are functions of x, y, z, p and q, $r = \frac{\partial^2 f}{\partial x^2}$, $s = \frac{\partial^2 f}{\partial x \partial y}, t = \frac{\partial^2 f}{\partial y^2}$.

(c) Solve :

$$\frac{\partial^3 z}{\partial x^3} - 3\frac{\partial^3 z}{\partial x^2 \partial y} + 4\frac{\partial^3 z}{\partial y^3} = e^{x+2y}$$

4. Attempt any *two* of the following : 5 each

(a) Solve Laplace equation in Polar co-ordinates

$$\frac{\partial^2 u}{\partial r^2} + \frac{1}{r}\frac{\partial u}{\partial r} + \frac{1}{r^2}\frac{\partial^2 u}{\partial \theta^2} = 0$$

by the method of separation of variables.

(b) Solve $\frac{\partial u}{\partial x} + u = \frac{\partial u}{\partial t}$ if $u = 4e^{-3x}$ when $t = 0$ by the method of separation of variables.

(c) Obtain the solution of the wave equation

$$\frac{\partial^2 y}{\partial t^2} = c^2 \frac{\partial^2 y}{\partial x^2}$$

using the method of separation of variables.

This question paper contains 8 printed pages]

G—291/292—2015

FACULTY OF ARTS/SCIENCE

B.A./B.Sc. (Third Year) (Sixth Semester) EXAMINATION

APRIL/MAY, 2015

MATHEMATICS

Paper XVIII (306-A) : (Topology)

Paper XVIII (306-B) : [Mechanics—II (Dynamics)]

(Saturday, 11-4-2015) **Time : 10.00 a.m. to 12.00 noon**

Time—Two Hours *Maximum Marks*—40

Paper XVIII (306-A)

(Topology)

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) Figures to the right indicate full marks.

1. Attempt any *five* of the following : 2 each

(*a*) Define well ordered sets.

P.T.O.

(*b*) Define discrete topology.

(*c*) Define basis for a topology.

(*d*) Let Y be a subspace of X. If U is open in Y and Y is open in X, then show that U is open in X.

(*e*) Define Hausdorff space.

(*f*) Define connected space.

2. Attempt any *two* of the following : 5 each

(*a*) Show that two equivalence classes E and E′ are either disjoint or equal.

(*b*) Let X be a set, **B** be a basis for a topology **T** on X. Then show that **T** equals the collection of all union of elements of **B**.

(*c*) Let X be a set, $\mathbf{T}_f$ be the collection of all subsets U of X, such that X-U either is finite or is all of X. Then show $\mathbf{T}_f$ is a topology on X.

3. Attempt any *two* of the following : 5 each

(*a*) If A is a subspace of X and B is a subspace of Y, then prove that the product topology on A × B is the same as the topology A × B inherits as a subspace of X × Y.

(*b*) Prove that, the collection :

$$S = \left\{\Pi_1^{-1}(U) \mid U \text{ open in } X\right\} \cup \left\{\Pi_2^{-1}(V) \mid V \text{ open in } Y\right\}$$

is a sub-basis for the product topology on X × Y.

(*c*) Let Y be a subspace of X, if U is open in Y and Y is open in X, then show that U is open in X.

4. Attempt any *two* of the following : 5 each

(*a*) Let A be a subset of the topological space X. Let A′ be the set of all limit points of A. Then prove that :

$$\bar{A} = A \cup A'.$$

(b) Let $X = A \cup B$, where A and B are closed in X, let :

$$f : A \to Y \text{ and } g : B \to Y$$

be continuous, if

$$f(x) = g(x)$$

for every $x \in A \cap B$, then prove that f and g combine to give a continuous function

$$h : X \to Y,$$

defined by setting :

$$h(x) = f(x), \text{ if } x \in A \text{ and}$$

$$h(x) = f(x), \text{ if } x \in B.$$

(c) Show that a function

$$f : R \to R$$

given by

$$f(x) = 3x + 1$$

is a homomorphism.

OR

Paper XVIII (306-B)

[Mechanics—II (Dynamics)]

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) Figures to the right indicate full marks.

1. Attempt any *five* of the following : 2 each

(*a*) **Define curvature of a curve.**

(*b*) Write the components of velocity along rectangular Cartesian axes.

(*c*) Define potential function of the conservative field of force.

(*d*) Write the unit of mass.

(*e*) Define projectile.

(*f*) Define horizontal range of projectile.

2. Attempt any *two* of the following : 5 each

(*a*) Find the radial and transverse components of velocity.

(*b*) Find the expressions for velocity and acceleration in terms of vector derivatives.

(*c*) Prove that if the tangential and normal accelerations of a particle describing a plane curve be constant throughout the motion, the angle ψ through which the direction of motion turns in time t is given by :

$$\psi = A \log(1 + Bt).$$

3. Attempt any *two* of the following : 5 each

(*a*) Prove that necessary and sufficient condition for a force F to be conservative is that the line integral over a closed path C in a conservative field is zero, that is :

$$\int_C \vec{F}.d\vec{r} = 0.$$

(*b*) Prove that the sum of the work done by any number of forces is equal to the work done by their resultant.

(*c*) A particle of mass 0.1 *lb* has the velocity $2i + 3j$ ft/sec at $t = 2$ sec. It is subjected to a force

$$3t^2 \, i + \cos(\pi t) \, j.$$

Find the impulse of the force over the interval

$$2 \leq t \leq 3.$$

Also find the velocity at $t = 3$ sec.

4. Attempt any *two* of the following : 5 each

(*a*) Find the condition of projectile to pass through a given point (h, k).

(*b*) Find the Cartesian equation of the path of a projectile.

(c) If the greatest heights attained by two particles are h_1 and h_2, then prove that the angle of projection is given by :

$$\alpha = \tan^{-1}\left[\sqrt{\frac{h_1}{h_2}}\right]$$

and also prove that $u^2/4g$ is the arithmetic mean between h_1 and h_2 and R|4 is the geometric mean between them, where R is the horizontal range.

This question paper contains 7 printed pages]

G—297/298—2015

FACULTY OF SCIENCE

B.Sc. (Sixth Semester) EXAMINATION

MARCH/APRIL, 2015

PHYSICS

Paper XV

(A : Digital and Communication Electronics)

Or

(B : Solar Energy)

(Friday, 17-4-2015) **Time : 10.00 a.m. to 12.00 noon**

Time—Two Hours *Maximum Marks*—40

(A : Digital and Communication Electronics)

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) Figures to the right indicate full marks.

P.T.O.

1. Solve any *four* from the following : 8

(*a*) What weight does the digit 5 have in each of the following octal numbers ?

(*i*) 75.898

(*ii*) 7051.

(*b*) Define amplitude modulation.

(*c*) When is the output of an OR gate low ?

(*d*) Draw and label the block diagram of Tuned Radio Frequency (TRF) Receivers.

(*e*) Convert the Hexadecimal number A85 to a decimal number.

(*f*) Develop the truth table for a two-input NAND gate.

(*g*) Write the mathematical expression for modulation index.

(*h*) Explain the function of RF section of a superheterodyne receiver.

2. Solve any *two* : 8

(*a*) Add the following BCD numbers :

(*i*)
$$\begin{array}{r} 1\ 0\ 0\ 1 \\ +\ 0\ 1\ 0\ 0 \\ \hline \end{array}$$

(*ii*)
$$\begin{array}{r} 0\ 0\ 1\ 0 \qquad 0\ 0\ 1\ 1 \\ +\ 0\ 0\ 0\ 1 \qquad 0\ 1\ 0\ 1 \\ \hline \end{array}$$

(*b*) Apply De Morgan's theorems to an expression :

$$\overline{\left(\overline{\overline{A} + B}\right) + \overline{CD}}.$$

(*c*) (*i*) Convert the decimal number :

159 to Excess-3 code

(*ii*) State the distributive law of addition in Boolean algebra for three variables A, B and C.

3. Attempt any *one* : 8

(*a*) Define and explain frequency modulation with corresponding waveforms. Obtain an expression for frequency modulated wave.

(*b*) Explain and obtain an expression for amplitude modulation with waveforms.

P.T.O.

4. Explain in detail any *one* of the following : 8

(*a*) Orbitting satellites

(*b*) Communication satellite systems.

5. Attempt the following : 8

(*a*) (*i*) Universal properteis of the NOR gate.

Or

(*ii*) Logical operation of the EX-OR gate.

(*b*) Using rules and laws of Boolean algebra solve the following function :

(*i*) $X = \overline{ABC} + \overline{(\overline{D} + E)}$

Or

(*ii*) (A + B) (A + C).

OR

(B : Solar Energy)

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) Figures to the right indicate full marks.

1. Attempt any *four* : 8

(*a*) Explain the working principle of a mirror strip reflector.

(*b*) What is the difference between non-concentrating and concentrating type solar collector ?

(*c*) Draw the schematic diagram of natural circulation solar water heater (pressurised) system.

(*d*) Enlist different parameters affecting biodigestion or gas generation.

(*e*) What are the advantages of fixed dome type plant of biogas production ?

(*f*) What are the main types of fuel cells ? Also write the main components of a fuel cell.

2. Attempt any *two* : 8

(*a*) What do you mean by beam and diffuse radiation ? Explain in brief about solar radiation at the Earth's surface.

(*b*) Explain the principle of conversion of solar energy into heat.

(*c*) Describe the design principle and constructional details of a Box-type solar cooker.

3. Attempt any *two* : 8

(*a*) With the help of a schematic diagram for a central tower receiver. Explain how solar energy is converted into electrical energy.

(*b*) Describe wet processes used for generation of Biogas.

(*c*) Write a short note on porous and non-porous electrode.

4. Attempt any *one* : 8

(*a*) Describe the design and principle of operation of a fuel cell (H_2, O_2 Cell).

(*b*) Explain the working principle and operation of a solar distillation.

5. Write short notes on any *two* : 8

(*a*) Applications of fuel cell

(*b*) Dry process

(*c*) Direct method for the production of hydrogen

(*d*) Fresnel lens collector.

This question paper contains 3 printed pages]

G—295—2015

FACULTY OF SCIENCE

B.Sc. (Third Year) (Sixth Semester) EXAMINATION

MARCH/APRIL, 2015

PHYSICS

Paper XIV (Phy-304)

(Atomic, Molecular and Nuclear Physics)

(Thursday, 16-4-2015) **Time : 10.00 a.m. to 12.00 noon**

Time—Two Hours *Maximum Marks*—40

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) Figures to the right indicate full marks.

1. Attempt any *four* :

(*a*) State the characteristics of Raman Lines. 2

(*b*) State Pauli's exclusion principle. 2

(*c*) What is meant by nuclear fission ? 2

(*d*) State the law of conservation of momentum. 2

(*e*) State Raman effect. 2

(*f*) Explain with example elastic scattering. 2

P.T.O.

2. (*a*) Explain the concept of spatial quantization in vector atom model. 4

(*b*) Explain in detail L-S coupling. 4

Or

(*x*) Describe the theory of pure-rotational spectra. 4

(*y*) Derive the relation for Zeeman shift. 4

3. (*a*) Explain the following nuclear reaction : 4

(*i*) Spontaneous decay

(*ii*) Spallation Reactions.

(*b*) Derive the relation for the Q-value of nuclear reaction. 4

Or

(*x*) State any *two* conservation laws of nuclear reaction. 4

(*y*) Write a note on energy release in fission. 4

4. Explain quantum numbers associated with vector atom model. 8

Or

State and explain with a neat diagram Stark effect. 8

5. Write notes on any *two* : 8

(*a*) L-S coupling

(*b*) Nuclear fission as a source of energy

(*c*) Anomalous Zeeman effect

(*d*) Theory of rotation-vibration spectra.

This question paper contains 4+2 printed pages]

G—293—2015

FACULTY OF SCIENCE

B.Sc. (Third Year) (Sixth Semester) EXAMINATION

MARCH/APRIL, 2015

CHEMISTRY

Paper XIV

(Organic and Inorganic Chemistry)

(Monday, 13-4-2015) **Time : 10.00 a.m. to 12.00 noon**

Time—Two Hours *Maximum Marks—40*

N.B. :— (*i*) Attempt *All* questions.

(*ii*) Use separate answer-book for Section A and Section B.

(*iii*) Figures to the right indicate full marks.

Section A

(Organic Chemistry)

1. Answer any *five* of the following : 5×2=10

(*a*) Define and give the examples of :

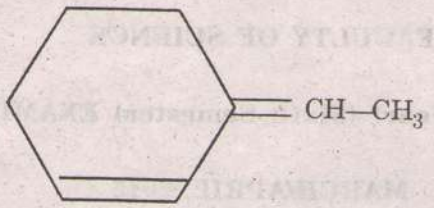
(*i*) Chromophore

(*ii*) Auxochrome.

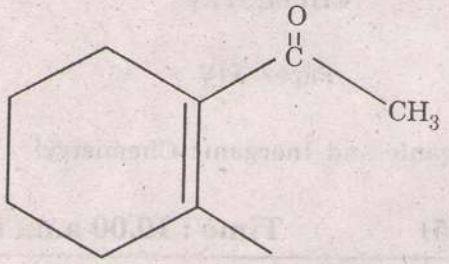
P.T.O.

(*b*) What 'λ_{max}' value do you expect for :

(*i*)



(*ii*)



(*c*) Explain chemical shift. What are the scales used for its measurement ? How are they related ?

(*d*) How many signals do you expect in the PMR spectrum of ethylamine ? Predict the splitting pattern of each signal.

(*e*) Using benzyl alcohol as the C-protecting agent, offer the synthesis of a dipeptide.

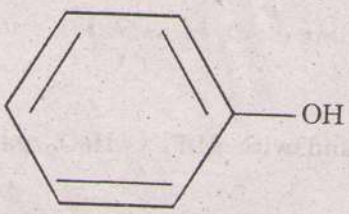
(*f*) Give any *two* colour tests for the detection of proteins.

(*g*) Explain dipolar nature of amino acids.

2. Answer any *two* of the following : 2×5=10

(*a*) Describe the various molecular vibrations in IR spectroscopy. Give characteristic IR absorption bands for the following :

(*i*) $CH_2 = CH_2$

(*ii*) 

(*b*) Describe Baeyer-Villiger rearrangement with mechanism.

(*c*) How is glycine prepared by Gabriel's phthalimide synthesis ? What is the action of the following reagents on it :

(*i*) NaOH

(*ii*) $LiAlH_4$?

3. Answer any *one* of the following : 1×7=7

(*a*) Discuss free radical addition polymerisation with mechanism.

Give synthesis and uses of :

(*i*) Neoprene

(*ii*) Glyptol.

(*b*) An organic compound with M.F. $C_4H_8O_2$ gave the following spectral data :

UV : λ_{max} 211 nm. (ϵ_{max} 57)

IR : 2983 cm^{-1}, 1743 cm^{-1}, 1243 cm^{-1}

PMR (δ_{ppm}) : $\delta_{4.12}$(*q*, J7.1 Hz, 2H)

$\delta_{1.26}$(*t*, J7.1 Hz, 3H)

$\delta_{2.04}$(S, 3H)

Deduce the structure of the compound.

Section B

(Inorganic Chemistry)

4. Solve any *three* of the following : 3×3=9

(*a*) Why is octahedral field splitting energy Δ_0 always higher than tetrahedral field splitting energy ?

(*b*) Give the limitations of CFT.

(*c*) Define outer orbital complexes. Explain with $[FeF_6]^{3-}$ as an example.

(*d*) What are Orgel diagram ? Draw combined Orgel diagram for d^1 and d^9 octahedral complexes.

(*e*) State and explain spectrochemical series.

5. Solve any *two* of the following : 2×2=4

(*a*) Explain $[Ti(H_2O)_6]^{3+}$ is purple in colour.

(*b*) Distinguish between VBT and CFT.

(*c*) Why is $[CoF_6]^{3-}$ paramagnetic ? Explain.

(*d*) Calculate the CFSE value of d^4 and d^5 system in high spin octahedral complexes.

This question paper contains 4 printed pages]

G—294—2015

FACULTY OF SCIENCE

B.Sc. (Third Year) (Sixth Semester) EXAMINATION

MARCH/APRIL, 2015

CHEMISTRY

Paper XV (CH-304)

(Physical Chemistry and Inorganic Chemistry)

(Wednesday, 15-4-2015) Time : 10.00 a.m. to 12.00 noon

Time—Two Hours *Maximum Marks*—40

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) Use of calculator is allowed.

(*iii*) Use separate answer-sheet for each Section.

Section A

(Physical Chemistry)

1. Answer any *five* of the following : 5×2=10

(*a*) What are indicator electrodes ? Give examples.

P.T.O.

(*b*) State and explain Nernst heat theorem.

(*c*) Define work function and show that decrease in work function ($-\Delta A$) is equal to maximum work.

(*d*) Derive Gibbs-Duhem equation.

(*e*) What are paramagnetic substances ? Give examples.

(*f*) Define magnetic susceptibility and give its unit.

(*g*) What is potential of a half-cell consisting of zinc electrode in 0.01 M $ZnSO_4$ solution at 25°C. E° = 0.76 V.

2. Answer any *two* of the following : 2×5=10

(*a*) Describe Gouy's method for the determination of magnetic susceptibility of a substance.

(*b*) Derive the relation between EMF and free energy and EMF and entropy.

(*c*) (*i*) Derive integrated form of Van't Hoff isochore from Van't Hoff equation.

(*ii*) Equilibrium constant for the reaction

$$2NH_3(g) \rightleftharpoons 3H_2(g) + N_2(g)$$

is 1.5×10^{-3} at 300 K and 3×10^{-2} at 400 K.

Calculate ΔH° for the reaction.

($R = 1.987$ $calK^{-1}mol^{-1}$)

3. Answer any *one* of the following : 1×7=7

(*a*) Derive Clausius-Clayperon equation for L $\rightleftharpoons$ V equilibria with its integrated form. Give its applications.

(*b*) What are concentration cells ? Derive the equation for the EMF of the cell with transport.

Section B

(Inorganic Chemistry)

4. Solve any *three* of the following : 3×3=9

(*a*) Discuss the role of haemoglobin in living system.

(*b*) Give the biological importance of sodium ion.

(*c*) Write the different methods of preparation of diborane (B_2H_6).

(*d*) What are carboranes ? How are they classified ?

(*e*) What are metallocarboranes ? How are they prepared ?

5. Solve any *two* of the following : 2×2=4

(*a*) What are metalloporphyrin ? Draw the structure of metalloporphyrin.

(*b*) Draw the structure of 1,7 and 1,12 isomers of dicarbaclosododeca carboranes.

(*c*) What is the action of heat and ammonia on diborane ?

(*d*) Give the IUPAC name of the following boranes :

(*i*) B_5H_{11}

(*ii*) B_9H_{15}

(*iii*) $B_{10}H_{14}$

(*iv*) B_4H_{10}.

This question paper contains 3 printed pages]

G—296—2015

FACULTY OF SCIENCE

B.Sc. (Third Year) (Sixth Semester) EXAMINATION

MARCH/APRIL, 2015

ZOOLOGY

Paper XIV

(Ethology, Biometry and Bioinformatics)

(Thursday, 16-4-2015) **Time : 10.00 a.m. to 12.00 noon**

Time—Two Hours *Maximum Marks*—40

N.B. :— (*i*) Attempt *All* questions.

(*ii*) Illustrate your answer with suitable diagram wherever necessary.

1. Write short notes on any *four* : 8

(*a*) Conditioning

(*b*) Instincts

(*c*) Mode

P.T.O.

(*d*) Secondary data

(*e*) Internet

(*f*) Pie Diagram.

2. Write notes on any *two* : 8

(*a*) Taxis behaviour

(*b*) Imprinting

(*c*) Round dance of Honeybee

(*d*) Habituation.

3. Write notes on any *two* : 8

(*a*) Chemical communication

(*b*) Aggressive mimicry

(*c*) Protective Colouration

(*d*) Tactile Communication.

4. Write notes on any *two* : 8

(*a*) Mean

(*b*) Quantitative data

(c) Standard Deviation

(d) Polygon frequency curve.

5. Describe in detail any *one* of the following : 8

(a) Applications of Bioinformatics.

(b) Internet and its uses in biology.

This question paper contains 8+3 printed pages]

G—299—2015

FACULTY OF SCIENCE

B.Sc. (Third Year) (Sixth Semester) EXAMINATION

MARCH/APRIL, 2015

(Revised Course)

ZOOLOGY

Paper XV (A) : (Pisciculture)

Or

Paper XV (B) : (Applied Parasitology—II)

(Parasitic Nematodes and Arthropoda)

Or

Paper XV (C) : (Applied Zoology) (Entomology—II)

Or

Paper XV (D) : (Environmental Biology—II)

(Friday, 17-4-2015) **Time : 10.00 a.m. to 12.00 noon**

Time—Two Hours *Maximum Marks*—40

Paper XV (A)

(Pisciculture)

N.B. :—(*i*) Attempt *All* questions.

(*ii*) Draw well labelled diagrams wherever necessary.

P.T.O.

1. Write notes on any *four* of the following : 8

(*a*) Soil type

(*b*) *Cirrhinus mrigala*

(*c*) Historical background of induced breeding

(*d*) Basket trap

(*e*) Fish smoking

(*f*) Acidiosis and Alkalosis.

2. Write notes on any *two* of the following : 8

(*a*) Topography and water supply

(*b*) Eradication of aquatic weeds and aquatic insects of nursery ponds

(*c*) Liming and fertilization of stocking ponds

(*d*) Supplementary feeding and harvesting of fish seed from rearing ponds.

3. Write notes on any *two* of the following : 8

(*a*) Biology of *Cyprinus carpio*

(*b*) Striping method of induced breeding

(*c*) Chinese hatcheries

(*d*) Fish seed collection from reverine resources.

4. Write notes on any *two* of the following : 8

(*a*) Cast net and Drag net

(*b*) Masula and Catamaron

(*c*) White spot disease

(*d*) Gyrodactylosis.

5. Attempt any *one* of the following : 8

(*a*) Explain the causes of fish spoilage. Add notes on fish freezing, drying and salting.

(*b*) Give an account on fish food, fish meal, fish liver oil, fish body oil, fish manuring and fertilizers.

OR

Paper XV (B)

(Applied Parasitology—II)

(Parasitic Nematodes and Arthropoda)

N.B. :— (*i*) Attempt *All* questions.

(*ii*) *All* questions carry equal marks.

(*iii*) Draw suitable diagrams wherever necessary.

1. Write notes on any *four* of the following : 8

(*a*) Aphasmedia

(*b*) Dracunculosis

(*c*) Control measures of mites

(*d*) Pathogenicity of anupleura

(*e*) Ancylostomiasis

(*f*) Chikungunia.

2. Write notes on any *two* of the following : 8

(*a*) General organization of parasitic nematodes

(*b*) Life-cycle of Enterobius vermicularies

(*c*) Morphology of Ancylostoma duodenale

(*d*) Larval forms in nematodes.

3. Write notes on any *two* of the following : 8

(*a*) Morphology of Wucheraria bancrofti

(*b*) Life-cycle of Dracunculus medinensis

(*c*) Morphology of Trichinella spiralis

(*d*) Parasitic adaptations in Nematodes.

4. Write notes on any *two* of the following : 8

(*a*) Morphology of ticks

(*b*) Morphology and control measures of Cimex-lacturalis

(c) Mosquito as a vector in the transmission of elephantiasis

(d) Horseflies.

5. Write long answer of any *one* of the following : 8

(a) Explain the chemical control of insects.

(b) Describe the morphology, pathogenicity and control measures of hymenoptera.

OR

Paper XV (C)

(Applied Zoology)

(Entomology—II)

N.B. :— (*i*) Attempt *All* questions.

(*ii*) *All* questions carry equal marks.

(*iii*) Draw well labelled diagrams wherever necessary.

1. Write notes on any *four* of the following : 8

(a) What is Pest ?

(*b*) House fly

(*c*) Rat

(*d*) Silkworm

(*e*) IPM

(*f*) Fumigant.

2. Attempt any *two* of the following : 8

(*a*) Explain the classification, life history and control measures of sugarcane *Pyrilla*.

(*b*) Explain the classification, life history and control measures of Cotton *spotted boll worm*.

(*c*) Explain the classification, life history and control measures of *Jowar stem borer*.

(*d*) Explain the classification, life history and control measures of *Lemon butterfly*.

3. Attempt any *two* of the following : 8

(*a*) Explain the structure, life history and control of House fly.

(*b*) Explain the structure, life history and control of Mosquito.

(*c*) Write a note on Rat and their control.

(*d*) Write a note on Pig and their control.

4. Write notes on any *two* of the following : 8

(*a*) Silkworm and silk

(*b*) Honey and its uses

(*c*) Lac insect and lac-culture

(*d*) Economic importance of silk.

5. Describe in detail any *one* of the following : 8

(*a*) Safe handling of pesticides

(*b*) Biological control of insect pests.

OR

Paper XV (D)

(Environmental Biology—II)

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) *All* questions carry equal marks.

(*iii*) Draw well labelled diagrams wherever necessary.

1. Write notes on any *four* of the following : 8

(*a*) Sources of lead

(*b*) Acid rain

(*c*) Sources of noise pollution

(*d*) Formal Education in India

(*e*) Chlorofluorocarbons

(*f*) Algal blooms.

2. Write notes on any *two* : 8

(*a*) Sources and effects of water pollution

(*b*) Pollution by sewage and domestic waste

(*c*) Biodegradable and non-biodegradable pollutants

(*d*) Effects of lead.

3. Write notes on any *two* : 8

(*a*) Thermal power plants and industrial chimney waste

(*b*) Sources and effects of sulphate compounds

(*c*) Sources and effects of oxides of nitrogen

(*d*) Photochemical smog.

4. Write notes on any *two* : 8

(*a*) Radioactive pollution

(*b*) Noise pollution

(c) Sources of solid waste pollution

(d) Effects of solid waste pollution.

5. Attempt any *one* : 8

(a) Describe Imhoff tank in detail.

(b) Explain Aerobic and Anaerobic treatments.

This question paper contains 4 printed pages]

G—289—2015

FACULTY OF SCIENCE

B.Sc. (Third Year) (Sixth Semester) EXAMINATION

MARCH/APRIL, 2015

BOTANY

Paper XV (Optional-I)

(Plant Pathology–II)

OR

(Systematic Botany-II)

(Friday, 10-4-2015) **Time : 10.00 a.m. to 12.00 noon**

Time—Two Hours *Maximum Marks*—40

(Plant Pathology–II)

N.B. :— (*i*) Attempt *All* questions.

(*ii*) *All* questions carry equal marks.

(*iii*) Draw neat and well labelled diagrams wherever necessary.

1. Write notes on (any *four*) :

(*i*) Scope of Aerobiology

(*ii*) Thiram

P.T.O.

(*iii*) Symptoms of Jowar rust

(*iv*) Papaya mosaic

(*v*) Conidia of *Fusarium*

(*vi*) Sclerotium.

2. Write notes on (any *two*) :

(*i*) External seed-borne pathogens

(*ii*) Solar heat and hot water treatment

(*iii*) Pre-existing structural defense

(*iv*) Antifungal antibiotics.

3. Write notes on (any *two*) :

(*i*) Disease forecasting

(*ii*) Integrated pest management

(*iii*) Internal seed-borne pathogens

(*iv*) Role of phenolic compounds in defense mechanism.

4. Describe in detail any *one* of the following :

(*i*) Symptoms, causal organism, disease cycle and control measures of Tikka disease of groundnut

(*ii*) Symptoms, causal organism, disease cycle and measures of late blight of potato.

5. Write short notes on (any *two*) :

(*i*) Little leaf of Brinjal

(*ii*) Leaf curl of Tomato

(*iii*) Symptoms of wilt of Tur

(*iv*) Disease cycle of stem rust of Wheat.

OR

(Systematic Botany-II)

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) *All* questions carry equal marks.

(*iii*) Illustrate your answers with well labelled diagrams wherver necessary.

1. Write short notes on any *four* : 8

(*i*) Explain bract of Bougainvillea.

(*ii*) Explain stipules in Rubiaceae.

(*iii*) Explain stamens in Marantaceae.

(*iv*) What is Palynology ?

(*v*) Who proposed pteridosperm theory ?

(*vi*) Give botanical name and family of 'Teak'.

2. Write notes on any *two* : 8

(*i*) Give floral morphology of Zingiberaceae.

(*ii*) Give floral morphology of Apocynaceae.

(*iii*) Economic importance of Convolvulaceae.

(*iv*) Economic importance of Cyperaceae.

3. Write notes on any *two* : 8

(*i*) Floral morphology of Orchidaceae

(*ii*) Floral morphology of Asclepidaceae

(*iii*) Economic importance of Musaceae

(*iv*) Economic importance of Cannaceae.

4. Describe in detail any *one* of the following : 8

(*i*) Explain in detail Gnetalean theory of origin of Angiosperms.

(*ii*) Explain in detail the the structure of pollen grain of 'Hibiscus.

5. Write short notes on any *two* : 8

(*i*) Pollen grains of grasses

(*ii*) Pteridosperm theory

(*iii*) Importance of Palynology

(*iv*) Bennettitalean theory.

This question paper contains 3 printed pages]

G—287—2015

FACULTY OF SCIENCE

B.Sc. (Third Year) (Sixth Semester) EXAMINATION

MARCH/APRIL, 2015

BOTANY

Paper XIV

(Genetics and Biotechnology)

(Thursday, 9-4-2015) Time : 10.00 a.m. to 12.00 noon

Time—Two Hours *Maximum Marks*—40

N.B. :— (*i*) Attempt *All* questions.

(*ii*) *All* questions carry equal marks.

(*iii*) Draw neat and well labelled diagrams wherever necessary.

1. Write notes on any *four* : 8

(*i*) Test cross

(*ii*) Criss-cross inheritance

(*iii*) Euploidy

P.T.O.

(*iv*) Trisomy

(*v*) Somatic hybridization

(*vi*) Totipotency of Cell.

2. Write notes on any *two* : 8

(*i*) Law of Dominance

(*ii*) Complementary gene interaction

(*iii*) Inheritance of white eye colour in Drosophila

(*iv*) Sex determination in Man.

3. Write notes on any *two* : 8

(*i*) Coupling and repulsion hypothesis

(*ii*) Duplicate gene interaction

(*iii*) Inheritance of holandric gene in Man

(*iv*) Types of sex linked inheritance.

4. Describe in detail any *one* of the following : 8

(*i*) What is polyploidy ? Describe Allopolyploidy with reference to Raphanobrassica.

(*ii*) What is *r*-DNA technology ? Describe the technique and applications of *r*-DNA technology.

5. Write notes on any *two* : 8

(*i*) Aneuploidy

(*ii*) Down's syndrome

(*iii*) Callus culture

(*iv*) Transgenic plants.

This question paper contains 2 printed pages]

AO—10—2015

FACULTY OF SCIENCE

B.Sc. (F.T.) (Sixth Semester) EXAMINATION

MARCH/APRIL, 2015

FOOD TECHNOLOGY

Paper 310

(Extrusion Technology)

(Monday, 13-4-2015) **Time : 10.00 a.m. to 12.00 noon**

Time—Two Hours *Maximum Marks*—40

N.B. :—(*i*) *All* questions are compulsory.

(*ii*) *All* questions carry equal marks.

1. Solve any *two* : 10

(*a*) Write on the single screw extrusers.

(*b*) State the properties of extruded foods.

(*c*) Write on the principles of extrusion technology.

(*d*) State the sources of food proteins.

P.T.O.

2. Solve any *two* : 10

(*a*) State the packaging requirement of extruded food.

(*b*) Write on various methods of extrusion cooking.

(*c*) State the nutritional aspect of extruded food.

3. Solve any *one* : 10

(*a*) Write in detail on twin screw extruders with their application.

(*b*) Write in detail on commercial development and marketing aspect of meats.

4. Write short notes :

(*a*) Amino acid fortification in baked foods. 6

Or

Importance of extrusion technology.

(*b*) New protein foods. 4

Or

Raw material for extruded products.

This question paper contains 4 printed pages]

M—25—2015

FACULTY OF COMPUTER STUDIES

B.Sc. (CS) (Sixth Semester) EXAMINATION

MARCH/APRIL, 2015

(Revised Course)

COMPUTER SCIENCE

(Oracle 10-G DBA)

(Monday, 13-4-2015) **Time : 10.00 a.m. to 1.00 p.m.**

Time—Three Hours *Maximum Marks*—80

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) Figures to the right indicate full marks.

(*iii*) Assume suitable data if necessary.

1. (*a*) What are trace and alert log files ? Explain. 5

(*b*) Describe read-only tablespaces of Oracle. 5

P.T.O.

(c) Explain distribution of CPU requirements in database tunning. 5

(d) What is database auditing ? Explain database authentication. 5

2. (a) Explain in detail the memory architecture of oracle 91. 8

(b) What are online and off-line tablespaces in Oracle 10 G ? Explain. 7

Or

(c) Explain the steps of database creation using DBCA in Oracle 10 G. 8

(d) What are locally managed tablespaces ? Explain its advantages. 7

3. (a) What is Automatic storage management in Oracle 10 G ? Explain ASM instance components. 8

(b) How undo tablespace are managed ? Explain its initialization parameters and multiple undo tablespace. 7

Or

(*c*) What is system tablespace in Oracle 10 G ? Explain in detail. 8

(*d*) What are data files and control files ? Explain moving data files and control files with example. 7

4. (*a*) What is incremental back up ? Explain recovering with incrementally updated back ups in Oracle 10 G. 8

(*b*) Describe tunning data manipulations in Oracle 10 G. 7

Or

(*c*) What is role ? Explain creating, assigning and maintaining roles. 8

(*d*) What is memory usage tunning ? Explain in detail. 7

5. Write short notes on (any *three*) : 15

(*a*) Schema object auditing

(*b*) Data pump export and import

(*c*) Multiplexed control files

(*d*) Manual database creation

(*e*) Object privileges.

This question paper contains 3 printed pages]

M—36—2015

FACULTY OF COMPUTER STUDIES

B.Sc. (CS) (Sixth Semester) EXAMINATION

MARCH/APRIL, 2015

(Revised Course)

COMPUTER SCIENCE

(Business Application)

(Thursday, 16-4-2015) **Time : 10.00 a.m. to 1.00 p.m.**

Time—Three Hours *Maximum Marks*—80

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) Assume data if required.

(*iii*) Figures to the right indicate full marks.

1. Attempt the following : 20

(*a*) Explain ERP.

(*b*) Explain ATM application.

(*c*) Explain work order management.

(*d*) Explain payroll.

P.T.O.

2. (a) What is Market ? Explain market segments. 8

(b) Explain employee appraisal process. 7

Or

(a) Explain production planning. 8

(b) Explain employee training in detail. 7

3. (a) What are biometric devices ? Explain its scope and application. 8

(b) Explain customer relationship management. 7

Or

(a) Write case study on Human Resource Management. 8

(b) Explain International Business Management. 7

4. (a) Explain customer order processing. 8

(b) Explain supply chain management. 7

Or

(a) Explain material resource planning. 8

(b) What is savings account ? Explain the procedure to open a savings account. 7

5. Write short notes on (any *three*) : 15

(*a*) Consumer product;

(*b*) Deposit transaction;

(*c*) TQM;

(*d*) Employee recruitment;

(*e*) BPO.

This question paper contains 3 printed pages]

M—14—2015

FACULTY OF COMPUTER STUDIES

B.Sc. (CS) (Third Year) (Sixth Semester) EXAMINATION

MARCH/APRIL, 2015

(Revised Course)

COMPUTER SCIENCE

(Programming in Java–II)

(Friday, 10-4-2015) **Time : 10.00 a.m. to 1.00 p.m.**

Time—Three Hours *Maximum Marks*—80

N.B. :— (*i*) Attempt *All* questions.

(*ii*) Assume suitable data if necessary.

1. Attempt the following : 20

(*a*) Explain JDBC configuration.

(*b*) Explain inter-thread communication.

(*c*) Explain the concept of using beans to build an application.

(*d*) What is collection ? Describe collection classes in detail.

P.T.O.

2. (a) What is servelet and how to handle HTTP post request ? 8

(b) Describe bean writing process with example. 7

Or

(c) What is metadata and explain transaction in detail. 8

(d) Write a simple program in Java with JSP program to generate HTML Text. 7

3. (a) Write a simple program in Java with JDBC connectivity. 8

(b) What is synchronization and when do we use it ? 7

Or

(c) What is swing ? Explain 2D basic shape in detail. 8

(d) Explain how to create first JSP. 7

4. (a) Write a simple program in servelet program in Java. 8

(b) What is collection algorithm ? Write its basic method. 7

Or

(c) Explain the use of Java beans. 8

(d) Explain tags and sessions in detail. 7

5. Write short notes on (any *three*) : 15

(*i*) Scriptlets

(*ii*) Iterator

(*iii*) Vectors

(*iv*) Executing SQL statements

(*v*) JDBC drivers.

This question paper contains 8+3 printed pages]

M—47—2015

FACULTY OF SCIENCE

B.Sc. (CS) (Third Year) (Sixth Semester) EXAMINATION

MARCH/APRIL, 2015

(Revised Course)

COMPUTER SCIENCE

(Elective)

Paper S6.4(A)

(Data Mining)

Or

Paper S6.4(B)

(Research Methodology)

Or

Paper S6.4C

(Bioinformatics)

Or

Paper S6.4(D)

(Linux Administration)

(Saturday, 18-4-2015) **Time : 10.00 a.m. to 1.00 p.m.**

Time—Three Hours *Maximum Marks*—80

Paper S6.4(A)

(Data Mining)

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) Assume suitable data, if necessary.

(*iii*) Figures to the right indicate full marks.

P.T.O.

P.T.O.

1. Attempt the following : 20

(*a*) Explain prediction of data mining.

(*b*) Enlist data mining matrix.

(*c*) Explain missing data.

(*d*) Explain decision support system.

2. (*a*) Explain social implication of data mining. 8

(*b*) Explain multidimensional schemas. 7

Or

(*c*) Explain predictive data mining task. 8

(*d*) How is information retrieval from the database ? Explain. 7

3. (*a*) Explain mode based on summarization. 8

(*b*) Write an algorithm to create a decision tree. 7

Or

(*c*) Explain hypothesis testing. 8

(*d*) Explain Bayesian classification. 7

4. (*a*) Write on minimum spanning tree algorithm. 8

(*b*) Explain association rule with example. 7

Or

(*c*) Write an algorithm for bond energy. 8

(*d*) Write an algorithm for partitioning. 7

5. Write short notes on (any *three*) : 15

(*a*) Cart;

(*b*) Clustering;

(*c*) Simple approach;

(*d*) C4.5;

(*e*) Task parallelism.

OR

Paper S6.4(B)

(Research Methodology)

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) Assume suitable data, if necessary.

1. Attempt the following : 20

(*a*) Discuss the reasons for doing research.

(*b*) What is internet ? Explain in detail www.

(*c*) Explain the purpose of literature review.

(*d*) Explain how to conduct the literature review.

2. (*a*) Explain in detail the model of research process. 8

(*b*) Explain in detail, how to evaluate survey based research. 7

Or

(*c*) Discuss the various research strategies and methods. 8

(*d*) Explain how to evaluate the purpose and the product of research. 7

3. (*a*) Explain with example case studies in IS and computing research. 8

(*b*) Explain how to evaluate experiment based research. 7

Or

(*c*) Explain in detail planning and conducting experiment. 8

(*d*) Explain the use of internet in case-studies. 7

4. (*a*) Explain in detail the types of surveys. 8

(*b*) Explain in detail evaluation of research process. 7

Or

(*c*) Explain in detail finding and choosing research topics. 8

(*d*) Explain the use of internet in literature review. 7

5. Write short notes on (any *three*) : 15

(*a*) Hypothesis;

(*b*) Outcomes of research;

(*c*) Case studies;

(*d*) Information system;

(*e*) Experiments.

OR

Paper S6.4(C)

(Bioinformatics)

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) Figures to the right indicate full marks.

1. Attempt the following : 20

(*a*) Explain the applications of bioinformatics.

(*b*) Discuss the history of bioinformatics in brief.

(*c*) What do you mean by physical map ?

(*d*) What is the use of BLASTA Algorithm ?

2. (*a*) What are the different areas which influence drug discovery ? 8

(*b*) What are major databases in bioinformatics ? 7

Or

(*c*) Explain the concept of Genome Analysis. 8

(*d*) What are the methods of Sequence Alignment ? 7

3. (*a*) What do you mean by "Alignments of pairs of sequences" ? 8

(*b*) What are the different important parameters in drug discovery ? 7

Or

(*c*) Explain the concept of Genetic map in detail. 8

(*d*) Explain the importance of drug discovery. 7

4. (*a*) Explain how data mining is useful in Bioinformatics. 8

(*b*) What are the different sequence analysis tasks ? 7

Or

(*c*) Following are the two sequences. Explain how to measure their similarity : 8

ATAAC TTTAATTAA

ATCC–TTTACTAA–

ATAACTTTAATTAA

ATCC–TTTAC-TAA

(*d*) Why is multiple sequence alignment necessary ? 7

5. Write short notes on the following (any *three*) : 15

(*i*) Homology;

(*ii*) P-value;

(*iii*) RNA;

(*iv*) Gap Score;

(*v*) Global Alignment.

OR

Paper S6.4(D)

(Linux Administration)

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) Figures to the right indicate full marks.

(*iii*) Assume suitable data, if necessary.

1. Attempt the following : 20

(*a*) Explain text editors.

(*b*) Explain configuring X-windows system;

(*c*) Explain Network printer installation.

(*d*) Explain using RPM on the command-line.

2. (*a*) Explain Hardware Requirements in detail. 8

(*b*) Explain selecting and using X-window. 7

P.T.O.

Or

(c) Explain system services and run levels. 8

(d) Explain graphical package management. 7

3. (a) Explain linux printing command with example. 8

(b) Explain other linux distribution. 7

Or

(c) Explain configuring and managing print services. 8

(d) Explain controlling services at boot with administrative tools. 7

4. (a) Explain Linux file system in detail. 8

(b) Explain shells in detail. 7

Or

(c) Explain Common Unix printing system. 8

(d) Explain extracting a single file and RPM file. 7

5. Solve the following (any *three*) : 15

(*a*) Advantages of linux;

(*b*) Console print control;

(*c*) Basic X-window system;

(*d*) Changing user information;

(*e*) LiLo.

This question paper contains 4 printed pages]

M—25—2015

FACULTY OF COMPUTER STUDIES

B.Sc. (CS) (Sixth Semester) EXAMINATION

MARCH/APRIL, 2015

(Revised Course)

COMPUTER SCIENCE

(Oracle 10-G DBA)

(Monday, 13-4-2015) **Time : 10.00 a.m. to 1.00 p.m.**

Time—Three Hours *Maximum Marks—80*

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) Figures to the right indicate full marks.

(*iii*) Assume suitable data if necessary.

1. (*a*) What are trace and alert log files ? Explain. 5

(*b*) Describe read-only tablespaces of Oracle. 5

P.T.O.

(c) Explain distribution of CPU requirements in database tunning. 5

(d) What is database auditing ? Explain database authentication. 5

2. (a) Explain in detail the memory architecture of oracle 91. 8

(b) What are online and off-line tablespaces in Oracle 10 G ? Explain. 7

Or

(c) Explain the steps of database creation using DBCA in Oracle 10 G. 8

(d) What are locally managed tablespaces ? Explain its advantages. 7

3. (a) What is Automatic storage management in Oracle 10 G ? Explain ASM instance components. 8

(b) How undo tablespace are managed ? Explain its initialization parameters and multiple undo tablespace. 7

Or

(*c*) What is system tablespace in Oracle 10 G ? Explain in detail. 8

(*d*) What are data files and control files ? Explain moving data files and control files with example. 7

4. (*a*) What is incremental back up ? Explain recovering with incrementally updated back ups in Oracle 10 G. 8

(*b*) Describe tunning data manipulations in Oracle 10 G. 7

Or

(*c*) What is role ? Explain creating, assigning and maintaining roles. 8

(*d*) What is memory usage tunning ? Explain in detail. 7

5. Write short notes on (any *three*) : 15

(*a*) Schema object auditing

(*b*) Data pump export and import

(*c*) Multiplexed control files

(*d*) Manual database creation

(*e*) Object privileges.