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B.Sc. (Part - III) (Semester - V) Examination, April - 2014

BOTANY (Paper - XII)

Plant Biochemistry

Sub. Code : 54901

Day and Date : Wednesday, 09 - 04 - 2014 **Total Marks :40**

Time : 3.00 p.m. to 5.00 p.m.

Instructions : 1) All questions are compulsory.

2) Figures to the right indicate full marks.

3) Draw neat labelled diagrams wherever necessary.

Q1) Rewrite the following sentences by choosing correct alternative. **[8]**

a) The primary source of synthesis of carbohydrate in plants is _____.

i) Fat

ii) Protein

iii) CO_2 of atmosphere through photosynthesis

iv) Lipid

b) Palmitic acid contains _____.

i) 14-C atoms ii) 16-C atoms

iii) 18-C atoms iv) 20-C atoms

c) _____ is called left handed DNA.

i) B-form ii) C-form

iii) Z-form iv) A-form

d) _____ polysaccharide is the most abundant organic substance on earth.

i) Chitin ii) Cellulose

iii) Starch iv) Inulin

e) _____ is not a sugar.

i) Starch ii) Ribose

iii) Glucose iv) Sucrose

f) Proteins formed by the action of enzymes, acids or alkalies on natural proteins are known as _____.

i) Simple proteins ii) Conjugated proteins

iii) Derived proteins iv) Amino acids

g) A nucleoside becomes a nucleotide by the attachment of a _____.

i) Pentose sugar ii) Phosphate group

iii) Deoxyribose sugar iv) Purines

h) _____ is a heterocyclic amino acid.

i) Alanine ii) Proline

iii) Aspartate iv) Lysine

Q2) Attempt any two of the following : **[16]**

a) Describe the mechanism of biosynthesis and degradation of starch.

b) Describe the β-oxidation pathway of fatty acids.

c) Give the structure and properties of amino acid.

Q3) Attempt any four of the following : **[16]**

a) Epimers.

b) Polysaccharides.

c) Phospholipid.

d) Post translational modifications in protein.

e) Structure of DNA - B - form.

f) Significance of Carbohydrates.

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Total No. of Pages : 2

B.Sc. (Part - III) (Semester-V) Examination, April - 2014

CHEMISTRY (Paper-XII)

Analytical Chemistry (New)

Sub. Code : 59895

Day and Date : Wednesday, 09 - 04 - 2014 **Total Marks : 40**

Time : 3.00 p.m. to 5.00 p.m.

Instructions : 1) **All questions are compulsory.**
2) **Draw neat and labeled diagrams wherever necessary.**
3) **Figures to the right indicate full marks.**

Q1) Select the most correct alternative and rewrite the sentence: **[8]**

a) Optical density, D is given by_____.

i) $D = \log I/I_o$ ii) $D = \log I_o/I$

iii) $D = \log I/I$ iv) $D = \log I_o/I_o$

b) When the end points of potentiometric titrations are determined by plotting the graph of $\Delta E/\Delta V$ Vs.volume of titrant, it is called_____.

i) First derivative method ii) Second derivative method

iii) Third derivative method iv) Fourth derivative method

c) The process in which foreign ions are trapped and surrounded by successive layers during the crystal growth is known as _____.

i) Crystallisation ii) Co-precipitation

iii) Occlusion iv) Inclusion

d) Eriochrome Black T is also known as _____.

i) Solochrome Black ii) Molochrome Black

iii) Acid - base indicator iv) Monochrome Black T

e) The catalytic activity of zeolites is due to the presence of _____ centres in their intra-crystalline surface.

i) Neutral ii) Phenol

iii) Acid iv) Base

P.T.O.

f) In column chromatography the alumina used acts as_____.

i) Adsorbent ii) Organic phase

iii) Aqueous phase iv) Porous material

g) Passivity producing reagents are_____.

i) Lewis bases ii) Buffering agents

iii) Reducing agents iv) Oxidising agents

h) In corrosion, at cathode_____ gas is evolved.

i) N_2 ii) H_2

iii) O_2 iv) CO_2

Q2) Attempt any two of the following: **[20]**

a) Give construction, working of Quinhydrone electrode. Discuss how is it used in determination of P^H of the given solution.

b) i) Explain Friedel craft's alkylation reactions using zeolite catalysts.

ii) Discuss in brief biocatalytic hydroxylation reactions.

c) What is corrosion? Discuss in detail electro chemical theory of corrosion. Mention different methods of prevention of corrosion.

Q3) Attempt any three of the following: **[12]**

a) Draw a schematic diagram of single cell photoelectric colorimeter.

b) Differentiate Co-precipitation and post precipitation.

c) Write the structures of benzoid and quinoid forms of the phenol phthalein and methyl orange.

d) Give applications of Gas chromatography.

e) Explain Lambert- Beer's law.

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B.Sc. (Part - III) (Semester - V) Examination, April - 2014
ELECTRONICS (Paper - XII)
Electronic Instrumentation
Sub. Code : 54931

Day and Date : Wednesday, 9 - 04 - 2014 **Total Marks : 40**
Time : 3.00 p.m. to 5.00 p.m.

Instructions :
1) **All questions are compulsory.**
2) **Figures to the right indicate full marks.**
3) **Use of log table, calculator is allowed.**
4) **Draw neat diagrams wherever necessary.**

Q1) Select the correct alternative : **[8]**

a) _____ is a measure of the consistancy or repeatability of measurement.
- i) Precision
- ii) Accuracy
- iii) Error
- iv) Resolution

b) Parallax error introduced in reading a meter scale is_____ type of error .
- i) Instrumental
- ii) Observational
- iii) Environmental
- iv) Gross

c) The material used for piezoelectric transducer is_____ .
- i) Iron
- ii) Carbon
- iii) Quartz
- iv) Copper

d) _____ is a linear process used in the signal conditioning equipment.
- i) Modulation
- ii) Demodulation
- iii) Rectification
- iv) Amplification

e) To measure the speed of rotating shaft ____ is used.
- i) Tachometer
- ii) Potentiometer
- iii) Multimeter
- iv) pH meter

f) The dual trace oscilloscope has_____ cathode ray gun.
- i) Two
- ii) One
- iii) Three
- iv) Four

g) LED____ light.
- i) Scatters
- ii) Refracts
- iii) Emits
- iv) Polarizes

h) LVDT is a ____ type of transducer.

i) Active ii) Resistive

iii) Capacitive iv) Passive

Q2) Attempt any TWO: **[16]**

a) Explain the working of LVDT with neat diagrams and mention its advantages.

b) With circuit diagram, explain the instrumentation amplifier using transducer bridge.

c) With the block diagram, explain the working of digital multimeter.

Q3) Attempt any FOUR: **[16]**

a) Explain the shielding techniques used in instruments.

b) Explain the working principle of thermocouple.

c) Give the transducer selection factors.

d) With the help of block diagram, explain the X-Y recorder.

e) Explain the operation of digital voltmeter.

f) Explain the working of capacitive transducer.

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B.Sc. (Part-III) (Semester-V) Examination, April-2014
MICROBIOLOGY (Paper-XII)
Agricultural Microbiology
Sub. Code : 54926

Day and Date : Wednesday, 09 - 04 - 2014 **Total Marks : 40**

Time : 3.00 p.m. to 5.00 p.m.

Instructions :
1) **All questions are compulsory.**
2) **Figures to the right indicate full marks.**
3) **Draw neat labelled diagrams wherever necessary.**

Q1) Rewrite the sentence by selecting correct alternative: **[8]**

a) Nodulation text is important in the confirmation of _____ isolate.

i) Azospirillium ii) Rhizobial

iii) Azotobacter iv) Xanthomonas

b) In nitrification ammonia is oxidised to _____.

i) Nitrate ii) Ammonium nitrite

iii) Nitriles iv) Nitride

c) The causative agent of citrus canker is _____.

i) Cercospora personata ii) Xanthomonas sps

iii) Pseudomonas sps iv) Bacillus sps

d) This is the type of synthesis which benefits one species and other species is unaffected is _____.

i) commensalism ii) Ammensalism

iii) Synergism iv) Predation

e) _____ is an organic manure artificially prepared from plant residues and animal waste products.

i) Manure ii) Humus

iii) Town compost iv) Organic soil

P.T.O.

f) Heterocyst is present in _____.

i) Protozoa ii) Viruses

iii) Blue green algae iv) Azatobacter

g) Black colour in soil is caused due to presence of _____ and manganese oxides.

i) Iron oxides ii) Hydrated iron oxide

iii) Iron sulfide iv) Quartz

h) The symbioyant remain internal to the cells of its host is called _____.

i) Ectosymbiont ii) Exosymbiont

iii) Endosymbiosis iv) None of the above

Q2) Attempt any Two of the following: **[16]**

a) Define pesticides? Give in brief account of bacterial pesticides of B.thuringenesis.

b) Describe in brief main features of carbon cycle.

c) What are biofertilisers? Describe in brief production, isolation, carrier methods, packing methods and applications of rhizobium inoculants.

Q3) Answer the following (Any Four): **[16]**

a) Physical characteristics of soil-any four.

b) Green manure.

c) Common symptoms produced by plant pathogens.

d) Bacterial blight of pomegranate.

e) Commensalism.

f) Mechanism of phosphate solubilization.

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Total No. of Pages :2

B.Sc. (Part - III) (Semester - V) Examination, April - 2014
MATHEMATICS (Paper -XII (C))
Differential Geometry - I
Sub. Code : 54883

Day and Date : Wednesday, 09 - 04 - 2014 **Total Marks : 40**
Time : 3.00 p.m. to 5.00 p.m.

Instructions : 1) **All questions are compulsory.**
2) **Figures to the right indicate full marks.**

Q1) Select the correct alternatives for each of the following: **[8]**

a) The normal which lies in osculating plane at any point of a curve is called _____.

i) principal normal ii) Bi-normal

iii) tangent iv) none of these

b) The rectifying plane containing b and t then its equation is _____.

i) $(R\text{-}r)\cdot b = 0$ ii) $(R\text{-}r)\cdot t = 0$

iii) $(R\text{-}r)\cdot n = 0$ iv) $(R\text{-}r) = 0$

c) The curvature K = _____.

i) $\dfrac{|\dot{r} \times \ddot{r}|}{\dot{s}^3}$ ii) $\dfrac{|\dot{r} \times \ddot{r}|}{\dot{s}^2}$

iii) $\dfrac{|\dot{r} \times \ddot{r}|}{\dot{s}}$ iv) $\dfrac{|\dot{r} \times \ddot{r}|}{s}$

d) The arc rate at which the principal normal changes direction as P(r) moves along the curve is called the _____ vector.

i) screw curvature ii) curvature

iii) Torsion iv) none of these

e) The scalar triple product of vectors N, r_1, r_2 has the value _____.

i) E ii) F

iii) G iv) H

P.T.O.

f) The cross product of N with r_1 is _____.

i) $[Fr_1\text{-}Er_2]$ ii) $\frac{1}{H}[Fr_1 - Er_2]$

iii) Er_2 iv) Fr_1

g) Through every point of the surface there passes _____ parametric curves of each system.

i) two ii) three

iii) one and only one iv) four

h) $[N, N_1, r_2]$ = _____

i) $(FM - GL)/H$ ii) $(FM + GL)/H$

iii) FM/H iv) GL/H

Q2) Attempt any <u>two</u> out of three : **[16]**

a) Define second fundamental form and give its geometrical interpretation.

b) Define evolute and derive the equation of evolute.

c) Derive the Weingarton equations.

Q3) Attempt any <u>four</u> out of six: **[16]**

a) Find the length of one complete turn of the circular helix

$r = a \cos u\, i + a \sin u\, j + cu\, k$, $-\infty < u < \infty$.

b) For the curve $x = 3t, y = 3t^2, z = 2t^3$, show that any plane meets it in three points and deduce the equation to the osculating plane at $t=t_1$.

c) Calculate the fundamental magnitudes for the right helicoid given by $x = u \cos v, y = u \sin v, z = cv$.

d) Deduce the formula $HN \times N_1 = Mr_1 - Lr_2$.

e) Calculate the curvature of the cubic curve given by $r = (u, u^2, u^3)$.

f) For the paraboloid $r = (u, v, u^2\text{-}v^2)$, find the metric.

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Total No. of Pages : 2

B.Sc. (Part - III) (Semester-V) Examination, April - 2014

PHYSICS (Paper-XII) (Revised)

Atomic Physics, Astronomy & Astro Physics (New)

Sub. Code : 59873

Day and Date : Wednesday, 09 - 04 - 2014 **Total Marks : 40**

Time : 3.00 p.m, to 5.00 p.m.

Instructions :
1) **All questions are compulsory.**
2) **Figures to the right indicate full marks.**
3) **Neat diagrams should be drawn wherever necessary.**
4) **Use of calculator or logarithmic table is allowed.**

Q1) Select correct alternative: **[8]**

a) Rotational kinetic energy of J-level of diatomic molecule is proportional to _____.

i) J(J+1) ii) moment of inertia iii) both (i) & (ii)

b) If the coupling between *l** and s* is not broken in an external magnetic field, then we observe _____ effect.

i) Normal zeeman

ii) Anomalous zeeman

iii) Paschen - Back

c) The doublet separation increases with _____ number.

i) atomic ii) mass iii) principal quantum

d) Raman shift for anti-Stoke's lines is _____.

i) positive ii) negative iii) zero

e) Raman shift generally lies in _____ region.

i) visible ii) infra-red iii) ultra-violet

f) The atmosphere of Mars mainly contains(90%) _____.

i) CO_2 ii) Nitrogen iii) Oxygen

P.T.O.

g) Hubble's law can be stated as _____.

i) $V \propto x$ ii) $V \propto x^2$ iii) $V \propto \frac{1}{x}$

h) Sun and solar system was formed before _____ years.

i) 4.6 billion ii) 10 billion iii) 2.6 billion

Q2) Attempt Any Two: **[16]**

a) What is Paschen's- Back effect? Obtain an expression for the term value.

b) Give the classical theory of Raman effect and show that Raman shift is equal to

i) Frequency of vibration of molecule.

ii) Double the frequency of vibration of molecule.

c) Explain the following cosmological theories.

i) Big -Bang

ii) Steady state

Q3) Attempt Any Four: **[16]**

a) What is the nature of wave function of H_2- molecule.

b) Write note on electron spin orbit interaction.

c) Distinguish between Raman spectra and infra-red spectra.

d) What are sun spots? List the salient feature of sun spot.

e) Explain planetary properties of Mars.

f) Describe the properties of Milky way galaxy.

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B.Sc. (Part - III) (Semester - V) Examination, April - 2014

STATISTICS (Paper - XII)

Programming in C

Sub. Code : 54913

Day and Date : Wednesday, 09 - 04 - 2014 **Total Marks :40**

Time : 3.00 p.m. to 5.00 p.m.

Instructions : 1) All questions are compulsory.

2) Figures to the right indicate full marks.

Q1) Choose the correct alternative from given four alternatives. **[8]**

a) The quantities 8', 8' and "8" are respectively called as

i) character constant, integer constant, string constant

ii) integer constant, character constant, string constant

iii) string constant, integer constant, character constant

iv) integer constant, string constant, character constant

b) Which of the following is allowed in a 'C' arithmetic expression?

i) [ ] ii) { }

iii) ( ) iv) None of the above

c) If a = 11, b = 10 and c = 61 then the value of the expression (a + c) < b is

i) 0 ii) 1

iii) 72, 10 iv) None of the above

d) Which of the following loop will execute at least once?

i) for ii) while

iii) do while iv) none of the above

e) Which of the following is an assignment operator in 'C'?

i) = = ii) +

iii) & iv) =

f) Out of following operators which is the unary operator?

i) * ii) /

g) Value of the pointer variable is

i) float ii) address

iii) integer iv) depends on declaration

h) Consider the statement int *p. then which of the following statement is not true?

i) value of p is address ii) value of *p is integer

iii) value of p is integer iv) none of the above

Q2) Attempt any two of the following : **[16]**

a) Explain for ( ) loop and using it write a C program to find and print mean, variance and S.D of 25 integers.

b) Illustrate the string functions

i) strlen( ) ii) strcmp( )

iii) strcpy( ) iv) strrev( )

c) Explain (with one example for each) while ( ) loop and switch ( ) statement.

Q3) Attempt any four of the following : **[16]**

a) Write C statements for the following

i) To assign the values to integer variables i and ii as 23 and 67 respectively in declaration itself.

ii) To increase the variable z by 20.

iii) To print float variables x, y and z on same line using single printf statement.

iv) X is pointer variable which points float.

b) Write a C program to print the identify matrix of order n.

c) Write note on pointers using declaration, initialization, accessing address.

d) Explain arithmetic operators and arithmetic expressions.

e) Explain the operators ++ and – –.

f) Write a C program to find and print the value of n factorial using self defined function.

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Total No. of Pages : 2

B.Sc. (Part - III) (Semester - V) Examination, April - 2014
ZOOLOGY (Paper - XII)
(Under Restructured Course)
Endocrinology, Environmental Biology and Toxicology (New) (Revised)
Sub. Code : 59862

Day and Date : Wednesday, 09 - 04 - 2014 **Total Marks :40**

Time : 3.00 p.m. to 5.00 p.m.

Instructions : 1) All questions are compulsory.

2) Figures to the right indicate full marks.

3) Neat and labeled diagrams must be drawn wherever necessary.

Q1) Select the correct alternative from the given options and rewrite the sentences. **[8]**

a) Marine water animals solve the osmotic problems by _____.

i) endosmosis ii) exoosmosis

iii) endo and exoosmosis iv) excretion

b) Impervious and hygroscopic skin is found in _____.

i) Kangaroo rat ii) Moloch horridus

iii) Rattle snake iv) Oryx

c) The variability among living organisms is called _____.

i) population ii) biological diversity

iii) ecosystem iv) ecology

d) Appearance of large amount of glucose in urine is found due to the ___.

i) diabetes mellitus ii) tetany

iii) cardiac failure iv) vitamin deficiency

e) The neurological syndrome caused by mercury poisoning is called ___.

i) Minimata disease ii) Hutter's snake

iii) Nephritis iv) Painter's colica

f) Adrenal medulla secretes _____ harmones.

i) Sex harmones

ii) Aldosterone

iii) Epinephrine & nor epinephrine

iv) Glucocorticoids

g) Harmones acts on target tissues by activating the _____.

i) tissues ii) cells

iii) organs iv) receptors

h) Kaziranga National Park is well known for conservation of _____.

i) Rhinoceros ii) Lion

iii) Tiger iv) Elephant

Q2) Attempt any two of the following : **[16]**

a) Describe the structure of adrenal gland and explain the role of adrenal cortical harmones.

b) What is biodiversity? Explain in brief different types of conservation methods of biodiversity.

c) Define lentic habitat? Explain in brief characteristics and faunal adaptations of pond.

Q3) Attempt any four of the following : **[16]**

a) Explain in brief the role of insulin.

b) Describe in brief Tadoba sanctuary.

c) Explain in brief the role of thyroxin.

d) Explain in brief the mechanism of hormonal actions.

e) Describe in brief Hg toxicity.

f) Explain characteristics of grassland habitat.

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