

This question paper contains 4+2 printed pages]

AD—63—2015

FACULTY OF SCIENCE

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

OCTOBER/NOVEMBER, 2015

CHEMISTRY

Paper XII

(Organic and Inorganic Chemistry)

(Tuesday, 24-11-2015)

Time : 2.00 p.m. to 4.00 p.m.

Time—Two Hours

Maximum Marks—40

N.B. :— (i) Attempt All questions.

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

(iii) Figures to the right indicate full marks.

Section A

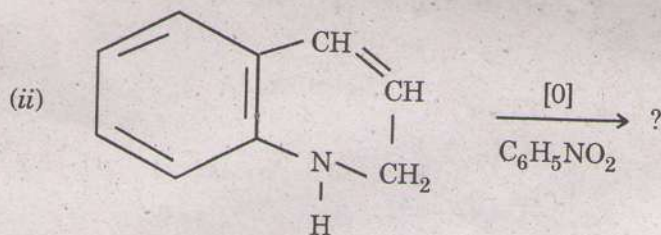
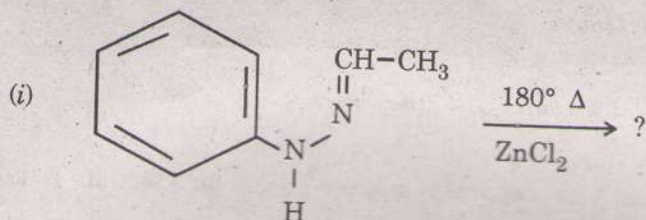
(Organic Chemistry)

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

(a) Explain the term antiseptic and disinfectants. Give *one* example of each.

P.T.O.

- (b) Explain in brief Armstrong's theory.
- (c) What happens when thiophene is treated with mercuric chloride?
- (d) How will you convert furan to tetrahydrofuran?
- (e) Write the structural formula of vitamin 'K'. Mention its sources and diseases caused by its deficiency.
- (f) Predict the product(s) :



- (g) What are alkaloids? Give extraction method of general alkaloids.

WT

(3)

AD-63-2015

2. Answer any *two* of the following :

2×5=10

(a) Explain the synthesis and uses of the following drugs :

(i) Paracetamol

(ii) Isoniazide

(b) What are 'rodenticides' ? Give the synthesis and uses of the following pesticides :

(i) D.D.T.

(ii) Carbaryl

(c) How will you convert :

(i) Furan to pyrrole

(ii) n-butane to thiophene

(iii) pyrrole to 2-aldehyde pyrrole.

3. Answer any *one* of the following :

1×7=7

(a) What are dyes ? Give the synthesis and applications of the following dyes :

(i) Phenolphthalein

P.T.O.

- (ii) Congored
 - (iii) Alizarin
- (b) Discuss the general chemical constitution of Alkaloids.

Section B

(Inorganic Chemistry)

4. Solve any *three* of the following : 3×3=9
- (a) Define chelate, double salt and geometrical isomerism.
 - (b) Explain the rules of nomenclature of co-ordination compound in case of :
 - (i) Formula
 - (ii) Order of naming the ions
 - (iii) Order of naming the ligand
 - (c) Calculate ENA of :
 - (i) $[\text{Cu}(\text{NH}_3)_4]^{2+}$
 - (ii) $[\text{CoCl}_4]^{-2}$
 - (iii) $[\text{Fe}(\text{CN})_6]^{-4}$

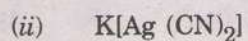
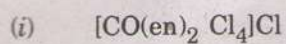
- (d) Discuss theoretical basis of hardness and softness with reference to polarizing power and polarizability.
- (e) Explain, how electronegativity can be used to explain hardness and softness of acids and bases.

5. Solve any *two* of the following :

2×2=4

(a) What is linkage isomerism ? Give its example.

(b) Give the IUPAC name of :



(c) Classify monodentate and polydentate ligands :

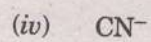
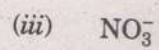
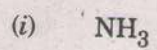
(i) Ethylene diamine

(ii) Pyridine

(iii) Dimethylglyoximate

(iv) Water

(d) Which of the following are hard bases and soft bases ?



This question paper contains 7 printed pages]

AD—58/59—2015

FACULTY OF SCIENCE/ARTS

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

OCTOBER/NOVEMBER, 2015

MATHEMATICS

Paper XV (A)

(Operation Research)

OR

Paper XV (B)

[Mechanics—I (Statics)]

(Monday, 23-11-2015)

Time : 2.00 p.m. to 4.00 p.m.

Time—Two Hours

Maximum Marks—40

Paper XV (A)

(Operation Research)

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 optimum solution.

P.T.O.

- (b) Define surplus variables.
- (c) Define Net Evaluation.
- (d) Define Improved Basic Feasible Solution.
- (e) If there are 5 jobs and 5 workers, then find total number of assignments.

- (f) If cost matrix is $\begin{bmatrix} 8 & 7 & 6 \\ 5 & 7 & 8 \\ 6 & 8 & 7 \end{bmatrix}$, draw the associated network.

2. Attempt any *two* of the following :

5 each

- (a) Explain the canonical form of L.P.P.
- (b) Prove that the set of feasible solutions to an L.P.P. is a convex set.
- (c) Use the graphical method to solve the following L.P.P. :

Maximize : $z = 2x_1 + 3x_2;$

Subject to the constraints :

$$x_1 + x_2 \leq 30;$$

$$x_1 - x_2 \geq 0;$$

$$x_2 \geq 3;$$

$$0 \leq x_1 \leq 20 \text{ and } 0 \leq x_2 \leq 12.$$

3. Attempt any two of the following :

5 each

- (a) Let there exist a basic feasible solution to a given L.P.P. If at least one j , for which $Y_{ij} \leq 0$ ($i = 1, 2, \dots, m$) and $z_j - c_j$ is negative, then prove that there does not exist any optimum solution to this L.P.P.
- (b) Explain the computational procedure to solve the L.P.P. by simplex method.
- (c) Show that the following system of linear equations has a degenerate solution :

$$2x_1 + x_2 - x_3 = 2$$

$$3x_1 + 2x_2 + x_3 = 3.$$

4. Attempt any two of the following :

5 each

- (a) Explain the nature of a travelling salesman problem and give its mathematical formulation.

P.T.O.

- (b) Given below is an assignment problem, write it as a transportation problem :

	A ₁	A ₂	A ₃
R ₁	1	2	3
R ₂	4	5	1
R ₃	2	1	4

- (c) Kapil Airlines that operates seven days a week has a timetable as shown below. Crews must have a minimum layover of 5 hours between flights. Obtain the pairing of flights that minimizes layover time away from home. For any given pairing, the crew will be based at the city that results in the smaller layover :

Flight No.	Depart	Arrive	Flight No.	Depart	Arrive
1	7.00 a.m.	8.00 a.m.	101	8.00 a.m.	9.15 a.m.
2	8.00 a.m.	9.00 a.m.	102	8.30 a.m.	9.45 a.m.
3	1.30 p.m.	2.30 p.m.	103	12.00 noon	1.15 p.m.
4	6.30 p.m.	7.30 p.m.	104	5.30 p.m.	6.45 p.m.

For each pair also mention the town where the crew should be based.

OR

Paper XV (B)

[Mechanics—I (Statics)]

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 Law of the parallelogram of forces.
 - (b) Find the resultant of two forces whose magnitudes are 8 kg and 7 kg respectively at an angle of 60° .
 - (c) State the Lami's theorem.
 - (d) What is necessary and sufficient condition for an equilibrium forces acting on a particle ?
 - (e) Define arms of the couple.
 - (f) Find the vector moment of a force $\vec{F} = 2\hat{i} - \hat{j} + 5\hat{k}$ acting at a point $P \equiv (1, -2, 3)$ about the origin.

P.T.O.

2. Attempt any *two* of the following :

5 each

- (a) To determine the magnitude and direction of the resultant \vec{R} of two forces \vec{P} and \vec{Q} acting at an angle θ . Deduce this result for $\theta = 0$.
- (b) Prove that, the algebraic sum of the resolved parts of two forces in a given direction is equal to the resolved parts of their resultant along the same direction.
- (c) A particle is acted upon by three forces in one plane, equal to 2, $2\sqrt{2}$ and 1 kg respectively. The first force is horizontal, the second acts at 45° to the horizontal and third is vertical. Find the magnitude and direction of the resultant.

3. Attempt any *two* of the following :

5 each

- (a) State and prove, theorem on polygon of forces.
- (b) Three forces of magnitudes P, Q, R acting on a particle are in equilibrium and the angle between P and Q is double the angle between P and R, show that $R^2 = Q(Q - P)$.

- (c) A and B are two smooth pegs in a horizontal line at a distance 5 m apart. Two light inextensible strings CA and CB of length 3 m and 4 m respectively attached to pegs. Find the tensions in the strings, when a weight of 10 kg is suspended from C.

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

- (a) Prove that, the magnitude of the couple equals to the product of magnitude of a force in the couple and arm of the couple.
- (b) Prove that, a system of forces acting upon a rigid body is equivalent to a forces at any arbitrary point together with a couple.
- (c) A force \vec{F} of magnitude 8 units act at a point P(2, 3, 4) along the line :

$$\frac{x-2}{3} = \frac{y-3}{4} = \frac{z-4}{5}$$

Find the magnitude of the force \vec{F} about x axis.

This question paper contains 8+2 printed pages]

AD—94—2015

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2015

(Revised Course)

ZOOLOGY

Paper XIII (A) : (Aquaculture)

Or

Paper XIII (B) : Applied Parasitology

(Parasitic Protozoa and Platyhelminthes)

Or

Paper XIII (C) : (Entomology—I)

Or

Paper XIII (D) : (Environmental Biology—I)

(Friday, 4-12-2015)

Time : 2.00 p.m. to 4.00 p.m.

Time—2 Hours

Maximum Marks—40

Paper XIII (A)

(Aquaculture)

- N.B.* :— (i) Attempt All questions.
(ii) All questions carry equal marks.
(iii) Draw well labelled diagrams wherever necessary.

P.T.O.

1. Write notes on any *four* of the following : 8
- (a) Concept of extensive aquaculture
 - (b) Advantages of polyculture
 - (c) Use of sewage in aquaculture
 - (d) Advantages of aquatic weeds
 - (e) Aquarium fishes
 - (f) Significance of aquarium keeping.
2. Write notes on any *two* of the following : 8
- (a) Scope of aquaculture
 - (b) Monoculture
 - (c) Paddy-cum-fish culture
 - (d) Fish-cum-duck culture.
3. Write notes on any *two* of the following : 8
- (a) Pen culture
 - (b) Cage culture
 - (c) Composition of sewage
 - (d) Domestic sewage and its hazards.

4. Write notes on any *two* of the following : 8
- (a) Types of aquatic weeds
 - (b) Control of aquatic weeds by manual and mechanical methods
 - (c) Fresh water Prawn culture
 - (d) Edible oyster culture.
5. Solve any *one* of the following : 8
- (a) Describe physical and biological properties of water.
 - (b) Explain construction and setting up of aquarium.

OR

Paper XIII (B)

Applied Parasitology

(Parasitic Protozoa and Platyhelminthes)

- N.B.* :— (i) Attempt *All* questions.
- (ii) *All* questions carry equal marks.
- (iii) Illustrate your answers with suitable labelled diagrams wherever necessary.

P.T.O.

1. Write notes on any *four* of the following : 8
- (a) Parasitism
 - (b) Mechanical vector
 - (c) Endoparasite
 - (d) Scolex of *Taenia saginata*
 - (e) Oncospheres
 - (f) Miracidium larva.
2. Write notes on any *two* of the following : 8
- (a) Structure of *Trichomonas vaginalis*
 - (b) Life cycle of *Trypanosoma gambiense*
 - (c) Classification of parasitic protozoa
 - (d) Morphology of *Giardia intestinalis*.
3. Write notes on any *two* of the following : 8
- (a) Morphology of *Sarcocystis cruzi*
 - (b) Life cycle of *Eimeria tenella*

(c) Morphology of *Entamoeba histolytica*

(d) Life-cycle of *Balantidium coli*.

4. Write notes on any two of the following :

8

(a) General organization of cestodes

(b) Life-cycle of *Echinococcus granulosus*

(c) Comparative account of reproductive organs of trematodes and cestodes.

(d) Pathogenicity and control measures of *Taenia saginata*.

5. Write long answer on any one of the following :

8

(a) Describe the morphology, life-cycle and pathogenicity of *Schistosoma haematobium*.

(b) Give an account of parasitic adaptations with special reference to trematodes.

OR

Paper XIII (C)

(Entomology—I)

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) Forest entomology

(b) Aspirator

(c) Legs of Cockroach

(d) Termite Queen

(e) Moth

(f) Ametabola.

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

8

(a) Define Entomology and give its scope as agricultural entomology.

- (b) Explain general characters of class insecta.
- (c) Explain various methods of insects killing.
- (d) Explain preservation of insects.

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

8

- (a) Explain digestive system of cockroach.
- (b) Explain respiratory system of cockroach.
- (c) Explain nervous system of cockroach.
- (d) Explain male reproductive system of cockroach.

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

8

- (a) Explain the salient features of order Thysanura with suitable examples.
- (b) Explain the salient features of order Odonata with suitable examples.

- (c) Explain the salient features of order Diptera with suitable examples.
- (d) Explain the salient features of order Coleoptera with suitable examples.
5. Describe in detail any *one* of the following : 8
- (a) Hormonal control of metamorphosis in insects
- (b) Effect of temperature and humidity on insects life.

OR

Paper XIII (D)

(Environmental Biology—I)

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

(ii) All questions carry equal marks.

(iii) Draw well-labelled diagrams wherever necessary.

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

(a) Hydrosphere

(b) Ecological pyramid

- (c) In-situ conservation
- (d) Threat to Biodiversity
- (e) Food web
- (f) Lithosphere.

2. Answer any *two* questions from the following : 8

- (a) Composition of Atmosphere
- (b) Physico-chemical properties of water
- (c) Carbon cycle
- (d) Nitrogen cycle.

3. Answer any *two* questions from the following : 8

- (a) Food chain
- (b) Zonation in Marine habitat
- (c) Components of Ecosystem
- (d) Ecological pyramids.

4. Answer any *two* questions from the following : 8

- (a) Threats to biodiversity

(b) Importance of Biodiversity

(c) Biodiversity in India

(d) Ex-situ conservation.

5. Answer any *one* question from the following :

8

(a) Management of wildlife.

(b) Aims of wild-life conservation.

This question paper contains 7 printed pages]

AD—51-1, 2, 4—2015(R)

FACULTY OF SCIENCE

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

OCTOBER/NOVEMBER, 2015

BOTANY

Paper XIII (Optional-1)

(Plant Pathology—I)

Or

(Systematic Botany—I)

Or

(Herbal Technology—I)

(Saturday, 21-11-2015)

Time : 2.00 p.m. to 4.00 p.m.

Time—Two Hours

Maximum Marks—40

(Plant Pathology—I)

N.B. :- (i) Attempt All questions.

(ii) All questions carry equal marks.

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

1. Describe classification of plant diseases on the basis of symptoms.

P.T.O.

WT

(2)

AD—51-1, 2, 4—2015(R)

Or

Write in brief :

- (a) Isolation of plant pathogens from infected plant parts.
 - (b) Koch's postulates.
2. Describe effect of temperature and moisture on disease development.

Or

Write in brief :

- (a) Mode of entry of pathogens through wounds.
 - (b) Dispersal of plant pathogens by air.
3. Describe symptoms, causal organisms, disease cycle and control measures of red rot of sugarcane.

Or

Write in brief :

- (a) Symptoms and causal organism of grain smut of Jowar.
 - (b) Yellow vein mosaic of Bhendi.
4. Describe symptoms, causal organism, disease cycle and control measures of powdery mildew of pea.

WT

(3)

AD—51-1, 2, 4—2015(R)

Or

Write in brief :

- (a) Symptoms and causal organism of white rust of Mustard.
 - (b) Symptoms and control measures of whip smut of Sugarcane.
5. Write short notes on any *four* of the following :
- (a) Scope of plant pathology
 - (b) Dispersal of plant pathogens by water
 - (c) Control measures of angular leaf spot of cotton
 - (d) Causal organism of green ear of *Bajra*
 - (e) Symptoms of leaf spot of *Turmeric*
 - (f) Bean mosaic.

OR

(Systematic Botany—I)

N.B. :— (i) Attempt *All* questions.

(ii) *All* questions carry equal marks.

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

1. Describe Bentham and Hooker's system of classification of plants. Add a note on its merits and demerits.

P.T.O.

WT

(4)

AD—51-1, 2, 4—2015(R)

Or

Write short notes on :

- (a) Phylogenetic classifications
 - (b) Applications of taxonomy.
2. Describe the role of Cytology in relation to taxonomy.

Or

Write short notes on :

- (a) Biological concept of species
 - (b) Effective and valid publication.
3. Describe the type of Keys. Add a note on the importance of Keys in plant identification.

Or

Write short notes on :

- (a) Importance of Herbarium
 - (b) Important botanical gardens in India.
4. Describe the family Rutaceae with floral formula and floral diagram.

Or

Write short notes on :

- (a) Floral characters of Myrtaceae.
 - (b) Economic importance of Combretaceae.
5. Write short notes on any *four* of the following :
- (a) Define artificial classifications
 - (b) Aims of Taxonomy
 - (c) Importance of Palynology in relation to Taxonomy
 - (d) Species cover
 - (e) Tendrils in Cucurbitaceae
 - (f) Androphore.

OR

(Herbal Technology—I)

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

(ii) *All* questions carry equal marks.

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

1. Give an account of Ayurvedic system of medicine.

WT

(6)

AD—51-1, 2, 4—2015(R)

Or

Write short notes on : 8

(a) Unani system of medicine

(b) Naturopathy.

2. Give an account of morphological and pharmacological classification of plant drugs. 8

Or

Write short notes on : 8

(a) Storage of crude drugs

(b) Gums and resins.

3. Describe distribution, morphology, chemical constituents and applications of Ashwagandha. 8

Or

Write short notes on : 8

(a) Hirida

(b) Ginger.

4. Describe in detail morphological and chemical method of drug evaluation. 8

Or

Write short notes on : 8

(a) Drug adulteration

(b) Physical method of drug evaluation.

5. Write short notes on any *four* of the following :

8

- (a) Yoga
- (b) Latex
- (c) Barks
- (d) Korphad
- (e) Biomedicines
- (f) Transgenic plants.

This question paper contains 4 printed pages]

AD—68—2015

FACULTY OF SCIENCE

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

OCTOBER/NOVEMBER, 2015

CHEMISTRY

Paper XIII

(Physical Chemistry + Inorganic Chemistry)

(Thursday, 29-10-2015)

Time : 2.00 p.m. to 4.00 p.m.

Time—Two Hours

Maximum Marks—40

- N.B. :-*
- (i) Use of logarithmic table and calculator is allowed.
 - (ii) Use separate answer-books for Sections A and B.
 - (iii) Attempt *All* questions.
 - (iv) Figures to the right indicate full marks.

Section A

(Physical Chemistry)

1. Answer any *five* of the following : 10
- (i) Define third order reaction. Give its any *two* examples.

P.T.O.

- (ii) State and explain Nernst distribution law.
- (iii) Discuss the kinetics of decomposition of HI.
- (iv) Explain the $\sigma \rightarrow \sigma^*$ and $\sigma \rightarrow \pi^*$ electronic transition with energy level diagram.
- (v) Explain consecutive reaction.
- (vi) Give the application of distribution law in solvent extraction.
- (vii) What is force constant? Discuss qualitatively relation between force constant and bond energy.

2. Answer any *two* of the following :

10

- (i) Discuss the kinetics of reversible reaction.
- (ii) State and explain the Franck-Condon principle for electronic transition.
- (iii) The fundamental vibrational frequency of a diatomic molecule is 2890 cm^{-1} . Calculate force constant. The reduced mass is $1.70 \times 10^{-27} \text{ kg}$.

$$(h = 6.626 \times 10^{-34} \text{ Js}, c = 3 \times 10^8 \text{ m/s})$$

3. Answer any one of the following :

7

- (i) Discuss the quantum theory of Raman Scattering.
- (ii) (a) Derive an expression for Nernst distribution law when solute undergoes dissociation.
- (b) The following data were obtained for the distribution of I_2 between CS_2 and H_2O at 298 K.

Conc. of I_2 in CS_2 ($gm\ dm^{-3}$) $\times 10^3$	Conc. of I_2 in H_2O ($gm\ dm^{-3}$) $\times 10^{-3}$
0.042	102
0.067	163
0.130	317
0.175	426

Calculate K_D of I_2 between CS_2 and H_2O .

Section B

(Inorganic Chemistry)

4. Solve any three of the following :

3×3=9

- (a) Give the methods of preparation of organo-titanium compound (any three).

P.T.O.

- (b) What is the action of RI , BCl_3 and halogens on organolithium compound ?
- (c) Explain types of organometallic compounds.
- (d) Give the properties of $[\text{Ni}(\text{CO})_4]$.
- (e) Explain metal-carbon bonding in metal carbonyl.
5. Solve any *two* of the following : 2×2=4
- (a) Draw the structure of $\text{Fe}_2(\text{CO})_{12}$ and $\text{Co}_2(\text{CO})_8$.
- (b) Give names of the following organometallic compounds :
- (i) $\text{C}_6\text{H}_5\text{MgCl}$
- (ii) $[(\text{CO})_4\text{Co}-\text{Co}(\text{CO})_4]$.
- (c) What are applications of organotin compound in agriculture ?
- (d) Draw a structure of Al_2Me_6 . Give its bond angle and bond length.

This question paper contains 3 printed pages]

AD-74-2015

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2015

(Revised Course)

PHYSICS

Paper XII (PHY-302)

(Quantum Mechanics)

(Thursday, 3-12-2015)

Time : 2.00 p.m. to 4.00 p.m.

Time—2 Hours

Maximum Marks—40

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

(ii) Figures to the right indicate full marks.

(iii) Given data :

$$h = 6.63 \times 10^{-34} \text{ J.S.}$$

$$m = 9.1 \times 10^{-31} \text{ kg.}$$

1. Attempt any four :

8

(a) State De Broglie's hypothesis of matter wave.

P.T.O.

- (b) Write an expression for the normalised wave function of the particle in a box.
- (c) Write the wave function of a particle in three-dimensional box.
- (d) State an expression for angular momentum associated with an electron in hydrogen atom.
- (e) A proton at rest is accelerated with a momentum of 2.312×10^{-22} kgm/s. Find wavelength associated with proton.
- (f) The life time of an excited state of an atom is about 10^{-8} sec. Calculate minimum uncertainty in the determination of energy of the excited state.

2. Solve any two :

8

- (a) Explain Compton effect. Obtain an expression for Compton shift of wavelength due to scattering of electron by photon.
- (b) On the basis of uncertainty principle show that electrons are not present in the nucleus.
- (c) What is photoelectric effect ? Discuss experimental set up for photoelectric effect.

3. Attempt any *two* : 8
- (a) Derive an expression for Schrödinger's wave equation in time dependent form.
 - (b) Derive wave function for a particle in one-dimensional box.
 - (c) State and explain eigen value and eigen function.
4. Attempt any *one* : 8
- (a) Derive energy of a particle in three-dimensional box.
 - (b) Explain harmonic oscillator.
5. Write short notes on any *two* : 8
- (a) Schrödinger's equation for hydrogen atom in spherical polar co-ordinate system
 - (b) Electron probability density
 - (c) Magnetic quantum number
 - (d) Orbital quantum number.

This question paper contains 4 printed pages]

AD—92/93—2015

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2015

(New Course)

PHYSICS

Paper XIII

(Solid State Physics)

Or

(Astrophysics)

(Friday, 4-12-2015)

Time : 2.00 p.m. to 4.00 p.m.

Time—2 Hours

Maximum Marks—40

(Solid State Physics)

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

(ii) All questions carry equal marks.

1. Attempt any four :

8

(a) Define lattices and bases.

(b) What are ionic crystals ?

(c) State Dulong Petit's law of specific heat.

P.T.O.

- (d) State Wiedemann-Franz's law.
- (e) What is a unit cell ?
- (f) How does hydrogen bond differ from dipole bond ?
2. Attempt any *two* : 8
- (a) Define symmetry operations. Explain translation and rotation symmetry operations.
- (b) Derive an expression for the specific heat of solids by using classical theory.
- (c) Derive an expression for electrical conductivity of metals.
3. Attempt any *two* : 8
- (a) What are Bravais lattices ? Explain cubic crystal system in three-dimensions using Bravais lattices.
- (b) Explain in brief hydrogen bond.
- (c) Discuss Drude-Lorentz theory with its drawbacks.
4. Attempt any *one* : 8
- (a) Explain formation of metallic bonds in solids with a suitable example.
- (b) Discuss the Debye model of lattice heat capacity. What is Debye T^3 law ?
5. Write short notes on any *two* : 8
- (a) Face-Centred Cubic (FCC) structure

- (b) Ionic bond
- (c) Behaviour of specific heat at high temperature for Einstein's theory
- (d) Quantum theory of free electrons in a box.

OR

(Astrophysics)

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

(ii) All questions carry equal marks.

1. Attempt any four :

8

- (a) Define parsec.
- (b) Give the ranges of infrared, visible and ultraviolet radiations in terms of wavelength.
- (c) Write down different parts (layers) of the atmosphere of sun.
- (d) What do you mean by sunspot ?
- (e) State main characteristics of the earth responsible for existence of human life.
- (f) Write down names of planets of our solar system along with their distances from sun.
- (g) What do you mean by minor objects on a solar system ? What are the different types of them ?

P.T.O.

2. Attempt any *two* : 8
- (a) Explain in brief the transmission of radiations through the atmosphere.
 - (b) Describe temperature variations in photosphere.
 - (c) Discuss in short steady state cosmology.
3. Attempt any *two* : 8
- (a) Derive an expression for black body radiation and Wien's law.
 - (b) Explain Kepler's laws of planetary motion.
 - (c) Describe structure and composition of Venus.
4. Attempt any *one* : 8
- (a) Explain in detail spectral classification of stars.
 - (b) Explain the structure, composition and atmosphere of Mars.
5. Write short notes on any *two* : 8
- (a) Cosmological test
 - (b) Comets
 - (c) H-R diagram
 - (d) The Milky-way galaxy.

This question paper contains 3 printed pages]

AD—43—2015

FACULTY OF SCIENCE

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

OCTOBER/NOVEMBER, 2015

(New Course)

BOTANY

Paper XII

(Plant Physiology)

(Friday, 23-10-2015)

Time : 2.00 p.m. to 4.00 p.m.

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. What is transpiration ? Add a note on opening and closing of stomata.

8

P.T.O.

WT

(2)

AD-43-2015

Or

(a) Osmosis

(b) Classification of plant movements.

2. What are macro elements ? Explain source, role and deficiency symptoms of N and P in plants. 8

Or

(a) Active absorption of minerals.

(b) Mechanism of translocation of food in plants.

3. What is growth ? Explain different phases of growth. 8

Or

(a) Applications of cytokinins;

(b) Methods of breaking of seed dormancy.

4. What are carbohydrates ? Add a note on monosaccharides. 8

Or

(a) Secondary structure of proteins;

(b) Biological functions of terpenoids.

5. Write short notes on any *four* :

8

- (a) Plasmolysis
- (b) Chemotropism
- (c) Role of Zn in plant nutrition
- (d) Application of Abscissic acid
- (e) LDP
- (f) Functions of Cellulose.

This question paper contains 3 printed pages]

AD—75—2015

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2015

ZOOLOGY

Paper XII

(Ecology and Zoogeography)

(Thursday, 3-12-2015)

Time : 2.00 p.m. to 4.00 p.m.

Time—2 Hours

Maximum Marks—40

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

(ii) Draw neat well labelled diagrams, wherever necessary.

(iii) All questions carry equal marks.

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

8

(a) Abiotic components

(b) Natality

P.T.O.

- (c) Fossil fuels
- (d) Endanger species
- (e) Hydrosphere

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

8

- (a) Pond ecosystem
- (b) Biotic components of ecosystem
- (c) Atmosphere
- (d) Carbon cycle.

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

8

- (a) Mortality
- (b) Mutualism
- (c) Age distribution
- (d) Population growth.

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

8

- (a) Sources and effects of water pollution

- (b) Control measures of air pollution
 - (c) Nuclear power
 - (d) Advantages and disadvantages of conventional energy resources.
5. Describe any *one* of the following : 8
- (a) Aim and necessity of wildlife conservation
 - (b) Ecological adaptation of animals in aquatic habitat.

This question paper contains 3 printed pages]

AD—16—2015

FACULTY OF SCIENCE

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

OCTOBER/NOVEMBER, 2015

MICROBIOLOGY

Paper XII

(Microbial Genetics)

(Tuesday, 20-10-2015)

Time : 2.00 p.m. to 4.00 p.m.

Time—Two Hours

Maximum Marks—40

N.B. :— (i) All questions carry equal marks and are compulsory.

(ii) Neat and well labelled diagrams wherever needed will carry marks.

1. Write on (any four) : 8

(i) Watson and Crick's DNA structure;

(ii) β -clamp and DNA pol III;

P.T.O.

- (iii) Non-Homologous recombination;
 - (iv) Generalised transduction;
 - (v) Definition of transposition;
 - (vi) Formation of Hfr cell.
2. Describe in brief (any two) : 8
- (i) Pol-I and Pol-II;
 - (ii) Editing function during replication;
 - (iii) Removal of primers after DNA replication.
3. Illustrate in brief (any two) : 8
- (i) Rec A and Rec BC proteins;
 - (ii) Hfr formation in conjugation;
 - (iii) Most accepted model for Genetic Recombination.
4. Take a detailed account (any one) : 8
- (i) Mechanism of transformation with respect to competence.
 - (ii) E.coli as an model genetic organism.

5. Write short notes on (any two) :

8

- (i) RNA as genetic material;
- (ii) SSB proteins;
- (iii) Semi-conservative DNA replication;
- (iv) F'-plasmid properties.

This question paper contains 2 printed pages]

AD—30—2015

FACULTY OF SCIENCE

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

OCTOBER/NOVEMBER, 2015

MICROBIOLOGY

Paper XIII

(Microbial Metabolism)

(Wednesday, 21-10-2015)

Time : 2.00 p.m. to 4.00 p.m.

Time—Two Hours

Maximum Marks—40

N.B. :- (i) Attempt All questions.

(ii) All questions carry equal marks.

(iii) Illustrate your answers with suitable diagram, graphs or schemes wherever necessary.

1. Attempt any *four* of the following :

8

(i) What is Coenzyme ?

(ii) Define anabolism.

(iii) Enlist functions of enzymes.

(iv) What is oxidative phosphorylation ?

(v) What is competitive inhibitor ?

(vi) Oxidoreductase.

P.T.O.

2. Attempt any *two* of the following : 8
- (i) Lock and key model of enzyme.
 - (ii) Explain effect of pH on enzyme activity.
 - (iii) Write on modes of ATP generation.
3. Attempt any *two* of the following : 8
- (i) Write on ED-pathway.
 - (ii) Applications of Lineweaver-Burk plot.
 - (iii) Write on competitive inhibition.
4. Attempt any *one* of the following : 8
- (i) Derive Michaelis-Menten equation.
 - (ii) Explain in detail RETC.
5. Write short notes on any *two* of the following : 8
- (i) Induced fit model
 - (ii) Enzyme specificity
 - (iii) Homolactic fermentation
 - (iv) Phosphoketolase pathway.

This question paper contains 3 printed pages]

AD—44—2015

FACULTY OF ARTS/SCIENCE

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

OCTOBER/NOVEMBER, 2015

MATHEMATICS

Paper XIII (MT-301)

(Metric Spaces)

(Friday, 20-11-2015)

Time : 2.00 p.m. to 4.00 p.m.

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) Define diameter of a non-empty set.

(b) Define a closed sphere of radius ' r ', centered at a point ' a ' in a metric space (x, d)

(c) Define complete metric space (x, d) .

(d) Define contraction mapping.

P.T.O.

(e) State Heine-Borel theorem.

(f) Define sequentially compact.

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

(a) In any metric space (x, d) , prove that the intersection of a finite number of open sets is open.

(b) Let A and B be any two subsets of a metric space (x, d) , then prove that $\overline{A \cup B} = \overline{A} \cup \overline{B}$.

(c) Show that the set \mathbb{R}^n of all ordered n -tuples with the function d defined by :

$$d(x, y) = \left(\sum_{i=1}^n (x_i - y_i)^2 \right)^{1/2}, \quad \forall x = (x_1, x_2, \dots, x_n),$$

$y = (y_1, y_2, \dots, y_n) \in \mathbb{R}^n$ is a metric space.

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

(a) Prove that every convergent sequence is a Cauchy sequence.

(b) Let (x, d_1) and (y, d_2) be two metric spaces, then prove that $F : x \rightarrow y$ is continuous if and only if $f^{-1}(G)$ is open in x , whenever G is open in y .

(c) If $f(x) = x^2$, $0 \leq x \leq \frac{1}{3}$, then prove that f is a contraction mapping on $\left[0, \frac{1}{3}\right]$ with the usual metric d .

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

- (a) Prove that every compact subset F of a metric space (X, d) is closed.
- (b) Prove that the union of two connected sets, having non-empty intersection is connected.
- (c) Let A be a non-empty compact subset of a metric space (X, d) and let F be a closed subset of X . Such that $A \cap F = \emptyset$, then prove that $d(A, F) > 0$.

This question paper contains 3 printed pages]

AD—52—2015

FACULTY OF ARTS/SCIENCE

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

OCTOBER/NOVEMBER, 2015

MATHEMATICS

Paper XIV (MT-302)

(Linear Algebra)

(Saturday, 21-11-2015) Time : 2.00 p.m. to 4.00 p.m.

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) Define subspace of vector space V .

(b) Define linear span of a non-empty subset of vector space V .

(c) If $a \in k$ then define a is algebraic over F .

P.T.O.

(d) What is the condition that the complex number is said to be an algebraic number ?

(e) Define an element T in $A(V)$ is invertible or regular.

(f) Define a linear transformation on V .

2. Attempt any *two* of the following :

5 each

(a) Prove that, $L(S)$ is a subspace of V .

(b) If V is finite-dimensional and W is a subspace of V , then prove that $A(A(W)) = W$.

(c) Prove that the intersection of two subspaces of V is a subspace of V .

3. Attempt any *two* of the following :

5 each

(a) If V is a finite-dimensional inner product space and W is a subspace of V , then prove that $(W^\perp)^\perp = W$.

(b) If $u, v \in V$, then prove that :

$$|(u, v)| \leq \|u\| \|v\|$$

(c) If W is a subspace of v and if $v \in V$ satisfies $(v, w) + (w, v) \leq (w, w)$ for every $w \in W$, then prove that $(v, w) = 0$ for every $w \in W$.

4. Attempt any *two* of the following :

5 each

(a) If V is finite-dimensional over F , then prove that $T \in A(V)$ is singular if and only if there exists $av \neq 0$ in v such that $vT = 0$.

(b) If $\lambda_1, \lambda_2, \dots, \lambda_k$ in F are distinct characteristic roots of $T \in A(V)$ and if v_1, v_2, \dots, v_k are characteristic vectors of T belonging to $\lambda_1, \lambda_2, \dots, \lambda_k$ respectively, then prove that v_1, v_2, \dots, v_k are linearly independent over F .

(c) Compute the following matrix products :

$$\begin{pmatrix} \frac{1}{3} & \frac{1}{3} & \frac{1}{3} \\ \frac{1}{3} & \frac{1}{3} & \frac{1}{3} \\ \frac{1}{3} & \frac{1}{3} & \frac{1}{3} \end{pmatrix}^2$$

This question paper contains 4 printed pages]

AD—223/224—2015

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2015

COMPUTER SCIENCE

Paper XIII

(Relational Database Management System)

Or

(E-commerce)

(Wednesday, 16-12-2015)

Time : 2.00 p.m. to 4.00 p.m.

Time—Two Hours

Maximum Marks—40

(Relational Database Management System)

N.B. :— (i) Attempt All questions.

(ii) All questions carry equal marks.

(iii) Draw well labelled diagrams wherever necessary.

1. Solve any *four* of the following :

8

(i) What are the advantages of DBMS ?

P.T.O.

- (ii) Define events.
 - (iii) What do you mean by DDL ?
 - (iv) Explain cluster.
 - (v) Define objects.
 - (vi) What is error handling ?
2. Attempt any *two* of the following : 8
- (a) Explain the concept of Integrity.
 - (b) What do you mean by transaction ?
 - (c) Explain the concept of Recovery.
3. Attempt any *two* of the following : 8
- (a) What is DML ?
 - (b) Explain integrated applications in detail.
 - (c) Explain group by command with example.
4. Attempt any *one* of the following : 8
- (a) Explain in detail program to retrieve and save data.
 - (b) Explain the concept of distributed database in detail.
5. Write short notes on any *two* : 8
- (a) Queries

WT

(3)

AD—223/224—2015

- (b) Procedural language
- (c) Custom reports
- (d) Joins.

OR

(E-commerce)

N.B. :— (i) Attempt All questions.

(ii) All questions carry equal marks.

(iii) Draw well labelled diagrams wherever necessary.

1. Attempt any *four* of the following :

8

- (i) Explain advantages of E-commerce.
- (ii) Define internet.
- (iii) What is digital library ?
- (iv) What is definition of network ?
- (v) What is firewall ?
- (vi) Define client/server technology.

2. Attempt any *two* of the following :

8

- (a) Explain the concept of World Wide Web.
- (b) Explain the applications of EDI in business.
- (c) What is electronic payment system ?

P.T.O.

3. Attempt any *two* of the following : 8
- (a) Explain concept of message security.
 - (b) Explain use of firewall in network security.
 - (c) Explain the concept of 1-way in detail.
4. Attempt any *one* of the following : 8
- (a) Explain the use and working of electronic mail system.
 - (b) Explain data and message security in detail.
5. Write short notes on any *two* of the following : 8
- (a) Internet
 - (b) EDI
 - (c) Server
 - (d) Consumer oriented E-commerce.

This question paper contains 3 printed pages]

AD—52—2015

FACULTY OF ARTS/SCIENCE

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

OCTOBER/NOVEMBER, 2015

MATHEMATICS

Paper XIV (MT-302)

(Linear Algebra)

(Saturday, 21-11-2015)

Time : 2.00 p.m. to 4.00 p.m.

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) Define subspace of vector space V .

(b) Define linear span of a non-empty subset of vector space V .

(c) If $a \in k$ then define a is algebraic over F .

P.T.O.

- (d) What is the condition that the complex number is said to be an algebraic number ?
- (e) Define an element T in $A(V)$ is invertible or regular.
- (f) Define a linear transformation on V .
2. Attempt any *two* of the following : 5 each
- (a) Prove that, $L(S)$ is a subspace of V .
- (b) If V is finite-dimensional and W is a subspace of V , then prove that $A(A(W)) = W$.
- (c) Prove that the intersection of two subspaces of V is a subspace of V .
3. Attempt any *two* of the following : 5 each
- (a) If V is a finite-dimensional inner product space and W is a subspace of V , then prove that $(W^\perp)^\perp = W$.
- (b) If $u, v \in V$, then prove that :
- $$|(u, v)| \leq \|u\| \|v\|$$
- (c) If W is a subspace of v and if $v \in V$ satisfies $(v, w) + (w, v) \leq (w, w)$ for every $w \in W$, then prove that $(v, w) = 0$ for every $w \in W$.

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

(a) If V is finite-dimensional over F , then prove that $T \in A(V)$ is singular if and only if there exists $av \neq 0$ in v such that $vT = 0$.

(b) If $\lambda_1, \lambda_2, \dots, \lambda_k$ in F are distinct characteristic roots of $T \in A(V)$ and if v_1, v_2, \dots, v_k are characteristic vectors of T belonging to $\lambda_1, \lambda_2, \dots, \lambda_k$ respectively, then prove that v_1, v_2, \dots, v_k are linearly independent over F .

(c) Compute the following matrix products :

$$\begin{pmatrix} \frac{1}{3} & \frac{1}{3} & \frac{1}{3} \\ \frac{1}{3} & \frac{1}{3} & \frac{1}{3} \\ \frac{1}{3} & \frac{1}{3} & \frac{1}{3} \end{pmatrix}^2$$

This question paper contains 3 printed pages]

AH—04—2015

FACULTY OF COMPUTER SCIENCE

B.Sc. (C.S.) (Third Year) (Fifth Semester) EXAMINATION

OCTOBER/NOVEMBER, 2015

(Revised Course)

COMPUTER SCIENCE

Paper S5.1

(Cyber Security)

(Thursday, 19-11-2015)

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. Attempt the following :

20

(a) Explain technology behind digital signature.

(b) Explain asymmetric cryptography.

(c) Explain hacking with computer system.

(d) Explain digital signature and law.

P.T.O.

WT

(2)

AH-04-2015

2. (a) Explain jurisdiction in trademark dispute. 8

(b) Explain offences related to digital signature certificate. 7

Or

(c) Explain PKI in detail. 8

(d) Explain object and scope of I.T. Act. 7

3. (a) Explain tampering with computer source document. 8

(b) Explain establishment and composition of appellate tribunal. 7

Or

(c) Explain RSA algorithm. 8

(d) Explain reverse hijacking. 7

4. (a) Explain power of adjudicating officer to impose penalty. 8

(b) What is domain name ? Explain concept of domain name. 7

Or

(c) Explain the following : 8

(i) Cyber squatting;

(ii) Framming.

(d) Explain public key encryption. 7

5. Write short notes on (any three) :

15

- (a) Genesis;
- (b) Keyword Banners;
- (c) Meta tags;
- (d) Spamming;
- (e) Publishing of information which is absence in electronic form.

This question paper contains 3 printed pages]

AH—10—2015

FACULTY OF COMPUTER STUDIES

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

OCTOBER/NOVEMBER, 2015

(Revised Course)

COMPUTER SCIENCE

(Digital Image Processing)

(Monday, 26-10-2015)

Time : 10.00 a.m. to 1.00 p.m.

Time—Three Hours

Maximum Marks—80

N.B. :— (i) Assume suitable data if necessary.

(ii) Figures to the right indicate full marks.

1. Attempt the following : 20
- (a) Explain advantages of DIP.
 - (b) Explain 32 bit color image.
 - (c) Explain concept of data classes.
 - (d) Discuss concept of visual perception.

P.T.O.

2. (a) Explain concept of adaptation. 8
- (b) Explain concept of M function. 7
- Or*
- (c) Discuss function plotting in detail. 8
- (d) Explain concept of Histogram. 7
3. (a) Explain 2D-discrete Fourier transformation. 8
- (b) Discuss statistical background of DIP. 7
- Or*
- (c) Discuss concepts of noise models. 8
- (d) Explain image restoration process in detail. 7
4. (a) Explain disadvantages of MATLAB. 8
- (b) Explain concept of image registration. 7
- Or*
- (c) Explain concept of MATLAB scratch pad. 8
- (d) Explain concept of multidimensional array. 7

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

15

- (a) Writing images
- (b) Reading images
- (c) Scalar
- (d) Background of intensity transformation
- (e) Command window.

This question paper contains 3 printed pages].

AH—28—2015

FACULTY OF COMPUTER STUDIES

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

NOVEMBER/DECEMBER, 2015

(Revised Course)

COMPUTER SCIENCE

(Oracle 10g SQL and PL/SQL)

(Saturday, 5-12-2015)

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.

1. Attempt the following : 20
 - (a) Explain E-R data model.
 - (b) Explain data types in SQL.
 - (c) Explain conversion function with example.
 - (d) Explain comparison operators with example.

P.T.O.

2. (a) What is subquery ? Explain types of subquery. 8

(b) Explain creating user with example. 7

Or

(c) Explain PL/SQL structure. 8

(d) What is trigger and explain syntax of trigger ? 7

3. (a) Explain group by and having clause with example. 8

(b) Explain users of DBMS. 7

Or

(c) Explain condition logic in PL/SQL with example. 8

(d) Explain DML with example. 7

4. (a) Explain creating and managing tables. 8

(b) Explain wanting and revoking roles. 7

Or

(c) What is view ? Explain creating, updating and altering view. 8

(d) Explain character function with example. 7

5. Write short notes on any *three* of the following :

15

- (a) DDL
- (b) Distinct and where clause
- (c) TCL
- (d) Relational data model
- (e) Order by clause.

This question paper contains 3 printed pages]

AH—22—2015

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2015

(Revised Course)

COMPUTER SCIENCE

Paper S5.3

(Programming in Java-I)

(Thursday, 3-12-2015)

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 suitable data, if necessary.

(iii) Figures to the right indicate full marks.

1. Attempt the following :

20

(a) Write down features of Java.

(b) Explain datatypes in Java.

(c) Use of 'this' keyword.

(d) What are access specifiers ?

P.T.O.

2. (a) Write down comparison of Java and C++. 8
- (b) Explain constructor and overloading constructor with example. 7
- Or*
- (c) Explain control statement in detail. 8
- (d) Explain classes and objects. 7
3. (a) Explain inheritance with superclass, subclass and extend keyword. 8
- (b) Explain interface with example. 7
- Or*
- (c) Explain try.....catch statement. 8
- (d) Explain MVC architecture. 7
4. (a) What is AWT ? Differentiate AWT and swing. 8
- (b) Explain applet life cycle. 7

Or

- (c) Write a program in Java to display your biodata. 8
- (d) Explain function for reading and writing characters in file. 7
5. Write short notes on (any three) : 15
- (i) Final keyword;
 - (ii) Applet HTML tag;
 - (iii) Java program structure;
 - (iv) Abstract class
 - (v) Super keyword.

This question paper contains 3 printed pages]

AH—16—2015

FACULTY OF COMPUTER STUDIES

B.Sc. (C.S.) (Third Year) (Fifth Semester) EXAMINATION

OCTOBER/NOVEMBER, 2015

(Revised Course)

COMPUTER SCIENCE

Paper S5.2

(Cloud Computing)

(Tuesday, 24-11-2015)

Time : 10.00 a.m. to 1.00 p.m.

Time—Three Hours

Maximum Marks—80

N.B. :— (i) Assume suitable data if necessary.

(ii) Figures to the right indicate full marks.

1. Attempt the following :

20

(a) Explain disadvantages using cloud.

(b) What are web enabled applications ?

(c) Explain rest in detail.

(d) Explain advantages of Dev-2.0.

P.T.O.

2. (a) Explain client server architecture in detail. 8
- (b) Discuss google app engine in detail. 7
- Or*
- (c) Explain concept of PaaS in detail. 8
- (d) Explain concept of relational databases. 7
3. (a) Explain the concept of AJAX. 8
- (b) Explain concept of enterprise batch processing. 7
- Or*
- (c) Explain concept of HBase in detail. 8
- (d) What do you mean by relational operations ? 7
4. (a) Explain user interface services in detail. 8
- (b) Discuss applicability of Dev-2.0. 7
- Or*
- (c) Explain concept of IaaS in detail. 8
- (d) Explain GES cloud file system. 7

5. Write short notes on (any three) :

15

- (a) Dynamo;
- (b) SaaS;
- (c) Cloud computing applications;
- (d) Internet;
- (e) Web application server.

This question paper contains 2 printed pages]

AD—222—2015

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2015

(Revised Course)

COMPUTER SCIENCE

Paper XII

(Software Engineering)

(Tuesday, 15-12-2015) Time : 2.00 p.m. to 4.00 p.m.

Time—2 Hours

Maximum Marks—40

N.B. :— (i) Attempt All questions.

(ii) Assume suitable data if necessary.

1. Attempt any *four* of the following : 8
- (a) Define 'Software' and 'Software Engineering'.
 - (b) Explain the concept of 'Abstraction' in brief.
 - (c) Explain the concept of staffing level estimation in brief.
 - (d) What are programming guidelines ?
 - (e) Explain 'verification' and 'validation'.
 - (f) What is 'software maintenance' ?

P.T.O.

2. Attempt any *two* of the following : 8
- (a) Discuss the managerial issues for software project.
 - (b) Explain in detail project structure.
 - (c) What is static analysis ? Explain.
3. Attempt any *two* of the following : 8
- (a) Explain integration testing.
 - (b) Explain McCabe's cyclometric metric.
 - (c) Explain the concept of Coupling and Cohesion.
4. Attempt any *one* of the following : 8
- (a) Explain in detail quality and productivity factors.
 - (b) Discuss the languages and processor for requirement specification.
5. Write short notes on (any *two*) : 8
- (a) Milestones, Documents and Reviews;
 - (b) Software Cost Factors;
 - (c) Software Requirement Specification;
 - (d) Internal Documentation.