

B.Sc. (Sem.-5) Examination

CC 301

Environmental Science

March 2019

[Max. Marks : 70]

Time : 2-30 Hours]

- Que 1(A) Explain Ecological pyramids with examples (14)
OR
- (A)1 Write short note on Ecological Niche and guild (7)
2 Explain Food Chain and Food web (7)
- (B) Short Question any four (4)
1. Plants able to synthesize their own food substances are called?
 2. Wetlands appear in every biome except
 3. Which the continent experiencing the greatest losses from land degradation?
 4. Paul Ehrlich of Stanford University thinks the impact of humanity on Earth is determined by
 5. Brown tree snake and the zebra mussel exported to foreign soils comes under which red book category?
 6. Range of animal and plant species and the genetic variability of these species are referred to as
- Que 2(A) Discuss Characteristics of Marine Adaptation (14)
OR
- (A)1 Describe adaptation in Desert and Savannah (7)
2 Explain Temperate and Tropical Forests (7)
- (B) Short Question any four (4)
1. Which one of the following is not a functional unit of an ecosystem?
 2. In which ecosystem the upright pyramid of number is absent?
 3. Which is the type of ecosystem with the highest mean plant productivity?
 4. Which Trophic level is equivalent to cows in grasslands in an aquatic ecosystem?
 5. What is the final stable community in ecological succession called?
 6. Trophic levels in ecosystem is formed by _____
- Que 3(A) Explain different types of Succession process (14)
OR
- (A)1 Explain Mutualism and Commensalism (7)
2 Describe primary and secondary processes in successions (7)
- (B) Short Question any three (3)
1. Plants respond to their in many ways
 2. The response of a plant to a stimulus is called tropism. (True / False)
 3. In which type of interaction do both species benefit?
 4. An organism's specific role in its habitat is called
 5. In which relationship species benefits and the other is neither helped nor harmed?
- Que 4(A) Explain mechanism of adaptation to environmental stresses (14)
OR
- (A)1 Write short note on Hydrophytes and Xerophytes (7)
2 Write short note on Halophytes and Mesophytes (7)
- (B) Short Question any Three (3)
1. Changes that make an organism better suited to their environments is developed through a process called
 2. Which process does Bears do in winter?
 3. The disappearance of all the members of a species is called
 4. What is natural selection?
 5. What is Adaptation?

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Bio-Chemistry

March 2019

Time : 2-30 Hours]

[Max. Marks : 70

Q1(A). Discuss degradation of Glycogen in detail along with the hormonal regulation of it. (14)

OR

Q1(A)(i). Describe the irreversible reactions of Glycolysis in detail. (07)

(ii). What is the significance of pentose phosphate pathway? Discuss in detail. (07)

Q1(B). Answer any four: (04)

1. Write the complete reaction catalyzed by the key enzyme of Glycogenesis.
2. Define Gluconeogenesis. Where does it occur in our body?
3. Name the two enzymes responsible for oxidation reactions in Pentose phosphate pathway.
4. What is lactose fermentation & when does it occur?
5. Name the deficient enzymes in Galactosemia.
6. Name different precursors of Gluconeogenesis.

Q2(A). Describe Urea cycle with reference to its localization, reactions, energetic & regulation. (14)

OR

Q2(A)(i). Discuss the synthesis of Creatine in detail. What is the importance of Creatine? (07)

(ii). Discuss the role of Glutamate, Glutamine & Alanine in amino acid catabolism. (07)

Q2(B). Answer any four: (04)

1. What are Ammonotelic organisms and name one such organism.
2. Define Transdeamination.
3. What is the protein metabolic end product in monkeys, snakes, and ameba?
4. Write the structure of Glutathione.
5. Name the defective enzyme in Phenylketonuria disease. What reaction does it catalyze?
6. Write any one oxidative Deamination reaction of amino acids.

Q3(A). Describe the synthesis of Phospholipids: Phosphatidylcholine and Posphatidylethanolamine in detail. (14)

OR

Q3(A)(i). Discuss oxidation of Palmitic acid in detail with reference to its localization & reations. (07)

(ii). Discuss the synthesis of ketone bodies & give its significance. (07)

Q3(B). Answer any three: (03)

1. Name any two in-born errors of lipid metabolism.
2. Name the hormones involved in regulation of lipid catabolism.
3. Write the structure of a Sphingomyelin.

4. Write any two enzymes of Fatty Acid Synthase Complex.
5. How many molecules of acetyl CoA² formed when oleic acid is degraded & why?

Q4(A). Discuss TCA Cycle in detail with complete reactions, structures and energetics. (14)

OR

41(A)(i). Discuss Aspartate- Malate Shuttle. (07)

(ii). Describe Chemiosmotic hypothesis for oxidative phosphorylation. List the evidences to support it. (07)

Q4(B). Answer any three: (03)

1. Name the enzyme involved in respiratory oxidative phosphorylation. Where is it located in eukaryotic cell?
2. Name any two inhibitors of Electron Transport Chain.
3. What are Anaplerotic reactions of TCA Cycle?
4. Name the deficient enzyme in Glycogen Storage Type -I Disease ?
5. Name the enzymes of Pyruvate Dehydrogenase complex in mammals

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Statistics

Time : 2-30 Hours]

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[Max. Marks : 70

Question (A) carries 14 marks and Question (B) carries 1 mark each.

1. (A) (i) Define Negative Binomial distribution. Obtain its moment generating function. Hence find mean and variance of negative binomial distribution.
(ii) Let two independent random variables X_1 and X_2 have same geometric distribution. Show that the conditional distribution of $X_1/(X_1 + X_2)$ is uniform.

OR

- (i) Define geometric distribution. Obtain its cumulant generating function. Hence find mean and variance of geometric distribution.
(ii) Show that Poisson distribution as a limiting case of Negative Binomial distribution.

(B) Attempt any four.

- (i) State the additive property of negative binomial distribution.
(ii) State the second form of p.m.f. negative binomial distribution.
(iii) State the memoryless property of geometric distribution.
(iv) What is the relation between geometric and negative binomial distribution?
(v) $X \sim Geo(0.45)$. Find the probability of $X < 3$?
(vi) State the distribution function of geometric distribution.
2. (A) (i) Derive the probability mass function of truncated (at $X = 0$) binomial distribution. Also find its mean.
(ii) Derive the probability mass function of truncated Poisson distribution at $X = 0$. Also find its variance.

OR

- (i) Derive the probability density function of truncated normal distribution truncated at both the ends. Also find its mean.
(ii) Derive the probability density function of left truncated normal distribution. Also find its mean.

(B) Attempt any four.

- (i) What do you mean by truncation?
(ii) Define right truncated distribution.
(iii) State the pmf of truncated (at $X = 0$) Poisson distribution.
(iv) State the mean of truncated Poisson distribution (at $X = 0$).
(v) Define left truncated distribution.
(vi) Define truncated distribution at both the ends.
3. (A) (i) Define Power Series Distribution. Obtain the recurrence relation for central moments of Power Series Distribution.

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- (ii) Show that binomial distribution is a particular case of Power Series Distribution. Obtain m.g.f. of binomial using PSD. Hence obtain its mean and variance.

OR

- (i) Obtain the recurrence relation for cumulants of Power Series Distribution.
(ii) Show that Logarithmic series distribution is a particular case of Power Series Distribution. Obtain its mean and variance.

(B) Attempt any **three**.

- (i) State the m.g.f. of power series distribution.
(ii) State the mean of Power Series Distribution.
(iii) State $f(\theta)$ for Poisson distribution as PSD.
(iv) State $f(\theta)$ for Geometric distribution as PSD.
(v) State $f(\theta)$ for Negative binomial distribution as PSD.

4. (A) (i) Obtain the probability density function of smallest order statistic.
(ii) Obtain the probability density function of smallest order statistic.

OR

- (i) Let X_1, X_2, \dots, X_n be a random sample of size n from the distribution $f(x)$ with distribution function $F(x)$. Obtain the distribution of range.
(ii) Let $X \sim U(a, b)$ and X_1, X_2, \dots, X_n be a random sample of size n from the distribution of X . Obtain the distribution of largest order statistic and also the distribution of range.

(B) Attempt any **three**.

- (i) Define Order Statistics.
(ii) State the joint probability density function of 1^{st} and n^{th} order statistics.
(iii) State the pdf of smallest order statistic.
(iv) State the joint distribution of order statistics.
(v) Give applications of order statistics.

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Electronics

March 2019

[Max. Marks : 70]

Time : 2-30 Hours]

- Q.1(a) (i) Explain the working of emitter coupled differential amplifier. Derive the equation for differential mode gain, common mode gain and CMRR. (07)
- (ii) Discuss the transverse characteristic of an emitter coupled differential amplifier. (07)
- OR
- (i) Explain the method to improving CMRR of the differential amplifier by using a constant current source. (07)
- (ii) Explain about current mirror load. (07)
- (b) Answer the following in brief (Any Four): (04)
1. Draw the block diagram of an OPAMP.
 2. Draw the pin-out diagram of IC 741.
 3. What is active load?
 4. What the function of Level shifter circuit?
 5. What is mean balance differential amplifier?
 6. What causes the off-set voltage at the input of an OPAMP.
- Q.2(a) (i) Draw the circuit of adder-subtractor using OPAMP. Explain the working of the circuit and derive the equation for its output voltage. (07)
- (ii) Explain the use of OPAMP as an ac amplifier. (07)
- OR
- (i) Draw the diagram of Instrumentation amplifier circuit using OPAMP and explain its working. (07)
- (ii) Draw the full-wave rectifier circuit using OPAMP and explain the working of the circuit. (07)
- (b) Answer the following in brief (Any Four): (04)
1. Draw the circuit of sign changer using OPAMP.
 2. Draw the circuit of unit gain buffer using OPAMP.
 3. What is the instrumentation amplifier?
 4. Draw the circuit of 3-input adder circuit using OPAMP.
 5. What is the advantage of OPAMP rectifier over diode rectifier?
 6. Draw the circuit of a half wave rectifier using OPAMP.
- Q.3(a) (i) Discuss the protection techniques used in IC regulators. (07)
- (ii) Draw the block diagram of 3-terminal fixed IC voltage regulators and explain its working. (07)
- OR
- (i) Draw the circuit diagram of 3-terminal adjustable regulator using IC 317. Explain its working and about load and line regulation factor of the circuit. (07)
- (ii) Discuss the function block diagram of voltage regulator IC-723. Explain the use of IC 723 as low voltage regulator. (07)

(b) Answer the following in brief (Any Three):

(03)

1. What is mean by current limit in case of regulator?
2. What is mean by negative voltage regulator?
3. What should be output voltage of IC 7912?
4. What is tracking regulator?
5. What is current regulator?

Q.4(a) (i) Explain the different techniques to design a switching voltage regulator circuit. (07)

(ii) Draw the circuit diagram of a buck type switching regulator. Show that for this circuit output voltage is proportional to duty cycle of switching frequency. (07)

OR

(i) Derive the equation of ripple factor for a buck type switching regulator (07)

(ii) Discuss the use of IC LM-105 as switching regulator. (07)

(b) Answer the following in brief (Any Three):

(03)

1. Give the full form of SMPS.
2. What is advantage of switching regulator?
3. What is mean by buck regulator?
4. What is mean by boost type regulator?
5. What is ESR?

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Botany

March 2019

Time : 2-30 Hours]

[Max. Marks : 70

- પ્ર.1 (અ): કારામા લીંગી પ્રજનનનો સચિત્ર અહેવાલ આપો. 14
અથવા
- પ્ર.1 (અ): વર્ણો: (i) પોલિસાઇફીનીયા માં ફલન પછીના ફેરફારો 07
(ii) કોલિયોકીટીની સુકાય રચના 07
- પ્ર.1 (બ): ટૂંકમા જવાબ આપો (કોઇપણ ચાર) 04
- (i) લીલના કોઇપણ બે ઔદ્યોગિક ઉપયોગો લખો.
(ii) ફૂટ દ્વિશાખા દર્શાવતી લીલનું નામ આપો.
(iii) સરગાસમ મા વાતકોથળી (એર બ્લેડર) નું કાર્ય અને સ્થાન.
(iv) પ્રદુષક નિર્દેશક લીલનું નામ આપો.
(v) રિવ્યુલારીયાને કયાં વર્ગમા વર્ગીકૃત કરવામા આવે છે?
(vi) પોલિસાઇફીનીયામા જોવા મળતા ખોરાક સંગ્રહી પદાર્થનું નામ આપો.
- પ્ર.2 (અ): કેટલીક અગત્યની ખાધ મશરૂમના નામ અને તેના ઉછેર માટેનો સંક્ષિપ્ત અહેવાલ આપો. 14
અથવા
- પ્ર.2 (અ): વર્ણો: (i) ફાયટોપ્થોરામા લીંગી પ્રજનન 07
(ii) પેઝાઇજા-એપોથિસિયમ ની રચના 07
- પ્ર.2 (બ): ટૂંકમા જવાબ આપો (કોઇપણ ચાર) 04
- (i) લુઝ સ્મટ અને ક્વર્ડ સ્મટ વચ્ચે શું તફાવત છે?
(ii) "કપ કુગ" તરીકે કઇ કુગ ઓળખાય છે?
(iii) માયકોપ્લાસ્મા ની શોધ કોણે કરી?
(iv) ફાયટોપ્થોરા ઇન્ફેસ્ટાંસ દ્વારા કયો રોગ થાય છે?
(v) એસ્પેરજીલસ માટે વૈકલ્પિક નામ આપો.
(vi) એક એસ્કસની અંદર કેટલાં એસ્કોસ્પોર ઉદ્ભવે છે?
- પ્ર.3 (અ): પોલિટ્રિકમ અને ફ્યુનારીયાના પ્રાવરનો તુલનાત્મક અહેવાલ આપો. 14
અથવા
- પ્ર.3 (અ): વર્ણો: (i) સ્ફેગ્નમ-પ્રજનન અંગો 07
(ii) દ્વિઅંગી વનસ્પતિના સ્થળજ વનસ્પતિ તરીકેના અનુકુલનો 07
- પ્ર.3 (બ): ટૂંકમા જવાબ આપો (કોઇપણ ત્રણ) 03
- (i) ભારતમા જોવા મળતી પેલિયાની બે જાતિના નામ આપો.
(ii) નોટોથાયલસ ના પ્રાવરમાં સ્થમ્બીકા (કોલ્યુમેલા) નું કાર્ય શું છે?
(iii) સુતિકા અને ફૂટસુતિકા વચ્ચેનો કોઇપણ એક તફાવત લખો.
(iv) પોલિટ્રિકમનો સમાવેશ જે વર્ગમા થાય છે તેનું નામ આપો.
(v) લિવરવર્ટ અને મોસના મુલાંગો મા તફાવત શું છે?

પ્ર.4 (અ): મધ્યરંભ એટલે શું? ત્રિઅંગી વનસ્પતિમાં મધ્યરંભીય ઉત્ક્રાંતિ વર્ણવો.

14

અથવા

પ્ર.4 (અ): વર્ણવો: (i) ઇક્વિસીટમ પ્રકાંડનો અનુપ્રસ્થ છેદ

07

(ii) સાયલોટમ-પુર્વદેહ

07

પ્ર.4 (બ): ટૂંકમાં જવાબ આપો (કોઇપણ ત્રણ)

03

- (i) સાયલોટમની બે જાતિના નામ આપો.
- (ii) ઇક્વિસીટમના શૂષ્કોદભિદ વનસ્પતિ તરીકેના બે લક્ષણો જણાવો.
- (iii) સાયલોટમ મા બીજાણુ ઉત્પાદન કરતા અંગને શું નામ આપવામા આવે છે?
- (iv) સાયલોટમ પ્રકાંડમાં કયા પ્રકારનો મધ્યરંભ તમે જોયો છે?
- (v) ઇક્વિસીટમ બીજાણુની ફક્ત નામનિર્દેશીત આકૃતિ દોરો.

- Que.1 (A): Give an illustrated account of the sexual reproduction in *Chara*. 14
OR
- Que.1 (A): Describe: (i) Post fertilization changes in *Polysiphonia* 07
(ii) Thallus structure of *Coleochaete* 07
- Que.1 (B): Answer in short (Any four) 04
- (i) Write any two industrial uses of algae.
 - (ii) Name the alga which show false dichotomy.
 - (iii) Function and location of air bladder in *Sargassum*.
 - (iv) Name an alga which is pollution indicator.
 - (v) *Rivularia* is classified in which class?
 - (vi) Name the reserve food material found in *Polysiphonia*.
- Que.2 (A): Name some important edible mushrooms and give a brief account of their cultivation. 14
OR
- Que.2 (A): Describe: (i) Sexual reproduction in *Phytophthora* 07
(ii) Structure of *Peziza*-apothecium 07
- Que.2 (B): Answer in short (Any four) 04
- (i) What is the difference between loose smut and covered smut?
 - (ii) Which fungus is known as cup fungi?
 - (iii) Who has discovered Mycoplasma?
 - (iv) Name the disease caused by *Phytophthora infestans*.
 - (v) Give alternative name for *Aspergillus*.
 - (vi) How many ascospore develops in single ascus?
- Que.3 (A): Give a comparative account of capsule of *Polytrichum* and *Funaria*. 14
OR
- Que.3 (A): Describe: (i) *Sphagnum*-Sex organs 07
(ii) Adaptation of Bryophytes as land plant 07
- Que.3 (B): Answer in short (Any three) 03
- (i) Name two species of *Pellia* found in India.
 - (ii) What is the function of columella in capsule of *Notothylas*?
 - (iii) Write any one difference between elater and psuedoelater?
 - (iv) Name the class to which *Polytrichum* belongs.
 - (v) What is the difference in the rhizoids of liverworts and moss?
- Que.4 (A): What is stele? Describe steler evolution in Pteridophytes. 14
OR
- Que.4 (A): Describe: (i) T. S. of *Equisetum* stem 07
(ii) *Psilotum*-Prothallus 07
- Que.4 (B): Answer in short (Any three) 03
- (i) Name two species of *Psilotum*.
 - (ii) Mention two xerophytic features of *Equisetum*.
 - (iii) What is the name given to the spore producing organ of *Psilotum*?
 - (iv) Which type of stele do you observe in stem of *Psilotum*?
 - (v) Draw only labelled diagram of *Equisetum* spore.

T. Y. B.Sc. (Sem.-5) Examination

301

Ecology, Animal Diversity

March 2019

Time : 2-30 Hours]

[Max. Marks : 70

- સૂચના : (૧) બધા જ પ્રશ્નો ફરજિયાત છે.
(૨) જમણી બાજુના અંક ગુણ દર્શાવે છે.

- ૧ (અ) (૧) સમજાવો : જૈવિક સમાજમાં સમયસામયિકતા. ૭
(૨) સમજાવો : જલકમક અનુક્રમણ. ૭
- અથવા
- (૧) સ્થલજ નિવાસ્થાનની કોમ્યુનીટીમાં સ્તરીકરણ વર્ણવો. ૭
(૨) પરિસ્થિતિકીય અનુક્રમણનું મહત્વ યોગ્ય ઉદાહરણો સહિત વર્ણવો. ૭
- (બ) ટૂંકમાં લખો (કોઈપણ ચાર) : ૪
(૧) પીરિઓરિસીટીની વ્યાખ્યા આપો.
(૨) પરિસ્થિતિવિધાની વ્યાખ્યા આપો.
(૩) શબ્દ સમજાવો : વિષમપોષિ અનુક્રમણ.
(૪) ચરમ વનઅવસ્થા એટલે શું?
(૫) જેરોસીયર (મુટસંચક)ના ભાગોના નામ આપો.
(૬) વ્યાખ્યા આપો : વસાહત.
- ૨ (અ) (૧) વર્ણવો : માંદા વિંછીનું પ્રજનનતંત્ર ૭
(૨) વર્ણવો : વાદળીમાં કંકાલતંત્ર. ૭
- અથવા
- (૧) નોંધ લખો : વિંછીનું પાચનતંત્ર ૭
(૨) નોંધ લખો : બહુરૂપકતા. ૭
- (બ) ટૂંકમાં લખો (કોઈપણ ચાર) : ૪
(૧) પોકિટનનું સ્થાન અને કાર્ય જણાવો.
(૨) વિંછીમાં જોવા મળતા વ્યસન અંગોના નામ લખો.
(૩) કયા પ્રકારના નલીકાતંત્રમાં (ફ્લેજલેટેડ ચેમ્બર) જોવા મળે છે?
(૪) કયા પ્રકારની ઉત્સર્ગીકા જાળોમાં જોવા મળે છે?
(૫) ટ્યુબનીવાસી બહુલોભી પ્રાણીઓના બે નામ આપો.
(૬) પેડીપાલપ (પદ્સ્પર્શકો)નું સ્થાન અને કાર્ય જણાવો.
- ૩ (અ) (૧) વર્ણવો : કટલફિશનું પાચનતંત્ર. ૭
(૨) વર્ણવો : મુદ્દુકાયમાં વલયન. ૭
- અથવા
- (૧) નોંધ લખો : નર સેપીયાનું પ્રજનનતંત્ર. ૭
(૨) નોંધ લખો : ઝૂઈઆ અને મંગાલોયા ડિમ્બ. ૭

0603N204-2

- (બ) ટૂંકમાં લખો (કોઈપણ ત્રણ) : ૩
- (૧) સેપીઆનું વર્ગીકરણ આપો.
- (૨) વ્યાખ્યા આપો : શીર્ષ હસ્ત (સીકેલીક આર્મ) (મુખ્ય હસ્ત)
- (૩) વ્યાખ્યા આપો : ડેકાપોડા ઉદાહરણ સહિત.
- (૪) સેપીયાના રૂઢિચરંજકનું નામ જણાવો.
- (૫) અમ્બો (Ambo) કયા પ્રાણીના કવચમાં જોવા મળે છે?
- ૪ (અ) (૧) સમજાવો : સ્ટારફીશની શરીરદીવાલ. ૭
- (૨) સમજાવો : બ્રેકિયોવોડાના સામાન્ય લક્ષણો. ૭
- અથવા
- (૧) નોંધ લખો : સ્ટારફીશના પાંચન અંગો વિશે. ૭
- (૨) નોંધ લખો : ડોલીઓલારીઆ ડિમ્બ અને એકીનોપ્લુટિઅસ ડિમ્બ. ૭
- (બ) ટૂંકમાં લખો (કોઈપણ ત્રણ) : ૩
- (૧) શબ્દ સમજાવો : બાયનીયમ (Bivium).
- (૨) મેટ્રોપોરાઈટનું સ્થાન અને કાર્ય જણાવો.
- (૩) પ્રીઓરલલુપ કયા ડિમ્બમાં જોવા મળે છે?
- (૪) વ્યાખ્યા આપો : લોપોફોર.
- (૫) એક્યુરોઈડિયાનું ઉદાહરણ આપો.

ENGLISH VERSION

Instruction : Figures to right indicates full marks.

- 1 (a) (i) Explain : community periodicity. 7
- (ii) Explain : Hydroseve succession. 7
- OR
- (a) (i) Describe community stratification in terrestrial habitat. 7
- (ii) Describe significance of ecological succession giving suitable examples. 7
- (b) Write in short (any four) : 4
- (i) Define : periodicity
- (ii) Define : ecology.
- (iii) Explain term : Heterotrophic succession.
- (iv) What is climax forest?
- (v) Name Various stages of X eroseve.
- (vi) Define : community.

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- 2 (a) (i) Describe female reproductive system of scorpion. 7
(ii) Describe skeleton in sponges. 7
- OR**
- (a) (i) Write note on digestive system of scorpion. 7
(ii) Write note on polymorphism. 7
- (b) Write in short (any four) : 4
(i) State the location and function of dactine.
(ii) Write the name of respiratory organs in scorpion
(iii) Flagellated chambers are found in which type of canal system?
(iv) Which type of nephridia present in hirudinea?
(v) Give two name of Tubicolous polychaetes animal.
(vi) Write the location and function of pedipalp.
- 3 (a) (i) Describe digestive system of cuttle fish. 7
(ii) Describe Torsion in Mollus ca. 7
- OR**
- (a) (i) Write a note on male reproductive system in Sepia. 7
(ii) Write a note on Zoaea and Megalopa Larva. 7
- (b) Write in short (any three) : 3
(i) Give classification of Sepia.
(ii) Define : cephalic arm.
(iii) Define : Decapoda with example.
(iv) Name blood pigments of Sepia.
(v) Umbo are found in which animal shall.
- 4 (a) (i) Explain : Body wall of Starfish. 7
(ii) Explain : General characters of Brachiopoda. 7
- OR**
- (a) (i) Write a note on : Digestive organs of Starfish. 7
(ii) Write a note on : Doliolaria Larva and Echinopleuteus Larva. 7
- (b) Write in short (any three) : 3
(i) Explain the term? Bivium.
(ii) State the location and function of madreporite.
(iii) Preoral loop found in which larva?
(iv) Define : Lophophore.
(v) Give example of Echinoid.
-

B.Sc. (Sem.-5) Examination

CC 301

Biotechnology

March 2019

Time : 2-30 Hours]

[Max. Marks : 70

- Q1(A) Discuss the applications of Genome Mapping and draw genetic map of Lambda Phage (14)
OR
- (A)1 Discuss the salient findings of Human Genome Project. (07)
(A)2 Discuss the salient features of *Saccharomyces cerevisiae* genome. (07)
- (B) Answer the following in brief (any 4) (04)
- 1 Define: Physical Map
 - 2 Why *Arabidopsis thaliana* genome is used as a model for studying plant biology?
 - 3 Give two reasons explaining need for model organisms.
 - 4 List any two salient features of E. coli genome.
 - 5 Name any two Physical mapping methods.
 - 6 Write possible order of the genes in a linkage map, if map distance between genes A and B is 3, B and C is 10 and C and A is 7 units.
- Q2(A) Discuss Sanger's Dideoxy method for DNA sequencing with diagram (14)
OR
- (A)1 Discuss in detail Peptide mass spectrum with MALDI-ToF. (07)
(A)2 Write a note on DNA foot printing. (07)
- (B) Answer the following in brief (Any 4) (04)
- 1 Define: RFLP
 - 2 What is DNA shot gun technique?
 - 3 Name one each software and the Database used for submitting DNA Sequences.
 - 4 Molecular marker amplified by PCR and is polymorphic by length is called?
 - 5 Define: PCR
 - 6 What is cDNA cloning?
- Q3(A) Write a note on recombinant DNA technology and its applications. (14)
OR
- (A)1 Write a note on Restriction Endonucleases illustrating with appropriate examples. (07)
(A)2 Discuss the role of λ phage as cloning vector. (07)
- (B) Answer the following in brief (Any 3) (03)
- 1 Define: Phagemids
 - 2 What are Shuttle vectors?
 - 3 Define: Gene library
 - 4 What are Artificial chromosomes?
 - 5 What is Chiasmata?

- Q4(A) Discuss gene regulation in Lambda phage for establishment and maintenance of lysogeny (14)
OR
- (A)1 Discuss the role of Chromatin and DNA methylation in eukaryotic gene regulation. (07)
(A)2 Discuss Quorum Sensing with a suitable example. (07)
- (B) Answer the following in brief (Any 3) (03)
- 1 Define: repressors and activators
 - 2 Define: Operon
 - 3 What is the role of dorsal proteins?
 - 4 What are Ribozymes Switches?
 - 5 How mRNA differs in sequence from tRNA and rRNA?

B.Sc. (Sem.-5) Examination

CC 301

Health & Hygiene

March 2019

Time : 2-30 Hours]

[Max. Marks : 70

Q-1 A) Write a detailed note on various operating systems for personal computer (14)

OR

A) 1) Describe the Internet and its effective uses in health sector (7)

2) Describe input-output devices of computer with suitable examples. (7)

B) Attempt any Four. (4)

1) What is merge printing in MS Word?

2) Which MS Office module is useful for making graphs?

3) List any Two types of computer Network

4) Who discovered Linux OS?

5) Name two companies making computer microchips for Personal Computer.

6) Name database module in MS Office

Q-2 A) Write a detailed note on central tendencies and its measurement. (14)

OR

A) 1) Describe Standard deviation and Variance with suitable examples (7)

2) Explain types of Graphs and its purpose to represent the data (7)

B) Attempt any Four. (4)

1) What is meaning of Frequency in data sample?

2) Define p-value

3) Find the median of the set = {12, 24, 43, 56, 65, 95}

4) Define Probability giving its formula

5) What is Type-I error?

6) Define Variance and write its formula.

Q-3 A) Explain two methods for sequencing of gene showing its merits and demerits (14)

OR

A) 1) Enlist the modern approach for designing drugs with suitable example (7)

2) Write a note on GPS Technology and its applications in health and medicine. (7)

B) Attempt any three. (3)

1) What is remote sensing?

2) Give full name of BLAST

3) What is use of image analysis software in laboratory?

4) What is data mining?

5) What is sequence alignment?

Q-4 A) Write a detailed note on use of computer and networking health care sector. (14)

OR

A) 1) What is medical transcription? Explain nature of its data, processing and applications parts (7)

2) Describe the concept and principle of robotic and distant surgeries. (7)

B) Attempt any three. (3)

1) Define telemedicines.

2) What is PASW?

3) Name any one commercial medical software.

4) What is purpose of analyzing data on occurrence of particular disease?

5) Name two tabs available for viewing in SPSS

B.Sc. (Sem.-5) Examination

CC 302

Environmental Science

March 2019

Time : 2-30 Hours]

[Max. Marks : 70

- Q-1 (A) Explain metabolic diversity of phototrophic microorganisms in detail. 14
OR
- (A) 1. Narrate role of microorganisms in Nitrogen Cycle. 07
2. Describe Molecular approaches used in microbial ecology. 07
- (B) Answer any four. 04
1. Enlist molecular methods used in studying microbial ecology.
 2. Define mutualism type of microbial interactions
 3. Give example of two diseases transmitted airborne.
 4. What is phylogenetic diversity of microorganisms?
 5. Giardiasis caused by the flagellated protozoan is transmitted through water
 6. Name two characteristics of the ideal microbial indicator used to check water pollution.
- Q-2 (A) Describe waste water treatment methods in detail. 14
OR
- (A) 1. Explain drinking water purification techniques. 07
2. What is chelation? Write in detail use of chelators and scrubbers. 07
- (B) Answer any four. 04
1. Name the bacteria serious nuisance in water supplies transforming soluble iron compounds into insoluble ferric hydroxide.
 2. Give upstream flow diagram of waste water flow in Municipal water purification plant.
 3. Write principle of electrostatic precipitator for air
 4. Define the term Activated Sludge
 5. is the most satisfactory method for disposing of sewage from small installation.
 6. Hard water is treated with lime and/or Soda ash to precipitate by common ion effect.
- Q-3 (A) Explain Microbial degradation of Xenobiotic compounds 14
OR
- (A) 1. Explain Control of Pest and disease by microorganisms. 07
2. Write short note on Eutrophication. 07
- (B) Answer any Three. 03
1. Define the term Biomagnification.
 2. bacteria is potent oil spill degrading microorganisms.
 3. What is Lagoon?
 4. Define the term Sub-surface Infiltration.
 5. Name two bacteria used to control insect pest
- Q-4 (A) Explain role of Genetic Engineering & r-DNA technology in Microbial biodegradation. 14
OR
- (A) 1. What is Polymerase Chain Reaction? Explain its types & application. 07
2. Describe Molecular hybridization technique 07
- (B) Answer any Three. 03
1. What is the role of Primer in PCR?
 2. Give the name of any one blotting technique and its use.
 3. Gene Expression is regulated at and levels.
 4. Non coding 'Introns' in the DNA fragments are removed with the help of enzyme
 5. How type of nitrogen bases in double stranded DNA affects Tm value?

B.Sc. (Sem.-5) Examination

CC 302

Bio-Chemistry

March 2019

Time : 2-30 Hours]

[Max. Marks : 70

Q1(A) 1 Discuss the experiment of Hershey & Chase. (14)
 2 Explain experiment of Griffith.
 State the importance of these experiments in molecular biology?

OR

Q1(B)1 What is the role of DNA pol I and DNA pol III in replication? (07)

Q1(B)2 Discuss: Rolling circle model of DNA replication. (07)

Q1(c) Answer the followings(Any four) (04)

1. Define: Hyperchromicity. 2. What is Tm. 3. What is DNA super coiling?
4. List various forms of DNA. 5. Define: Replication. 6. What is SSb

Q2(A)1 Discuss the post transcriptional modifications (14)

OR

Q2(B)1 Discuss : 5BU & Nitrous acid as mutagenic agents (07)

Q2(B)2 State seven characteristics of Genetic Code. (07)

Q2(c) Answer the followings(Any four) (04)

1. List the termination codon. 2. What is Mutation? 3. What is promoter?
4. Draw and label transcription bubble, 5. Name the scientists who deciphered the genetic codes. 6. Who gave Wobbel's hypothesis

Q3(A) What is Translation? Explain elongation step of this process (14)

OR

Q3(B)1 Explain regulation of gene expression with a suitable example. (07)

Q3(B)2 Write a note on post Translational modifications (07)

Q3(c) Answer the followings(Any Three) (03)

1. Define: Hyperchromicity 2. Name two inhibitors of translation. 3. What is an inducer. 4. Define an operon 5. Who gave Lacoperon model. (03)

Q4(A) Discuss in detail the steps used in isolation & estimation of Genomic DNA (14)

OR

Q4(B)1 Write a note on followings:

Q4(B)2 1) Restriction endonucleases. (07)

2) Applications of Genetic engineering (07)

Q4(c) Answer the followings(Any Three) (03)

1 Southern blotting & Western blotting techniques are used for which biomolecules?

2 Name the tracker dye & detecting dye used in agarose gel electrophoresis of DNA

3. Name a plasmid vector used in genetic engineering

4. State two applications of genetic engineering

5 List two biohazards of genetic engineering

B.Sc. (Sem.-5) Examination

CC 302

Statistics

March 2019

[Max. Marks : 70]

Time : 2-30 Hours]

- Q1. (a) (i). Give difference between statistics and estimator. Explain general procedure of estimation. (7)
- (ii). Describe the problem of interval estimation. (7)

Or

- (a). (i). Obtain $100(1-\alpha)\%$ confidence interval for the parameter μ of Normal distribution when population variance is known. (7)

- (ii) Obtain $100(1-\alpha)\%$ Confidence interval for s^2 of the Normal Distribution. (7)

(b). Answer any Four.

- (1). The purpose of statistical inference is to provide information about the (4)

- sample based upon information contained in the population
- population based upon information contained in the sample
- population based upon information contained in the population
- mean of the sample based upon the mean of the population

- (2). The following data was collected from a simple random sample of a population.

13 15 14 16 12

The point estimate of the population mean

- cannot be determined, since the population size is unknown
- is 14
- is 4
- is 5

- (3). Define estimable.

- (4). Define parameter

- (5). What is the difference between point estimator and interval estimate?

- (6). Explain the meaning of 95% confidence interval.

- Q. 2 (a): (i) Stating regularity conditions state and prove Cramer-Rao inequality. (7)

- (ii). show that $\bar{X} = \frac{\sum_{i=1}^n X_i}{n}$, in random sampling from (7)

$$f(x, \theta) = \begin{cases} \frac{1}{\theta} \exp\left(-\frac{x}{\theta}\right), & 0 < x < \infty \\ 0, & \text{Otherwise} \end{cases}, \text{ where } 0 < \theta < \infty$$

\bar{X} is an MVB estimator of θ and has variance $\frac{\theta^2}{n}$.

Or

- (a). (i). A random sample x_1, x_2, \dots, x_n is taken from uniform distribution with parameter θ , where $0 < x < \theta$. (7)

Obtain consistent estimator for θ .

- (ii) State and prove factorization theorem for discrete case only. (7)

(b). Attempt Any Four.

- (1). Give condition for Cramer Rao inequality to become equality. (4)

N217-2

- (2). Define unbiasedness.
- (3). When can you say an estimator is efficient?
- (4). Define consistent estimator.
- (5). When can you say that an estimator is sufficient?
- (6). Define MVBE.

Q. 3 (a) (i) Explain Method of Moments.

(ii) Estimate θ by the method of moments for the following distribution.

$$f(x, \theta) = \theta x^{(\theta-1)}; 0 \leq x \leq 1 \\ = 0; \text{Otherwise}$$

Or

(a). (i). Find the maximum likelihood estimate for the parameter λ of a poisson distribution on the basis of a sample of size n . Also find its variance.

(ii). Obtain mle of μ in normal distribution with parameters μ and σ^2 where σ^2 is known.

(b). Attempt any Three.

(1). What remedy you suggest when mle fails?

(2). What do you mean by non regular distribution?

(3). If there are two population parameters, How many sample moments are required to follow method moments?

(4). Give two properties of mle.

(5). State Rao-Blackwell theorem.

Q. 4 (a). (i) Explain ANOVA with respect to one way classification in detail.

(ii). Describe three principles of experimental design.

Or

(a) (i). Give complete layout of two way classification.

(ii). Give complete lay out of CRD.

(b). Attempt Any Three.

(1). Define treatments in design of experiment.

(2). Give formulae of critical difference in ANOVA.

(3). Name the distribution you used in ANOVA.

(4). What is null and alternative hypothesis in one way ANOVA?

(5). Give two assumptions of ANOVA.

— X —

B.Sc. (Sem.-5) Examination

302

Electronics

March 2019

Time : 2-30 Hours]

[Max. Marks : 70

Instruction : Figures to right indicates full marks.

1 (a) Write the following :

- (i) Explain about $2 \times \text{mod } 5, \text{ mod } 10$ counter. 7
 (ii) Explain about $2 \times \text{mod } 3, \text{ mod } 6$ counter. 7

OR

- (i) Write note on decoding gates. 7
 (ii) Explain about Moore model & Melay model. 7

(b) Solve (any four) : 4

- (i) How many flip flops are required to construct mod 2048 counter?
 (ii) Give disadvantages of asynchrences counter.
 (iii) What is decade counter?
 (iv) Define ripple counter
 (v) IC 74163 is a counter
 (vi) Define Glitch.

2 Write the following :

- (a) (i) Draw a signal diagram of IC 8085 & explain all groups in detail. 7
 (ii) Write note on "Generating control signal". 7

OR

- (a) (i) Draw the timing diagram of memory read cycle & explain all T states. 7
 (ii) Draw the timing diagram of memory. Write cycle & explain all T states. 7

(b) Solve (any four) : 4

- (i) Program counter is a bit register.
 (ii) Stack pointer is a bit register.
 (iii) Give the full form of BCD.
 (iv) Give the full form of ALE.
 (v) How many flags exist in 8085?
 (vi) IC 8085 is a Pin IC.

[P.T.O.]

0703N218-2

3 Write the following :

- (a) (i) Write a program to perform the following instructions & verify the output : 7
(1) Load 8 C H in register B
(2) Load 6 D H in register D
(3) Increment the content of register D by one.
(4) Add the content of both the register & display the sum at O/P Port 2.
- (ii) Write a program to : 7
(1) Clear the accumulator
(2) add 57H (Use ADI instruction)
(3) Subtract 72 H
(4) Add 55 H
(5) Display the result after subtraction 72 H & after adding 55H.
(6) Specify the answer at the o/p port.

OR

- (a) (i) Draw the timing diagram of 'IN' instruction & explain all T states. 7
(ii) Draw the timing diagram of 'OUT' instruction & explain all T states. 7
- (b) Solve (any three) : 3
(i) The 8085 microprocessor uses a bit data bus.
(ii) The 8085 microprocessor uses a bit address bus.
(iii) JNC C020H is a byte instruction.
(iv) Memory map I/O requires bit address.
(v) Peripheral I/O requires bit address.

4 Write the following :

- (a) (i) Write a program to perform the following task : 7
A set of current reading is stored in memory location starting at D050 H. The end of data string is indicated by OOH. Add all the readings. The answer may be than FFH. Store the answer in memory location D070 H & D071 H
Data (H) 59, 38, 49, A2, 00
- (ii) Explain all the instruction used in above program. 7

OR

- (a) (i) Write a program to perform the following task : 7
A set of 3 reading is stored in memory location starting at D090H. Arrange them in ascending order
Data (H) 57, A2, 36.
- (ii) Explain all the instruction used in above program 7
- (b) Solve (any three) : 3
(i) Explain about the following instruction
(1) DCX C
(2) STAX B
(3) LDA 5020H
(4) LXI H C020H
(5) SUB B.

B.Sc. (Sem.-5) Examination

CC 302

Botany

Time : 2-30 Hours]

March 2019

[Max. Marks : 70

પ્રશ્ન-૧	(અ)	વર્ણવો. હર્બેરીયમ તકનીકી	૧૪
		અથવા	
પ્રશ્ન-૧	અ.	(૧) ટુંકનોંધ લખો. બેન્થામ અને હુકરની વર્ગીકરણ પદ્ધતિનાં ગુણ દોષો	૭
		(૨) ટુંકનોંધ લખો. ICBN નાં સિંધ્યાતો અને નિયમો	૭
પ્રશ્ન-૧	(બ)	ટૂંકમાં જવાબ આપો. (છ માંથી કોઇપણ ચાર)	૪
		(૧) એંગ્લર અને પ્રેન્ટલ દ્વારા પ્રકાશિત વિશ્વવિખ્યાત ગ્રંથનું નામ આપો.	
		(૨) હિનામી નામકરણ પદ્ધતિનો પ્રારંભ કયા વૈજ્ઞાનિકે કર્યો હતો?	
		(૩) વનસ્પતિ ઉદ્યાનનું મહત્વ જણાવો.	
		(૪) ભારતનાં પ્રખ્યાત હરબેરિયાનું નામ અને સ્થાન જણાવો.	
		(૫) પુર્વ એશીયાનો સૌથી મોટો બોટનીકલ ગાર્ડન કયાં આવેલો છે?	
		(૬) જાતિ ઉદ્વિકાસકીય વર્ગીકરણ પદ્ધતિ એટલે શું?	
પ્રશ્ન-૨	(અ)	કેપેરીડેસી અને બીગ્નોનીએસી કુળનાં, સામાન્ય લક્ષણો, પુષ્પસુત્ર અને પુષ્પાકૃતિ આપો. તે કુળમાંથી બે આર્થિક ઉપયોગી વનસ્પતિઓનાં વૈજ્ઞાનિક નામ તથા ઉપયોગો જણાવો.	૧૪
		અથવા	
પ્રશ્ન-૨	અ.	(૧) ટુંકનોંધ લખો. કેલોટ્રોપીસ પ્રજાતિનું કારણોસહિત વર્ગીકરણકરી યોગ્ય કુળમાં મુકો.	૭
		(૨) ટુંકનોંધ લખો. રહામનેસી કુળનાં સામાન્ય લક્ષણો	૭
પ્રશ્ન-૨	(બ)	ટૂંકમાં જવાબ આપો. (છ માંથી કોઇપણ ચાર)	૪
		(૧) ભુમિગત (ક્લિસ્ટોગેમસ) પુષ્પો કઈ વનસ્પતિમાં જોવા મળે છે?	
		(૨) બોરાજીનેસી કુળનું પુષ્પસુત્ર અને પુષ્પાકૃતિ આપો.	
		(૩) ચીનોપોડીએસી કુળનું વર્ગીકરણ આપો.	
		(૪) ગળો કયા કુળની વનસ્પતિ છે? તેનો ઉપયોગ જણાવો.	
		(૫) તૃષ નિપત્રની હાજરી કયા કુળમાં જોવા મળે છે?	
		(૬) ગુઆઝુમા ટોમેન્ટોઝા કયા કુળની વનસ્પતિ છે?	
પ્રશ્ન-૩	(અ)	વર્ણવો. ભુણપોષનાં પ્રકારો	૧૪
		અથવા	
પ્રશ્ન-૩	અ.	(૧) ટુંકનોંધ લખો. પરાગનલિકાનું અંકુરણ અને તે પર અસર કરતા પરિબળો	૭
		(૨) ટુંકનોંધ લખો. ફુસીફર પ્રકારનો ભુણવિકાસ.	૭

પ્રશ્ન-૩	(બ)	ટૂંકમાં જવાબ આપો. (પાંચ માંથી કોઈપણ ત્રણ)	૩
		(૧) સૌથી લાંબામાં લાંબો ભુણપોષીય ચુષક કઈ વનસ્પતિમાં જોવા મળે છે?	
		(૨) અસંયોગીજનન એટલે શું?	
		(૩) ભારતમાં આવેલા કોઈપણ બે પેલીનીલોજી(પરાગવિદ્યા) નાં સંશોધન કેન્દ્રોનાં નામ આપો.	
		(૪) ફલન પછી અંડકનું શેમાં રૂપાંતર થાય છે?	
		(૫) પરાગરજની દિવાલમાં "બેક્યુલા" શું છે?	
પ્રશ્ન-૪	(અ)	વર્ણવો. યાંત્રિક પેશીતંત્ર અને તેનાં પ્રકારો	૧૪
		અથવા	
પ્રશ્ન-૪	અ.	(૧) ટુંકનોંધ લખો. મૂળ-પ્રકાંડ સંક્રાંતિનાં કોઈપણ બે પ્રકારો.	૭
		(૨) ટુંકનોંધ લખો. શોષક પેશીતંત્ર	૭
પ્રશ્ન-૪	(બ)	ટૂંકમાં જવાબ આપો. (પાંચમાંથી કોઈપણ ત્રણ)	૩
		(૧) અપચ્છેદન સ્તર એટલે શું?	
		(૨) પાર્શ્વીય મુળનું કાર્ય જણાવો?	
		(૩) પાચક ગ્રંથી ધરાવતી કોઈ પણ બે વનસ્પતિનાં ઉદાહરણ આપો.	
		(૪) રાજનલિકા એટલે શું?	
		(૫) દ્રઢોત્તકપેશી નું કાર્ય શું છે?	

Time: 2.30 hours

Total Marks: 70

- Instructions: 1. All questions are compulsory.
2. Illustrate your answers with neat and labeled diagrams.

Question-1	(A)	Describe: Herbarium techniques	14
OR			
Question-1	A	(1) Write short notes: Merits and demerits of Bentham and Hooker's system of classification.	7
		(2) Write short notes: Principles and rules of ICBN	7
Question-1	(B)	Write brief answers: (Any four out of Six)	4
		(1) Give the name of world famous book published by Engler and Prantl.	
		(2) Which scientist started Binomial nomenclature system?	
		(3) Mention the Importance of Botanical garden	
		(4) Give the name of any two famous Herbaria in India.	
		(5) Which one is the Best Botanical garden in East Asia?	
		(6) What is Phylogenetic Classification system?	
Question-2	(A)	Describe: Give the general characters, floral formula and floral diagram of <i>Capparidaceae</i> and <i>Bignoniaceae</i> families. Give the scientific names and uses of any two economically important plants from these families.	14
OR			
Question-2	A	(1) Write short notes: Give the classification with reason of <i>Calotropis</i> Genus and put in proper Family.	7
		(2) Write short notes: General characters of <i>Rhamnaceae</i> Family	7
Question-2	(B)	Write brief answers: (Any four out of Six)	4
		(1) In which Plant possess Clistogamous flowers?	
		(2) Give the floral formula and floral diagram of Boraginaceae Family.	
		(3) Give the classification of Chenopodiaceae family.	
		(4) Galo (<i>Tinospora</i>) belong to which plant? Give its uses.	
		(5) Glumes seen in which Family?	
		(6) <i>Guazuma tomentosa</i> belong to which Family?	
Question-3	(A)	Describe: Types of Endosperm	14
OR			
Question-3	A	(1) Write short notes: The germination of pollen grain and factors affecting it.	7
		(2) Write short notes: Crucifer type of embryo development.	7

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- Question-3 (B) Write brief answers: (Any Three out of Five) 3
- (1) In Which plant possess the longest Endospermic haustoria ?
 - (2) Define. Apomixis.
 - (3) Name any two Palynological research centre in India.
 - (4) What is the modification of ovule after fertilization?
 - (5) What is "Bacula" in Pollen wall?
- Question-4 (A) Describe: Mechanical Tissue and its types. 14
- OR
- Question-4 A (1) Write short notes: Any two types of root-stem transition. 7
- (2) Write short notes: Absorption tissue. 7
- Question-4 (B) Write brief answers: (Any Three out of Five) 3
- (1) Define. Abscission layer.
 - (2) What is the function of lateral roots?.
 - (3) Give any two example of plants in which Digestive glands are present?
 - (4) Define Rasin duct.
 - (5) What is the function of Sclerenchymatous tissue?
-

T. Y. B.Sc. (Sem.-5) Examination

302 - Zoology

Animal Diversity (Chordates)

March 2019

Time : 2-30 Hours]

[Max. Marks : 70

સૂચના : (૧) બધા જ પ્રશ્નો ફરજિયાત છે.

(૨) જમણી બાજુના અંક ગુણ દર્શાવે છે.

- ૧ (અ) (૧) લેબીઓનું મગજ વર્ણવો. ૭
 (૨) લેબીઓના હૃદયની અંતસ્થ રચના વર્ણવો. ૭
 અથવા
 (૧) લેબીઓનું પાચનતંત્ર વર્ણવો. ૭
 (૨) લેબીઓનું નર મૂત્રજનન તંત્ર વર્ણવો. ૭
 (બ) ટૂંકમાં જવાબ આપો (કોઈપણ ચાર) : ૪
 (૧) લેબીઓનું નિવાસસ્થાન લખો.
 (૨) લેબીઓમાં પૂચ્છમીનપક્ષનો પ્રકાર જણાવો.
 (૩) લેબીઓમાં કયા પ્રકારની ઝાલરો જોવા મળે છે.
 (૪) લેબીઓનો ખોરાક જણાવો.
 (૫) લેબીઓમાં કયા પ્રકારના ભભીંગડા જોવા મળે છે?
 (૬) લેબીઓમાં આંતરડું શા માટે લાંબુ હોય છે?
- ૨ (અ) (૧) કબૂતરમાં વાતકોથળી વર્ણવો. ૭
 (૨) કબૂતરના મગજનો પૃષ્ઠ દેખાવ વર્ણવો. ૭
 અથવા
 (૧) કબૂતરમાં પીંછાના પ્રકારો વર્ણવો. ૭
 (૨) કબૂતરનું માદા મૂત્રજનનતંત્ર વર્ણવો. ૭
 (બ) ટૂંકમાં જવાબ આપો (કોઈપણ ચાર) : ૪
 (૧) કબૂતરનું વર્ગીકરણ લખો.
 (૨) કબૂતરની અવસારણીના ભાગોના નામ લખો.
 (૩) દ્વિદલ વાલ્વનું સ્થાન લખો.
 (૪) અગોત્રિક ધમનીનું મહત્ત્વ લખો.
 (૫) યાકૃત શિરાનું મહત્ત્વ લખો.
 (૬) કબૂતરમાં કયા પ્રકારના મૂત્રપિંડ જોવા મળે છે?
- ૩ (અ) (૧) નીઓટેનીને અસરકર્તા પરિબળો સમજાવો. ૭
 (૨) મત્સ્યોમાં સ્થાનાંતરણ સમજાવો. ૭
 અથવા
 (૧) કાસ્થિમત્સ્ય અને અસ્થિમત્સ્ય વચ્ચેનો તફાવત સમજાવો. ૭
 (૨) ઉભયજીવીમાં પૈતૃકપાલન વર્ણવો (ત્રણ ઉદાહરણ આપો). ૭

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- (બ) ટૂંકમાં જવાબ આપો (કોઈપણ ત્રણ) : 3
- (૧) રેડ ગેસ ગ્રંથી (red gas gland) નું મહત્ત્વ લખો.
- (૨) વ્યાખ્યા આપો : પૈતૃક પાલન
- (૩) શબ્દ સમજાવો : નીઓટેની
- (૪) વ્યાખ્યા : સ્થાનાંતરણ
- (૫) શબ્દ સમજાવો : ડીપ્નોઈ.
- ૪ (અ) (૧) સમજાવો : પક્ષીઓ ઉત્કૃષ્ટ સરીસૃપ. 9
- (૨) વર્ણવો : ડાયમેટ્રોડ્રોન અને પ્ટેરોનોડોન 9
- અથવા
- (૧) જલીય સસ્તનોના અનુકૂલન વર્ણવો. 9
- (૨) મત્સ્ય અને સસ્તનની ધમનીકમાનોનો તુલનાત્મક અહેવાલ આપો. 9
- (બ) ટૂંકમાં જવાબ આપો (કોઈપણ ત્રણ) : 3
- (૧) શબ્દ સમજાવો : ડાયનોસોર
- (૨) વ્યાખ્યા : અનુકૂલન
- (૩) વ્યાખ્યા : દંતવિન્યાસ
- (૪) શબ્દ સમજાવો : લોફોડોન્ટ (Lophodont).
- (૫) ઘોડાનું દંતસૂત્ર આપો.

ENGLISH VERSION

Instruction : Figures to right indicates full marks.

- 1 (a) (i) Describe brain of Labeo. 7
- (ii) Describe internal structure of heart of Labeo. 7
- OR**
- (a) (i) Describe digestive system of Labeo. 7
- (ii) Describe male urinogenital system of Labeo. 7
- (b) Give Answer in short (any four) : 4
- (i) Write the habitat of Labeo.
- (ii) State type of caudalfin of Labeo.
- (iii) Which type of gills are present in Labeo ?
- (iv) State the food of Labeo.
- (v) Which type of scales are present in Labeo ?
- (vi) Why intestine is long in Labeo ?
- 2 (a) (i) Describe air sacs in Pigeon. 7
- (ii) Describe dorsal view of brain of Pigeon. 7
- OR**
- (a) (i) Describe types of feathers of Pigeon. 7
- (ii) Describe female urinogenital system of Pigeon. 7

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- (b) Give answer in short (any four) : 4
- (i) Write classification of Pigeon.
 - (ii) Give names of compartments of cloaca of Pigeon.
 - (iii) Write location of bicuspid valve.
 - (iv) Write the importance of anterior mesentric artery.
 - (v) Write the importance of hepatic vein.
 - (vi) Which type of kidneys are present in Pigeon.
- 3 (a) (i) Explain factors affecting neoteny. 7
- (ii) Explain migration in fishes. 7
- OR**
- (a) (i) Explain difference between condrichthyes and osteichthyes. 7
- (ii) Describe parental care in amphibia (Give three examples). 7
- (b) Give answer in short (any three) : 3
- (i) Write the importance of red gas gland.
 - (ii) Define : parental care
 - (iii) Explain the term : Neoteny.
 - (iv) Define : Migration.
 - (v) Explain the term : Dipnoi.
- 4 (a) (i) Explain : Birds are glorified reptiles. 7
- (ii) Describe : Dimetrodon and Pteronodon. 7
- OR**
- (a) (i) Describe adaptations of aquatic mammals. 7
- (ii) Describe comparative anatomy of aortic arches in pisces and mammals. 7
- (b) Give answer in short (any three) : 3
- (i) Explain the term : Dinosaur.
 - (ii) Define : adaptation.
 - (iii) Define : Dentition.
 - (iv) Explain the term : Lophodont.
 - (v) Write the dental formula of Horse.
-

B.Sc. (Sem.-5) Examination

CC 302

Biotechnology

March 2019

Time : 2-30 Hours]

[Max. Marks : 70

Q-1 (A) Enlist controls attached to a stirred tank bioreactor with diagram and explain its working. [14]
OR

- (A) (1) Discuss design and working of Air-lift bioreactor and give its advantages [7]
(2) Explain features and procedure for maintaining asepsis and containment with bioreactor [7]

(B) Answer in brief (Any Four) [4]

- (1) Draw labelled diagram of Bubble-column reactor
- (2) Define 'Scale-up'
- (3) Name the bioreactor most suited for cultivation of plant and animal cells
- (4) Which steel quality is recommended for construction of bioreactor?
- (5) Where is double 'O' ring used in the construction of bioreactor?
- (6) What is role of 'sampling port' in the bioreactor?

Q-2 (A) Describe electronic devices PI, PD and PIO process controls circuits attached to bioreactor [14]
OR

- (A) (1) Explain principle and working of Oxygen electrode with diagram [7]
(2) Write note on biosensors used to monitor fermentation process [7]

(B) Answer in brief (Any Four) [4]

- (1) Match the Detectors from (A) and with type of change measured from (B) in Biosensors
 - a) Amperometric / Piezoelectric / Electrochemical / Calorimetric / Optical
 - b) Light intensity / Current / Heat / Mass / Electron movement
- (2) How excessive foaming in bioreactor is controlled?
- (3) Name the device and unit that measure rotational speed of agitator shaft
- (4) What is the use of Multiple Internal Reflection Spectrometry?
- (5) Why higher aeration rate is achieved in Fluidized bed than in Packed bed bioreactors?
- (6) Aeration improves at (1) high partial pressure of Oxygen and (2) high Temperature (True / False)

Q-3 (A) Explain Oxygen transfer theory and explain Oxygen Mass Transfer Coefficient [14]
OR

- (1) Explain design of an industrial heat-exchanger and explain theory of heat transfer. [7]
(2) List the Rheological properties of fluid and explain its relevance to bioprocess [7]

(B) Answer in brief (Any Three) [3]

- (1) What is Thermal Mass Flow Control (TMFC)?
- (2) Define Growth Yield Coefficient
- (3) Define viscosity
- (4) What is purpose of Stoichiometric analysis in bioprocess?
- (5) Explain quantities in equation $Q = U \cdot A \cdot \Delta T$

Q-4 (A) Explain Chemical and Enzymatic methods for disruption of cells citing principles involved. [14]
OR

- (1) Discuss cell separation method using Foam separation technique [7]
(2) Explain liquid-liquid extraction process for product concentration [7]

(B) Answer in brief (Any Three) [3]

- (1) Name two factors affecting rate of sedimentation of suspended particle during centrifugation
- (2) Find cross sectional area for heat-exchange with double-sided 5 plates of 10x10 cm of plate-type exchangers
- (3) Write formula for Stoke's law describing rate of sedimentation
- (4) Which of the cell separation method is Not suitable for large scale operation? (Filtration / Foam separation / Centrifugation / Electrophoresis)
- (5) Name the Appliance / Technique that takes a liquid stream and separates the dissolved solid leaving the solvent as vapour

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B.Sc. (Sem.-5) Examination

CC 302

Health & Hygiene

March 2019

Time : 2-30 Hours]

[Max. Marks : 70

- Q-1 (A) List bacterial diseases of human and describe any two in detail. 14
 OR
 (A) 1. Describe in brief Causes, Symptoms and Transmission of AIDS. 7
 2. What are systemic Mycosis? 7
 (B) Answer any four in brief 4
 1. What is the other name of Thread-worm?
 2. Name the causative agent of enteric typhoid fever
 3. Write symptoms of Syphilis.
 4. Which organism causes amoebic dysentery?
 5. Name the diseases acquired by fecal oral route.
 6. Name the Virus associated with AIDS
- Q-2 (A) What are autoimmune diseases? Describe any two in detail. 14
 OR
 (A) 1. What is Graft rejection? Describe types of graft and its rejection mechanism. 7
 2. Write Causes, Symptoms and treatment of Crohn's disease and Celiac disease. 7
 (B) Answer any four in brief 4
 1. Write symptoms of Myasthenia Gravis
 2. Glucocorticosteroid are given in treatment of which disease?
 3. Which disease caused by *Borrelia*?
 4. Deficit of which body hormone causes diabetes?
 5. Which disease resembles Goiter?
 6. In which disease gluten-free diet is recommended?
- Q-3 (A) List genetic disorders and explain condition of Aneuploidy, Polyploidy and Monoploidy. 14
 OR
 (A) 1. Write Causes, Symptoms and treatment of Color-blindness. 7
 2. Briefly explain Down syndrome and Klinefelter Syndrome. 7
 (B) Answer any three in brief 3
 1. Human tumors are associated with which type of mutation?
 2. What is another term is used for Down Syndrome?
 3. What is the full form of CT Scan?
 4. Write any two symptoms of Cystic fibrosis?
 5. How RBCS are changed in condition of Sickle Cell Anemia?
- Q-4 (A) Describe any two Hormonal deficiencies showing causes, symptoms and treatments. 14
 OR
 (A) 1. Write causes, symptoms and treatment of Obsessive Compulsive Disorder (OCD) 7
 2. Write a short note on psychological disorders Dyslexia and Depression. 7
 (B) Answer any three in brief 3
 1. When woman experiences 'baby blues' syndrome?
 2. What are the symptoms of epilepsy?
 3. Emotional feeling 'high' is a condition in which mental disorder?
 4. L-Dopa is used as in initial treatment of which disease?
 5. PET Scan is used for imaging which parts of the body?

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B.Sc. (Sem.-5) Examination

CC 303

Environmental Science

March 2019

[Max. Marks : 70]

Time : 2-30 Hours]

- Q-1 (A) Write note on pesticides types and discuss its effects harmful to the environment [14]
OR
- (A) (1) Explain terms used in Toxicology and explain additive the effects of toxic material [7]
(2) Discuss toxic effects of heavy metals [7]
- (B) Answer in brief (Any Four) [4]
- (1) Name two biotransformation reactions Acetaminophen (Paracetamol) undergoes in environment
 - (2) Write two symptoms of organophosphate poisoning
 - (3) Name chemicals causing toxicity of liver
 - (4) What are symptoms of Methyl Alcohol poisoning?
 - (5) What is main harmful action of Colchicine?
 - (6) What is Threshold dosage?
- Q-2 (A) Describe Procedure and Application of Ames Test [14]
OR
- (A) (1) Explain concept of epidemiology citing suitable examples of disease outbreak [7]
(2) Write detailed note on GM crops and environmental consequences of promoting it [7]
- (B) Answer in brief (Any Four) [4]
- (1) What is cause of Silicosis disease?
 - (2) What is LD₅₀?
 - (3) Give two harmful effects of cigarette smoking
 - (4) How route of exposure affects toxic response?
 - (5) Give two biological factors affecting toxic response
 - (6) Write full name of ILO who published list of occupational diseases
- Q-3 (A) Explain method for collection, storage and segregation of solid waste management. [14]
OR
- (A) (1) List the content of Biomedical waste and discuss methods for its safe disposal [7]
(2) Write detailed note on composting process [7]
- (B) Answer in brief (Any Three) [3]
- (1) What is Pyrolysis?
 - (2) Write EPA definition of hazardous waste
 - (3) Name four solid wastes materials that can be recycled
 - (4) Differentiate between natural attenuation and containment types of landfills
 - (5) List out components to which solid waste is segregated
- Q-4 (A) List potent bacterial toxins and describe chemistry and action of toxin related to Cholera [14]
OR
- (A) (1) Discuss symptoms and treatment of Botulism [7]
(2) Describe strategy to control transmission of water-borne diseases [7]
- (B) Answer in brief (Any Three) [3]
- (1) What is mean of transmission of bacterial pathogen *Salmonella*?
 - (2) Which part of body is affected by Enterotoxin?
 - (3) Name two fungal toxins produced in stored grain
 - (4) Name two air-borne diseases
 - (5) List two methods for mosquito control

B.Sc. (Sem.-5) Examination

CC 303

Bio-Chemistry

March 2019

Time : 2-30 Hours]

[Max. Marks : 70

Instruction : Figures to right indicates full marks.

- 1 (a) Define specificity of an enzyme, Discuss it detail with all examples. 14
- OR**
- (a) (i) Differences between Enzyme Vs chemical catalyst. 7
(ii) Explain PDH complex as MEC. 7
- (b) (i) Difference between apozymes and zymozymes. 7
(ii) Explain briefly : Zymogens. (any 2 points) 2
- 2 (a) (i) Explain isoenzymes, its identification & separation with respect to LDH. 14
- OR**
- (a) (i) Short note on Metalloenzymes (with examples) 7
(ii) Short note on Membrane bound enzymes (with examples). 7
- (b) Give (molecular) structure and location differences in LDH isoenzymes (any four points) 4
- 3 (a) Give list of factors affecting enzyme activity, discuss and 5 factors in details. 14
- OR**
- (a) (i) Explain class-I of enzyme classification in detail. (with examples). 7
(ii) Differentiate giving examples : Hydrolases and Lyases. 7
- (b) Explain class 2 and 4 of enzyme classification (briefly) (any 3 points in each class) 3
- 4 (a) (i) Explain ordered, random and ping-pong mechanisms of enzyme catalysed reactions. 14
- OR**
- (a) (i) Explain properties of allosteric enzyme in details. 7
(ii) Explain any 2 allosteric enzymes in details (structures) 7
- (b) Difference between :
(i) Allosteric Vs Non-allosteric enzymes. (2 point only) 3
(ii) Glycogen phosphorylase Vs glycogen synthase.
-

B.Sc. (Sem.-5) Examination

CC 303

Statistics

Time : 2-30 Hours]

March 2019

[Max. Marks : 70

Instruction: Attempt all questions.

Q.1 (A)

- (i) What are the methods for selecting a random sample? Explain any one. [07]
 (ii) Show that in simple random sampling without replacement the variance of the sample mean \bar{y} is less than the variance in case of sampling with replacement. [07]

OR

- (i) Discuss confidence limits for population mean and total. [07]
 (ii) Show that in simple random sampling, \bar{y} is an unbiased estimator of population mean \bar{Y} and its sampling variance is given by

$$V(\bar{y}) = (1 - n/N)S^2/n \quad \text{where } S^2 = N\sigma^2/(N-1). \quad [07]$$

(B) Answer any four [04]

- (i) Define standard error.
 (ii) Define relative standard error.
 (iii) Define f.p.c.
 (iv) Define sampling fraction.
 (v) What do you understand by estimation of sample size?
 (vi) Give one disadvantage of simple random sampling.

Q.2 (A)

- (i) Explain principles of stratification. [07]
 (ii) In stratified random sampling derive the formulae for n_h and $V(\bar{y}_{st})$ under Neyman allocation. [07]

OR

- (i) Suggest an unbiased estimator of population total in stratified random sampling without replacement and derive its variance. [07]
 (ii) Show in usual notations, if f.p.c. is ignored then

$$V_{opt} \leq V_{prop} \leq V_{SR}. \quad [07]$$

(B) Answer any four [04]

- (i) Define stratified sampling.
 (ii) Give one advantage of stratified sampling.
 (iii) Give one disadvantage of stratified sampling.
 (iv) What do you mean by equal allocation?
 (v) Under what condition the optimum allocation becomes Neyman allocation?
 (vi) If someone wants to stratify the population of all the students enrolled with a university, suggest one basis of stratification.

P. T. O.

Q.3 (A)

(i) Describe the procedure of systematic sampling with the basic terminology and notations used in it. [07]

(ii) Give comparison of systematic sampling with stratified sampling. [07]

OR

(i) Give comparison of systematic sampling with SRSWOR. [07]

(ii) In usual notations prove that

$$\text{Var}(\bar{y}_{\text{sys}}) = \frac{N-1}{N} S^2 - \frac{(n-1)k}{N} S_{\text{wyp}}^2. \quad [07]$$

(B) Answer any three [03]

(i) Define systematic sampling.

(ii) Give one advantage of systematic sampling.

(iii) Give one disadvantage of systematic sampling.

(iv) In systematic sampling, what is the ratio of population size and sample size called?

(v) How is the unbiasedness of a systematic sample mean is affected if the population size is not a multiple of sample size?

Q.4 (A)

(i) Describe some situations where two-stage sampling can be used. [07]

(ii) In usual notations obtain m_{opt} and n_{opt} in two stage sampling. [07]

OR

(i) Compare two-stage sampling and stratified random sampling and deduce that the two-stage sampling is a kind of incomplete stratification. [07]

(ii) For two-stage sampling, in usual notations show that

$$\text{Var}(\bar{y}) = (1 - f_1) \frac{S_1^2}{n} + (1 - f_2) \frac{S_2^2}{nm}. \quad [07]$$

(B) Answer any three [03]

(i) Define two-stage sampling.

(ii) Give one advantage of two-stage sampling.

(iii) Give one disadvantage of two-stage sampling.

(iv) Name the statistician who named sub-sampling as two-stage sampling.

(v) When does a two-stage sampling reduce to a single stage sampling?

B.Sc. (Sem.-5) Examination

303

Electronics

March 2019

Time : 2-30 Hours]

[Max. Marks : 70

Instruction : Figures to the right indicates full marks.

- 1 (a) (i) Draw the block diagram of true RMS responding voltmeter and explain it. 7
 (ii) Draw the block diagram of average responding voltmeter and explain it. 7
OR
 (i) Draw the circuit of AC voltmeter using half wave rectifier and full wave reaction and explain it. 7
 (ii) Write considerations in choosing an analog voltmeter. 7
 (b) Attempt (any four) : 4
 (i) What is VTVM?
 (ii) Write the principle of chopped type voltmeter.
 (iii) What is difference between average responding voltmeter and peak responding voltmeter?
 (iv) Write an equation of closed loop gain of the feedback amplifier.
 (v) Draw the block diagram of an ac differential voltmeter.
 (vi) Why differential voltmeter is called potentiometric voltmeter?
- 2 (a) (i) Draw the block diagram of Ramp type DVM and explain its working. 7
 (ii) Draw the block diagram of successive approximation type DVM and explain its working with suitable example. 7
OR
 (a) (i) Draw and discuss dual slope integrating type DVM using voltage to conversion technique with suitable diagrams. 7
 (ii) Explain 3½ digit. 7
 A 3½ digit voltmeter is used for voltage measurement.
 (1) Find its resolution (2) How would 13.52 V be displayed on 10 V range
 (3) How would 0.6314 V be displayed on 1 V and 10 V range.
 (b) Attempt (any four) : 4
 (i) Write full form of SAR
 (ii) Define resolution
 (iii) Define sensitivity of digital meter.
 (iv) Draw simple sample and hold circuit.
 (v) Write disadvantage of Ramp. type DVM.

[P.T.O.]

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- (vi) The principle of voltage to frequency conversion is used in DVM.
- 3 (a) (i) Draw neat and clean block diagram for general purpose CRO and explain its working by showing the role of each block. 7
- (ii) Discuss the function of delay line & discuss the distributed parameter delay line. 7

OR

- (a) (i) Explain meshless scan expansion post deflection acceleration cathode ray tube with necessary diagram. 7
- (ii) Explain CRT circuits in detail with necessary diagram. 7
- (b) Attempt (any three) : 3
- (i) What is phosphor?
- (ii) Write the formula for modulation percentage
- (iii) Write two fluorescence materials
- (iv) What are graticules?
- (v) Write function of mesh.

- 4 (a) (i) Explain pulse characteristics and forminology wish suitable diagram. 7
- (ii) Explain pulse and square wave generators. 7

OR

- (a) (i) Draw the block diagram of laboratory square wave and pulse generator and explain its working wish necessary diagram. 7
- (ii) What is attenuater? Explain piston attenuater. 7
- (b) Attempt (any three) : 3
- (i) Define duty cycle
- (ii) Define rise time.
- (iii) Draw the block diagram of simple sine wave generator
- (iv) Write the unique characteristics of PIN diode
- (v) How many stable state Astable multivibrater has?
-

B.Sc. (Sem.-5) Examination

CC 303

Botany

March 2019

[Max. Marks : 70]

Time : 2-30 Hours]

- પ્ર. 1 (અ) ડાસ્તની વ્યાખ્યા આપો. અસનને અસર કરતાં પરીબળો જણાવો 14
અથવા
- પ્ર. 1 (અ) નોંધ લખો: (i) વૃદ્ધિ સંદર્ભે 07
(ii) બીજાંકુરલાનાં વિવિધ લક્ષણો 07
04
- પ્ર. 1 (બ) કોઈપણ મારનાં જ્વાલ આપો
(i) બાજુસ્તરીકરણ અટકે શું? 07
(ii) PPP પર કામ કરનાર વૈજ્ઞાનિકનું નામ જણાવો. 07
(iii) ક્યુલ્ટીવેશનનાં બે કારણો આપો.
(iv) વૃદ્ધિની વ્યાખ્યા આપો.
(v) શા માટે કોટેલાંક ઇલેક્ટ્રોબીયોલોજી દ્વારાતાં બીજાં અક્રીય થતા નથી? 04
(vi) RQ નું પૂર્ણનામ આપો.
- પ્ર. 2 (અ) અંચનાને આધારે પ્રોટીનનું વર્ગીકરણ કરો. 14
અથવા
- પ્ર. 2 (અ) નોંધ લખો. (i) બીજા અમ્બીડિશન 07
(ii) વિટામીન્સ નાં કાર્યો. 07
04
- પ્ર. 2 (બ) કોઈપણ મારનાં જ્વાલ આપો.
(i) ક્લોરોફિલ દ્વારાતાં અમ્બીડિશનના નામ આપો.
(ii) પામીટીક અમ્બીડિશનનાં અંક અમ્બીડિશન બીજા અમ્બીડિશન પછી કેટલા ATPs બને છે? 07
(iii) ટ્રાયગ્લીસરાઇડ્સ નું બંધારણ જણાવો.
(iv) બીજા પ્રોટીન અમ્બીડિશનનાં નામ જણાવો.
(v) જૈવિક જાદુટીજન સ્થાપન બંને કયાં ઉમેટીયા ભાગ લે છે? 07
(vi) અમેટીક અમ્બીડિશનનાં નામ જણાવો.
- પ્ર. 3 (અ) કોષિયક્રમની વ્યાખ્યા આપો. સમયિતભાજનની વિવિધ અવસ્થાઓ 14
સમજાવો. સમયિતભાજન અને અધીકરણ વચ્ચેનાં કોઈ માર તફાવત જણાવો.
અથવા
- પ્ર. 3 (અ) નોંધ લખો. (i) પોલીપીન શંકાસૂત્ર 07
(ii) કોષિયસંસ્કરણનું સેન્ટ્રીપીય મોડેલ 07
03
- પ્ર. 3 (બ) કોઈપણ ત્રણનાં જ્વાલ આપો.
(i) કોષિયભિદનની વ્યાખ્યા આપો.
(ii) કોષિયસંસ્કરણનાં કોષિયભિદન બે કાર્યો જણાવો.
(iii) અક્રમ સ્લાવાદ શું છે?
(iv) અધીકરણ-1 ની પૂર્વાવસ્થાની પેટા અવસ્થાઓ જણાવો.
(v) અધીકરણની અગત્યતા જણાવો.

પ્ર. ૫ (અ) મુકાવિકરેદી માં ગુનામિત્રું આચરેજન વર્ણવો

N 238-2

14

અથવા

પ્ર. ૫ (અ) નોંધ લખો. (i) DNA અંગુલીચુક્રણ
(ii) જનીન ચિકિત્સા

07

07

પ્ર. ૫ (બ) કાચપણ તરલાનાં જવાબ આપો.

08

- (i) સરલગનતા ની વ્યાખ્યા આપો.
- (ii) પ્રવિત ચિકિત્સા અટકે શું?
- (iii) અર્ધચરલાની કંઈ અવસ્થાએ વ્યતિકરણ થાય છે?
- (iv) પ્લી પ્રોટેક્ટ ફોસે ... વિશે તમે શું જાણો છો?
- (v) અર્ધચીન ચિકિત્સાની વ્યાખ્યા આપો.

ENGLISH VERSION

- Q.1 (A) Define respiration. Explain factors affecting the respiration. 14
OR
- Q.1(A) Write note on: 07
(i) Growth correlation 07
(ii) Different phases of germination
- Q.1 (B) Attempt any four 04
(i) What is seed stratification ?
(ii) Name the scientist who worked on PPP
(iii) Give two causes of dormancy
(iv) Define growth
(v) Why some seeds with hard seed coats do not germinate?
(vi) Give full form of R.Q.
- Q.2 (A) Classify proteins on the basis of their structure 14
OR
- Q.2 (A) Write note on: 07
(i) Beta Oxidation 07
(ii) Functions of vitamins
- Q.2 (B) Attempt any four 04
(i) Name Sulphur containing amino acids
(ii) How many ATPs are produced after beta oxidation of one molecule of Palmitic acid ?
(iii) Give composition of triglycerides
(iv) Name non protein amino acids
(v) Which bacteria play role in biological nitrogen fixation ?
(vi) Name aromatic amino acids
- Q.3 (A) Define cell cycle. Explain various stages of mitosis. Mention any four differences between mitosis and meiosis. 14
OR
- Q.3 (A) Write note on : 07
(i) Polytene chromosome 07
(ii) Sandwich model of plasma membrane
- Q.3 (B) Attempt any three 03
(i) Define cell differentiation
(ii) Mention any two functions of plasma membrane
(iii) What is unit membrane concept ?
(iv) Mention sub stages of prophase of meiosis -I
(v) Give importance of meiosis

Q.4 (A) Describe genome organization of eukaryotes 14
OR

Q.4 (A) Write note on:

- (i) DNA finger printing 07
- (ii) Gene mutation 07

Q.4 (B) Attempt any three 03

- (i) Define linkage
- (ii) What is induced mutation ?
- (iii) At which stage of meiosis crossing over takes place ?
- (iv) What do you mean by three point cross ?
- (v) Define nonsense mutation

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B.Sc. (Sem.-5) Examination

CC 303

Biotechnology

March 2019

[Max. Marks : 70]

Time : 2-30 Hours]

Q-1 A) Describe characteristics features of seaweed. (14)

OR

A1) Describe ocean productivity (7)

2) Differentiate between ocean and brackish water. (7)

B) Answer any four of the following (4)

1. What are Pneumatophores?

2. Give examples of seagrass.

3. Which of the following does not represent aquatic marine environment?

a) Brackish water b) Estuaries c) Mangroves d) Ocean

4. What is salinity?

5. Which salt is majorly found in seawater?

6. What is gross primary productivity?

Q-2 A) Describe biology of marine fishes. (14)

OR

A1) Illustrate the importance of different chemical resources obtained from marine environment. (7)

2) Describe marine planktons with suitable example. (7)

B) Answer any four of the following (4)

1. In marine environment Zn, Ni, Cu, Se are

a) Essential micronutrient b) Toxins c) Radioactive elements d) Pollutants

2. Give two examples of marine mammal.

3. Which element is major constituent of seashell?

4. *Balaenoptera musculus* refers to

a) Blue whale b) Shark c) Barnacles d) Squid

5. Write one difference between fish and mammal.

6. Molluscs are calcareous organism. (True / False)

Q-3 A) Provide a detail account on bioactive compounds obtained from marine organisms. (14)

OR

A1) Explain Importance of GFP in gene expression studies. (7)

2) Illustrate sources and applications of polysaccharides obtained from marine environment. (7)

B) Answer any three of the following (3)

1. What is source and use of Agarose?

2. What is source and use of *Taq* polymerase?

3. Sponges are prospective source of various bioactive compounds. (True / False)

4. Which protein is associated with adaption at low temperature?

5. Give importance of sea squid.

Q-4 A) Explain working principle and applications of biosensors. (14)

OR

A1) Discuss various measured used for biofouling control. (7)

2) Explain production of single cell proteins. (7)

B) Answer any three of the following (3)

1. What is difference between *in-situ* and *ex-situ* bioremediation?

2. Briefly describe pearl culture.

3. Which of the following combination is not-correct?

a) Bacteria - Biofouling b) Bacteria - Salinity c) *Dunaliella* - SCP d) Bacteria - Bioremediation

4. Give examples of marine fish cultivated via aquaculture.

5. Give application of *Spirulina* and *Dunaliella*.

B.Sc. (Sem.-5) Examination

CC 303

Health & Hygiene

March 2019

Time : 2-30 Hours]

[Max. Marks : 70

- Q-1 (A) Explain principle and objectives of microscopic examination technique. 14
OR
- (A) 1. What is Isolation? Explain technique for isolation of pure culture. 7
2. Write a short note on drug sensitivity test 7
(B) Answer any four in brief 4
1. Define Histology
 2. What is Cytochemical localization?
 3. Differentiate between SEM and TEM.
 4. Draw diagram of counting chamber used for total blood cell counting
 5. List order of stain / reagent used in Gram staining procedure
 6. What is Cryo-preservation?
-
- Q-2 (A) List diagnostic Immunological Tests and Explain any two tests in detail. 14
OR
- (A) 1. What is Immunodiffusion? Discuss its diagnostic use with suitable example 7
2. Discuss principle and application of Enzymatic assay 7
(B) Answer any four in brief 4
1. Write principle of Radioimmunoassay.
 2. Which condition is diagnosed by hormonal assay?
 3. What is Flow cytometry?
 4. Who discovered human ABO blood groups system?
 5. Write purpose of performing Widal Test?
 6. What is Tissue matching?
-
- Q-3 (A) Write Principles and Procedure of PCR technique with diagram. 14
OR
- (A) 1. Discuss principle and method for Microarray technique. 7
2. Describe genome sequencing and give its applications 7
(B) Answer any three in brief 3
1. Define Genomics.
 2. What is the end product of transcription?
 3. What is another name for PCR machine?
 4. What is Genetic Profiling?
 5. What is meaning of hybridization of nucleic acid?
-
- Q-4 (A) List biological materials collected for forensic analysis and discuss any two in detail. 14
OR
- (A) 1. Describe samples preservation in forensic science laboratory 7
2. Explain forensic analysis of case involving Pesticides. 7
(B) Answer any three in brief 3
1. Name any two narcotic drugs.
 2. Give two methods used to link meat sample to type of source animal
 3. What is Rigor Mortis?
 4. Which biological samples are looked for in the crime involving rape?
 5. Why DNA profiling is regarded a reliable evidence?

B.Sc. (Sem.-5) Examination

CC 304

Geology

March 2019

Time : 2-30 Hours]

[Max. Marks : 70

- પ્ર. ૧. (અ) ભારતના સંદર્ભમાં ભૂસ્તરીય કાળક્રમ અને તેના ઉપવિભાગોનું વર્ણન કરો. ૧૪
અથવા
- (અ) (i) સમાપ્તક પ્રદેશ અને ખડક જૂથો. ૦૭
(ii) ભૂસંચલનજન્ય ઘટનાઓ. ૦૭
- (બ) નીચેના ટૂંકા પ્રશ્નોના જવાબ આપો. (છ માંથી કોઈપણ ચાર) ૦૪
- (i) માર્ગદર્શક જીવાવશેષો એટલે શું?
(ii) પથ્વી પર જીવનની શરુઆત કેવી રીતે થઈ?
(iii) કક્ષા ખ્યાલની વ્યાખ્યા આપો.
(iv) સ્તરવિધામાં પ્રાચીન ભૌગોલિક સંજોગો કેવી રીતે ઉપયોગી છે, તે સમજાવો.
(v) સતત જીવાવશેષની વ્યાખ્યા આપો..
(vi) આગનેય ઘટનાઓ એટલે શું?
- પ્ર. ૨ (અ) ભારતની મુખ્ય રચના અને તેના સમકક્ષ વિશ્વની રચના સાથે સહસંબંધ સમજાવો. ૧૪
અથવા
- (અ) (i) પ્રમાણભૂત સ્તરવિધાત્મક યુગો. ૦૭
(ii) નિમ્ન પેલિયોઝોઇક યુગના પ્રાચીન ભૌગોલિક સંજોગો અને હવામાન. ૦૭
- (બ) નીચેના ટૂંકા પ્રશ્નોના જવાબ આપો. (છ માંથી કોઈપણ ચાર) ૦૪
- (i) હેડન ઇઓનની મુખ્ય બે ઘટનાઓ લખો.
(ii) નિમ્ન પેલિયોઝોઇક ગિરિનિર્માણ ક્રિયાનું નામ આપો.
(iii) સીલ્યુરન યુગમાં અસ્તિત્વ ધરાવતા મુખ્ય સજીવ સ્વરુપોના નામ આપો.
(iv) સીનોઝોઇક યુગની ભૂસ્તરવિધા લખો.
(v) કાર્બોનીફેરસ સમયગાળાની સ્તરવિધાનો ઉલ્લેખ કરો.
(vi) મેસોઝોઇક યુગના પ્રથમ સમયગાળાનો નામ આપો.
- પ્ર. ૩ (અ) ખોડલાઇટ, ગોંડાઇટ અને ચાર્નોકાઇટ શ્રેણી વિષે નોંધ લખો. ૧૪
અથવા
- (અ) (i) દિલ્હી સુપર ગ્રુપ. ૦૭
(ii) ઉચ્ચ કડખા રચના. ૦૭
- (બ) નીચેના ટૂંકા પ્રશ્નોના જવાબ આપો. (પાંચ માંથી કોઈપણ ત્રણ) ૦૩
- (i) સીંગભૂમ-ઓરિસ્સા વિસ્તારની આર્થિક અગત્યતા આપો.
(ii) ચાંપાનેર શ્રેણીનું સ્થાન અને આર્થિક અગત્યતાનો ઉલ્લેખ કરો.
(iii) લવચીક રેતીખડક એટલે શું?
(iv) અરવલ્લી રચનાનું વર્ગીકરણ આપો.
(v) કોડયુરાઇટનું બંધારણ આપો.
- પ્ર. ૪ (અ) રાજસ્થાન રણનો પ્રકાર, ઉદભવ, ભૂસ્તરવિધા અને કોરોમંડલ કિનારાના દરિયાઈ અતિક્રમણ સમજાવો. ૧૪
અથવા
- (અ) (i) બાગ પ્રસ્તર અને લામેટા શ્રેણી. ૦૭
(ii) કચ્છના ટર્ચરી ખડકો. ૦૭
- (બ) નીચેના ટૂંકા પ્રશ્નોના જવાબ આપો. (પાંચ માંથી કોઈપણ ત્રણ) ૦૩
- (i) ગોંડવાનામાં મળતા બે ક્લોરાના નામ આપો.
(ii) લેટેરાઇટ એટલે શું?
(iii) Rann અને Desert વચ્ચેની તફાવત દર્શાવો.
(iv) સૌરાષ્ટ્ર પ્રદેશના ડેકન ટેપના સંપર્કસ્થાન જણાવો.
(v) કરછના રણની આર્થિક અગત્યતાનો ઉલ્લેખ કરો.

- Q-1 (A) Describe geological eras and their sub divisions with reference to India. 14
- OR
- (A) (i) Petrographic provinces and rock suites. 07
(ii) Tectonic phenomena. 07
- (B) **Answer the following short questions.** (Any four out of six) 04
- (i) What are guide fossils?
(ii) How life began on earth?
(iii) Define facies concept.
(iv) Explain how palaeogeography is useful in stratigraphy.
(v) Define persistent fossil.
(vi) What are igneous phenomena?
- Q-2 (A) Explain correlation of the major Indian formations with their world equivalents. 14
- OR
- (A) (i) Standard stratigraphic eras. 07
(ii) Paleogeography and climate of Lower Paleozoic era 07
- (B) **Answer the following short questions.** (Any four out of six) 04
- (i) Write two major events of Hadean eon.
(ii) Name of orogeny of lower Palaeozoic.
(iii) Name main life forms of Silurian period.
(iv) Write geology of Cenozoic Era.
(v) Mention the stratigraphy of Carboniferous period.
(vi) Name the first period of Mesozoic era.
- Q-3 (A) Write note on Khondalite, Gondite and Charnockite series. 14
- OR
- (A) (i) Delhi Supergroup. 07
(ii) Upper Cuddapah system. 07
- (B) **Answer the following short questions.** (Any three out of five) 03
- (i) Give the economic significance of Singhbhum-Orissa area.
(ii) State the locality and economics of Champaner series.
(iii) What is flexible sandstone?
(iv) Give the classification of the Aravalli system.
(v) State the composition of Kodurite.
- Q-4 (A) Explain nature, origin, geology of Rajasthan desert and marine transgression of the Coromondal coast. 14
- OR
- (A) (i) Bagh beds and Lameta series. 07
(ii) Tertiary rocks of Kachchh. 07
- (B) **Answer the following short questions.** (Any three out of five) 03
- (i) Name two flora of Gondwana.
(ii) What is Laterite?
(iii) Distinguished between Rann and desert.
(iv) State the exposure Deccan trap in Saurashtra region.
(v) Mention economic importance of Rann of Kachchh.

B.Sc. (Sem.-5) Examination

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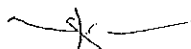
Environment Science

March 2019

Time : 2-30 Hours]

[Max. Marks : 70

- Q-1 (A) Explain pattern of shift in global climate and discuss its consequences [14]
OR
- (A) (1) Define Carbon foot print. Discuss method to find it and its importance [7]
(2) Write note on global warming and factors contributing it [7]
- (B) Answer in brief (Any Four) [4]
- (1) Define climate change
(2) List three factors responsible for climate change
(3) Name two International agencies working for climate control
(4) What is carbon credit?
(5) How carbon emission from power generation sector can be minimized?
(6) What is role of IPCC in regulating Carbon credit?
- Q-2 (A) Discuss growth of human population and explain logistic growth curve [14]
OR
- (A) (1) Discuss population aspects with Family welfare and human health [7]
(2) Explain demographic transition [7]
- (B) Answer in brief (Any Four) [4]
- (1) List two limiting factors affecting human population
(2) What are causes of population exodus?
(3) What is the rate occurrence of Tuberculosis or Malaria in India?
(4) Give two names each for Developed and Developing nations
(5) What is Human Development Index?
(6) Show advantage in age group ratio among population of India
- Q-3 (A) Write detailed note on applications of Computer in the field of environmental science [14]
OR
- (A) (1) Name software for Weather monitoring and discuss any one in detail [7]
(2) Explain General and Regional circulation models for weather forecast. [7]
- (B) Answer in brief (Any Three) [3]
- (1) What is SAS programing?
(2) Name the central government establishment monitoring weather conditions in India
(3) Who is developed / maintaining MMS weather monitoring software?
(4) What is Numerical weather prediction (NWP)?
(5) Write two factors affecting dispersal of air pollutant within an area
- Q-4 (A) Give environmental importance of decarbonization and discuss global efforts to achieve it [14]
OR
- (A) (1) Explain goals set by India for sustainable development [7]
(2) Discuss issues obstructing implementation of policies for global control of climate change [7]
- (B) Answer in brief (Any Three) [3]
- (1) Give full form of UNFCCC working to control green-house gases
(2) Why did USA differed at Paris Agreement in 2016?
(3) What targets NDC India set for 2030 at Paris Summit, 2016?
(4) Name any two countries among top three highest carbon dioxide emitting nations
(5) What is aim of Deep Decarbonization Pathways Project, global consortium formed in 2013?



B.Sc. (Sem.-5) Examination

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Bio-Chemistry

March 2019

Time : 2-30 Hours]

[Max. Marks : 70

- Q1A Discuss bacterial capsule its location, composition, functions & economic significance. (14)
OR
- Q1A(i) Draw a labeled diagram & describe the structure of bacterial flagella. (07)
(ii) List the differences between Gram Positive & Gram Negative bacterial cell wall. (07)
- Q1B **Answer any four :** (04)
1. What is single cell protein?
 2. Give one example of a spiral microorganism.
 3. Name the two chemical substances found only in bacterial Endospore.
 4. Define BOD.
 5. Name any two microorganisms involved in Nitrogen fixation.
 6. Define Pleomorphism.
- Q2 A Discuss: a) Spore staining b) Metachromatic granule staining (14)
OR
- Q2A(i) Write a note on salient features of Mycoplasmas (07)
(ii) Write a note on a) Fixation b) Mordant (07)
- Q2B **Answer any four :** (04)
1. List any two differences between Archaeobacteria & Bacteria
 2. Give any two economic importance of Fungi
 3. Define: Acidic stain. Give one example
 4. Define: Intensifier. Give one example
 5. Why do we make a smear during staining?
 6. What are Viruses?
- Q3A Discuss Nitrogen Balance in detail and the factors affecting it. (14)
OR
- Q3A(i) Discuss the role of Carbohydrates in our body. (07)
(ii) Write a note on Trans Fats. (07)
- Q3B **Answer any three :** (03)
1. What is Dietary Fibre?
 2. Why does Dental Caries occur?
 3. State any two advantages of PUFA.
 4. Give example of Supplementary value of Proteins.
 5. State the RDA of Proteins for a healthy adult.
- Q4A Explain BMR, its measurement and factors affecting it in detail. (14)
OR
- Q4A(i) State the differences between Vegetarianism and Non Vegetarianism (07)
(ii) Discuss the Nutritional value of Cereals. (07)

N253-2

Q4B Answer any three :

(03)

1. Define RQ
 2. Name and define the unit of Energy.
 3. What is SDA?
 4. What is a Balanced diet?
 5. Why Milk is called a Complete food?
-

B.Sc. (Sem.-5) Examination

CC 304

Statistics

March 2019

Time : 2-30 Hours]

[Max. Marks : 70

Q.1 (A) Write the following

- (i) Define and derive the p.d.f. of chi-square distribution with n degrees of freedom using the method of moment generating function. 07
- (ii) If X and Y are two independent χ^2 - variates with n_1 and n_2 degrees of freedom respectively, then show that $M = \frac{X}{X+Y}$ and $N = X + Y$ are independently distributed and also write the distributions of M and N . 07

OR

- (i) For a chi-square distribution with n d. f. establish the following recurrence relation for the central moments: $\mu_{r+1} = 2r(\mu_r + n \mu_{r-1}), \quad r \geq 1$ 07
hence find β_1 and β_2 .
- (ii) If Y is a chi-square variate with $n = 4$ degrees of freedom. Show that for $a > 0$, 07
$$P(Y \geq a) = e^{-\frac{a}{2}} \left(1 + \frac{a}{2} \right)$$

Q.1 (B) Write the following (any Four out of Six) 04

1. Write any two applications of chi-square test.
2. If $X \sim X^2_{(n)}$ then what is the distribution of $X/2$? Write the m.g.f of $X/2$.
3. What is the type of skewness of probability curve of chi-square distribution?
4. If $X \sim X^2_{(n)}$ then what is the value of β_1 ?
5. What is the distribution of ratio of two independent Chi-square variates?
6. If Z is standard normal variate then what is the distribution of Z^2 ?

Q.2 (A) Write the following

- (i) Show that t - distribution with n degrees of freedom tends to normal distribution for large value of n . 07
- (ii) Show that for t - distribution with $n > 4$ degrees of freedom 07
$$\beta_1 = 0 \text{ and } \beta_2 = \frac{3(n-2)}{n-4}$$

OR

- (i) For a t - variate with n degrees of freedom obtain the expression for even ordered central moments. 07
- (ii) Let U have student's t -distribution with 2 degrees of freedom. Find the probability 07
$$P(-\sqrt{2} \leq U \leq \sqrt{2})$$

P.T. 0

- Q.2 (B)** Write the following (any Four out of Six) 04
1. Write any two applications of t-test.
 2. When do we use pair t-test?
 3. Write the relation between t and F-distributions.
 4. Define briefly degrees of freedom.
 5. What is $(2r+1)^{\text{th}}$ moment about origin of t-distribution ?
 6. Write any two assumptions of t-test.

Q.3 (A) Write the following

- (i) Define F distribution and obtain its p. d. f., mean and variance. 07

- (ii) X is F-variate with 2 and n ($n \geq 2$) degrees of freedom. Show that 07

$$P(F \geq k) = \left(1 + \frac{2k}{n}\right)^{-\frac{n}{2}}$$

OR

- (i) Define Z distribution and explain any two applications of Z - test. 07

- (ii) If $X \sim F(m, n)$ then find the distribution of $V = \left(1 + \frac{mX}{n}\right)^{-1}$ 07

Q.3 (B) Write the following (any Three out of Five) 03

1. Explain Fishers' Z-transformation briefly.
2. Write the p.d.f. of sample correlation coefficient.
3. If $X \sim F(2, 3)$ then write the value of $E(X)$?
4. Write any two applications of F-distribution.
5. What is the distribution of sample correlation coefficient when population correlation coefficient is zero?

Q.4 (A) Write the following

- (i) Let X be a random variate having Poisson distribution with parameter θ and θ follows Gamma distribution. Find unconditional distribution of X. Also find mean and variance of unconditional distribution of X. 07

- (ii) Suppose X has Binomial distribution with parameter 'n' and 'p' and n is random variable and its distribution is Poisson with parameter ' λ '. Then show that compound distribution of X is Poisson distribution with parameter ' λp '. 07

OR

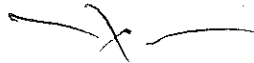
- (i) Let X be a $N(0, 1/\theta)$ where unknown parameter θ has a gamma distribution with $\alpha = u/2$ and $\beta = u/2$ with p.d.f. $g(\theta, \alpha, \beta) = \frac{\beta^\alpha}{\Gamma(\alpha)} \theta^{\alpha-1} e^{-\beta\theta}$ show that X has t-distribution with u degree of freedom. 07

- (ii) Let X be a random variate having Poisson distribution with parameter θ and θ follows standard exponential distribution. Find unconditional distribution of X also find m.g.f. of unconditional distribution of X. 07

Q.4 (B) Write the following (any Three out of Five)

03

1. State the application of compound distribution in insurance.
2. If $f(x, \theta)$ is p.d.f. of random variable X and $g(\theta, d)$ is p.d.f. of random variable θ then the unconditional distribution of X is called _____ distribution of X .
3. State mean of Poisson distribution derived as compound distribution?
4. What is the other name of unconditional distribution of X ?
5. State variance of Poisson distribution derived as compound distribution?



B.Sc. (Sem.-5) Examination

CC 304

Electronics

March 2019

Time : 2-30 Hours]

[Max. Marks : 70

Instruction : Figures to the right indicates full marks.

- 1 (a) (i) Derive the equation for the average power for sinusoidal amplitude modulation. 7
Show that the ratio of average power in any one side frequency to the total transmitted power is 1/6.
- (ii) Derive the equation for effective voltage and current for sinusoidal AM. Also explain 7
how we can monitor modulation index by measuring antenna current. If the rms antenna current of an AM radio transmitter is 10A when unmodulated and 12A when modulated, what is the modulation index?
- OR**
- (i) Derive an equation for sinusoidally amplitude modulated wave. Explain the frequency 7
spectrum.
- (ii) What do you mean by demodulation? Explain diagonal peak clipping in detail. 7
- (b) Answer in a sentence or two (any four) : 4
- (i) What is modulation?
- (ii) What is the full form of SSB
- (iii) What is the need for modulation?
- (iv) Calculate the modulation index for a carrier of 10V modulated by a sine wave of 3V.
- (v) What is overmodulation?
- (vi) A carrier of frequency 100KHz is amplitude modulated by a sine wave of frequency 1000Hz. What will be the value of lower side frequency?
- 2 (a) (i) Obtain an expression for the frequency modulated wave. What are the advantages 7
of FM in comparison to AM?
- (ii) Derive equation for a phase-modulated wave. Give a comparison between AM, FM 7
and PM, when the modulating signal is a step-wave.
- OR**
- (a) (i) An FM wave is represented by $e = 10 \sin (3.14 \times (108t + 5 \sin 6280t))V$. 7
Calculate the peak frequency deviation and modulation index. What power will the wave dissipate in a 100W load.
- (ii) Explain the equivalence between FM and PM using necessary equations. 7
- (b) Answer in a sentence or two (any four) : 4
- (1) What is the unit of frequency deviation constant?
- (2) What can you say about the average power in frequency modulated wave?
- (3) Which type of modulation is referred to as a constant-bandwidth system?
- (iv) Write the equation for peak frequency deviation.
- (v) The modulation index of a frequency modulated wave cannot be greater than one. Is this statement true or false?
- (vi) What is the equation of the modulation index of a frequency-modulated wave?

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- 3 (a) (i) Explain the principle behind working an antenna. 7
(ii) What is a dipole antenna? Discuss the advantages of using a folded dipole. 7

OR

- (a) (i) Write a note on Vagi-Uda antenna. Why is it called a super-gain antenna? 7
(ii) Explain the working of a loop aerial and how it can be used for direction finding. 7
(b) Answer in a sentence or two (any three) : 3
(i) What is the input impedance of an antenna?
(ii) Define beam-width of an antenna
(iii) What is meant by vertical polarization of an antenna?
(iv) What is an isotropic antenna pattern?
(v) Write one application of a ferrite rod aerial.

- 4 (a) (i) Draw a block diagram of satellite communication earth station and explain it. 7
(ii) Write a note on INSAT. 7

OR

- (a) (i) Explain a satellite system in detail. 7
(ii) Explain the working of fixed satellite service. 7
(b) Answer in a sentence or two (any three) : 3
(i) Write any two applications of satellite communication.
(ii) What is a geostationary orbit?
(iii) A satellite in orbit is subjected to which three forces?
(iv) What is the primary source of electric power in the space craft?
(v) What is the full form of SCDC?
-

B.Sc. (Sem.-5) Examination

CC 304

Botany

March, 2019

Time : 2-30 Hours]

[Max. Marks : 70

- QUE.-1 A. Describe-What is Succussion ? Describe its type and mechanism of ecological succession. 14
- OR
- A (i) Describe-Liebig's Law of minimum 07
- A (ii) Describe-Plant Indicator 07
- QUE.-1 B. Answer in short (Any four) 04
1. What is limiting factor?
 2. What is Hydrosore?
 3. What are analytical characters?
 4. Define-Life form
 5. What is Shelford's law of tolerance?
 6. What is Biological spectrum?
- QUE.-2 A. Describe- Any two Botanical regions of India. 14
- OR
- A (i) Describe- Endemism 07
- A (ii) Describe- Vegetation of Gujarat 07
- QUE.-2 B. Answer in short (Any four) 04
1. Name the climate regions of India?
 2. What is Phytogeography?
 3. Name the some major tree species of South Gujarat.
 4. Give the name of major soil type of India.
 5. Give two aims of phytogeography.
 6. What is continuous distribution?
- QUE.-3 A. Describe- Tea and Maize- General account, Cultivation, uses. 14
- OR
- A (i) Describe- General account of dyes 07
- A (ii) Describe- Cumin and Cardamon-botanical name, family, useful part, Chemicals and uses. 07
- QUE.-3 B. Answer in short (Any three) 03
1. Give botanical name and useful part of Coffee.
 2. Give useful part and chemicals of lemon grass.
 3. Scientific name and useful part of Sesamum
 4. Give the climate for Bajra cultivation.
 5. Chemical constituents and uses of chilies.

N 256 - 2

QUE.-4 A. Describe- Standard deviation and standard error with a suitable example. 14

OR

A (i) Describe- Simple linear Regression 07

A (ii) Describe- Chi-square 07

QUE.-4 B. Answer in short (Any three) 03

1. Give uses of Median.
2. What is range?
3. Merits of Mean
4. Name three graphs for data representation.
5. Sketch a 'pie' diagram.

GUJARATI VERSION

પ્રશ્ન-૧ (અ) વર્ણવો-અનુક્રમણ એટલે શું? અનુક્રમણના પ્રકારો અને પરિસ્થિતિકીય અનુક્રમણની ક્રિયાવિધી. ૧૪

અથવા

પ્રશ્ન-૧ (અ)(૧) વર્ણવો-લીબીગનો લઘુત્તમનો નિયમ ૦૭

(અ)(૨) વર્ણવો-વનસ્પતિ દર્શકો ૦૭

પ્રશ્ન-૧ (બ) ટૂંકમાં જવાબ આપો.(કોઇપણ ચાર) ૦૪

(૧) મર્યાદિત પરિબળ એટલે શું?

(૨) જળક્રમક શું છે.

(૩) વિશ્લેષણાત્મક લક્ષણો એટલે શું?

(૪) વ્યાખ્યાયિત કરો-જૈવસ્વરૂપો

(૫) શેલ્ડર્ડનો સહિષ્ણુતાનો નિયમ શું છે.

(૬) જૈવ વર્ણપટ એટલે શું?

પ્રશ્ન-૨ (અ) વર્ણવો- ભારતના કોઇપણ બે વનસ્પતિક પ્રદેશો ૧૪

અથવા

પ્રશ્ન-૨ (અ)(૧) વર્ણવો- ક્ષેત્રીયતા ૦૭

(અ)(૨) વર્ણવો- ગુજરાતનો વનસ્પતિ સમૂહ ૦૭

પ્રશ્ન-૨ (બ) ટૂંકમાં જવાબ આપો.(કોઇપણ ચાર) ૦૪

(૧) ભારતના આબોહવાકિય પ્રદેશોના નામ જણાવો.

(૨) વનસ્પતિ ભૂગોળ એટલે શું?

(૩) દક્ષિણ ગુજરાતમાં જોવા મળતાં વૃક્ષોના નામ આપો.

(૪) ભારતની જમીન(મૃદા) ના મુખ્ય પ્રકારો જણાવો.

(૫) વનસ્પતિ ભૂગોળના બે હેતુઓ જણાવો.

(૬) સતત વિતરણ એટલે શું?

પ્રશ્ન-૩ (અ) વર્ણવો-યા અને મકાઈ-સામાન્ય અહેવાલ, ઉછેર અને ઉપયોગો
અથવા

૧૪

પ્રશ્ન-૩ (અ)(૧) વર્ણવો-રંગકોનો સામાન્ય અહેવાલ ૦૭

(અ)(૨) વર્ણવો-જીરૂ અને ઇલાયચી-શાસ્ત્રીય નામ, કુળ, ઉપયોગી ભાગ,
રાસાયણિક ઘટકો અને ઉપયોગો. ૦૭

પ્રશ્ન-૩ (બ) ટૂંકમાં જવાબ આપો.(કોઈપણ ત્રણ)

૦૩

(૧) કોફીનું વૈજ્ઞાનિક નામ અને ઉપયોગી ભાગ જણાવો.

(૨) લેમન ગ્રાસનો ઉપયોગી ભાગ અને રસાયણો જણાવો.

(૩) તલનું વૈજ્ઞાનિક નામ અને ઉપયોગી ભાગ.

(૪) બાજરાના ઉછેર માટેની આબોહવા જણાવો.

(૫) મરચાંના રાસાયણિક ઘટકો અને ઉપયોગો જણાવો.

પ્રશ્ન-૪ (અ) વર્ણવો- પ્રમાણિત વિચલન અને પ્રમાણિત દોષ ઉદાહરણ સાથે સમજાવો.

૧૪

અથવા

પ્રશ્ન-૪ (અ)(૧) વર્ણવો-સરળ નિયત સંબંધાનાંક ૦૭

(અ)(૨) નોંધ લખો-કાય-સ્કેવર ૦૭

પ્રશ્ન-૪ (બ) ટૂંકમાં જવાબ આપો.(કોઈપણ ત્રણ)

૦૩

૧. મધ્યકના ઉપયોગો જણાવો.

૨. વિસ્તાર એટલે શું?

૩. મધ્યસ્થના ગુણો જણાવો.

૪. ડેટા રજૂઆત માટેના ત્રણ ગ્રાફ્સના નામ આપો.

૫. પાછ ડાયગ્રામનો સ્કેચ

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B.Sc. (Sem.-5) Examination

CC 304

Biotechnology

March 2019

Time : 2-30 Hours]

[Max. Marks : 70

Q-1 (A) Discuss factors affecting enzyme activity. Write Michael's Menton equation and its importance. (14)

(OR)

(A)1. Define enzyme. Explain about the classification of enzymes. (7)

2. Explain acid-base and covalent catalysis mechanism. (7)

(B) Answer any four of the following (4)

1. "Lock and key" theory of enzyme catalysis was proposed by

2. Define enzyme unit.

3. The general mechanism is that an enzyme acts by

a. reducing activation energy b. increase the activation energy c. increase in pH d. decrease in pH

4. Give an example of lyases.

5. What is turnover number.

6. The rate determining step of Michaelis-Menten kinetics is the complex dissociation step to produce products.

(True / False)

Q-2. (A) Define coenzyme. Explain role of different coenzymes in oxidation and reduction reactions. (14)

(OR)

(A)1. Discuss in brief about multienzyme complexes with an example. (7)

2. Describe the role of inhibitors and allosteric regulators in enzyme mechanism. (7)

(B) Answer any four of the following (4)

1. What is isoenzyme? Give example.

2. Write the function of Ribozymes.

3. Name the enzymes involved in feedback inhibition.

4. A non-protein chemical compound which is required for protein's biological activity is

5. Which of the following is false about lysozyme?

(a) antibacterial agent in tears and egg white (b) peptidoglycan serve as substrate (c) cleaves ($\beta 1 \rightarrow 4$) glycosidic C-O bonds between two sugar residue in NAM and NAG (d) a bisubstrate enzyme

6. What is inhibitor? Give an example.

Q-3 (A) Write a brief account of Electrophoresis and Affinity chromatography. (14)

(OR)

(A) 1. Explain about production and recovery of fungal amylases. (7)

2. Describe briefly about bioproduction of Insulin. (7)

(B) Answer any three of the following (3)

1. The first licenced drug produced through genetic engineering is

a. interferon b. insulin c. penicillin d. somatotropin

2. Salting out process involves

3. Write the principle of dialysis.

4. Name an Organism from which *Taq* polymerase is isolated.

5. Recombinant protein is defined as 'a manipulated form of protein'. (True / False)

Q-4 (A) Discuss the methods of protein/enzyme engineering. Write its applications. (14)

(OR)

(A)1. Describe briefly about immobilization techniques. (7)

2. What is biosensor. Explain enzyme and cell based biosensors. (7)

(B) Answer any three of the following (3)

1. Proteolytic modification of polypeptide is important in mechanism of protein sorting & transport (True/False).

2. What is rational protein design? Give example.

3. pollution is reduced due to the application of immobilized microbial cells.

4. Which of the following is the physico-chemical component?

a) Enzymes

b) Anti-bodies

c) Transducer

d) Cells or tissues

5. What is a supercritical fluid?

B.Sc. (Sem.-5) Examination

CC 304

Health & Hygiene

March 2019

Time : 2-30 Hours]

[Max. Marks : 70

Q-1 A. Explain life style habits imparting wellness to individual and community showing advantages of exercise [14]

OR

A. 1. List occupational diseases. Explain condition and prevention for any one. [7]
2. List any Three Yogasana and its health benefits [7]

B. Answer the following (Any four) [4]

1. What is social wellness?
2. Describe ill effects of alcoholism
3. Which work conditions likely to cause Asbetosis?
4. What are the effects of tobacco addiction?
5. Explain posture for *Sarvangasan*
6. Give two advantages of regular sleep hours

Q-2 A. Explain cells involved in immune response and describe their role in the process. [14]

OR

A. 1. List types of vaccines and discuss characteristics of ideal vaccine [7]
2. Discuss human blood group system of ABO type [7]

B. Answer the following (Any four) [4]

1. What is passive immunization?
2. Draw structure of MHC antigen
3. Write difference between Live and Attenuated vaccines
4. Differentiate between Toxin and Toxoid
5. What is Booster dose?
6. Explain schedule of dosage for oral Polio vaccine

Q-3 A. Explain modes of transmission of infectious diseases with examples disease transmission. [14]

OR

A. 1. Define epidemiology and suggest measures to control water-borne diseases [7]
2. List diseases transmitted by insect vectors and explain effective strategy for mosquito control [7]

B. Answer the following (Any three) [3]

1. What is epidemic?
2. What are 'Quarantine measures' for disease control?
3. How Tularemia infection is acquired?
4. Why is Antrax bacilli potential threat for bioterrorism?
5. Give full name and country of institute CDC working for diseases control

Q-4 A. Describe physiological changes during pregnancy and list special care needed during the phase [14]

OR

A. 1. Explain child-birth process and condition requiring surgical procedures [7]
2. Describe tubectomy procedure with diagram. [7]

B. Answer the following (Any three) [3]

1. Which gland secretes Testosterone hormone?
2. Describe the role of Estrogen hormone
3. Name two types of IUCDs
4. Name two diseases preventable by use of condoms
5. Which condition is called 'Nulligravida'?

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Candidate's Seat No : _____

B.Sc. (Sem.-5) (F & S) Examination

CC 3

Combustion Products & its Effects on Life Safety

Time : 2-30 Hours]

March 2019

[Max. Marks : 70

Q 1(A) (i) Name the various combustion products those can create the effect of irritation on various human body parts. Discuss the adverse effect in detail with different varieties of irritants. 7

(ii) Explain briefly the various Combustion products generated from fires in an industries with their characteristics properties. 7

OR

(i) What is difference between Pyrolysis and Combustion? Describe the how pyrolysis occur and gives effect on combustion. 7

(ii) What is Oxygen Depletion? Why does oxygen depletion occur in the vicinity of fire? Describe effect on human body due to varying concentration of oxygen in atmosphere. 7

Q 1(B) MCQs (Any Four) 4

(i) Asymptotic values means - as a variable or an expression containing a variable approaches a limit, usually zero. [True/False]

(ii) Isocyanates can be formed in fire when burns:

- a. Nylons
- b. Acrylic fibre
- c. Polyurethane
- d. All the above

(iii) Anemic hypoxia can occur due to:

- a. Iron
- b. CO
- c. HCN
- d. COCl₂

(iv) Hyperthermia occur due to effect of

- a. CO
- b. HCN

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E-1763-2

(vi) Examples of organic irritants :

- a. Aldehyde
- b. Formaldehyde
- c. Acrolin
- d. All the above

Q 2(A)(i) What is Green House Effect? Explain how it is formed. Describe merit and demerits of Green House Effect. 7

(ii) Explain with illustration how formation of the main toxic combustion product may be predicted from knowledge of composition of material. 7

OR

(i) What is Acid Rains? How it is formed? Explain its adverse effect on environment. 7

(ii) Describe the process of Photochemical Pollution? What are the adverse impact on human health and environment due to Photochemical Pollution? 7

Q 2(B) MCQs (Any Four) 4

(i) Anoxaemia is induced in the body by :

- a. HCN
- b. H₂S
- c. CO
- d. NO_x

(ii) Fluidised bed is used to remove coming from the burning of coal:

- a. CO₂
- b. SO₂
- c. NO_x
- d. HCl

(iii) Increasing the salt content of water changes the effect of temperature. (True / False)

(iv) Each litre of gasoline burned produces about of CO₂.

- a. 2.25 kg
- b. 2.50 kg
- c. 2.75 kg
- d. 2.85 kg

(v) Acid laden droplets, which can be as acidic as lemon juice, are washed from the air on to the soil by rain or snow is called

(vi) IDLH for CO is

E1763-3

- a. 500 PPM
- b. 800 PPM
- c. 1000 PPM
- d. 1200 PPM

Q 3(A)(i) Describe the Acute and Chronic effect of CO Poisoning due to spontaneous combustion in coal mines. 7

(ii) Discuss the properties of H₂S gas. Describe health hazards of H₂S.

OR

(i) Write symptoms of Smoke Inhalation and remedial actions. 7

(ii) How does a Hazard Management Plan work? State important recommendations referred to the hazard management plan. 7

Q 3(B) MCQs (Any Three) 3

(i) Full form of NIOSH

(ii) TWA for nitric oxide is

- a. 15 PPM
- b. 20 PPM
- c. 25 PPM
- d. 30 PPM

(iii) Following are the main harmful gases associated with spontaneous combustion

- a. HCl and HCN
- b. CO & SO₂
- c. COCl₂ & H₂S
- d. CO₂ and Water vapor

(iv) Chronic carbon monoxide exposure might increase the risk of developing the diseases in arteries :

- a. Atherosclerosis
- b. Anoxia
- c. Hypoxemia
- d. Pulmonary Edema

(v) The techniques used for early detection and prediction of spontaneous combustion is:

- a. Gas Chromatograph
- b. Mass Spectrophotometric
- c. Thermal images
- d. Audit

Q 4(A) (i) What is hyperbaric chamber? Describe safety aspect and those conditions when this treatment is suggested. 7

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E1763-4

- (ii) What are the delayed Signs, Symptoms and long-term consequences of smoke exposure among civilian victims and fire fighters? 7

OR

- (i) Write short note on Inhalation Burns. Give important control measures. 7
- (ii) Describe the various method of the rapid assessment of the patient's neurological status.

Q 4(B) MCQs (Any Three)

3

- (i) An abnormal deficiency in the concentration of oxygen in arterial blood is known as :
- Hypoxemia
 - Hypoxia
 - Anoxia
 - Atherosclerosis
- (ii) Lactic acid is produced that leads to pH drops in the cell due to effect of :
- H₂S
 - CO
 - CO₂
 - HCN
- (iii) The immediate danger to life and health toxicity for Hydrogen Cyanide is
- 50 PPM
 - 1200 PPM
 - 5000 PPM
 - 20000 PPM
- (iv) Tachycardia is caused when fire victim exposed with
- H₂S
 - CO
 - CO₂
 - HCN
- (v) Quick assessment of the patient's circulation is done using common pulse located at elbow named:
- carotid
 - brachial
 - radial
 - All the above

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B.Sc. (Sem.-5) Examination

305

Physics (C)

March 2019

Time : 2-30 Hours]

[Max. Marks : 70

Q.1 (A)

- (i) Write the basic concepts of Object Oriented Programming C++. [7]
- (ii) Write the all built in data types of C++. [7]

OR

(A)

- (i) Write a program to input data and display with class and objects. [7]
- (ii) Write a program to evaluate the following equation/series: [7]

$$\sin(x) = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \dots$$

Q.1 (B)

Fill in the blanks (Attempt Any Four). [4]

- (i) _____ extension of C++ file.
- (ii) _____ default file name of C++ file.
- (iii) _____ data type for integer value.
- (iv) _____ data type for real value.
- (v) _____ header file is used for standard input output
- (vi) _____ data type for character value.

Q.2 (A)

- (i) Write a note on multiple constructors. [7]
- (ii) Write a C++ program to add amount data in rupees and paisa format [7]

OR

(A)

- (i) Write a note on function overloading. [7]
- (ii) Write a C++ program to calculate first 10 natural numbers. [7]

Q.2

(B) True or False (Attempt Any Four). [4]

- (i) int INT;
- (ii) getch
- (iii) ***/
- (iv) return(0)
- (v) for(i=1;i<10;i++);
- (vi) //

- Q.3 (A)
- (i) Write the rules of overloading operators. [7]
 - (ii) Explain the Exception Handling with keywords: *throw, catch, try*. [7]

OR

- (A)
- (i) Write the importance of destructors. [7]
 - (ii) Write a program to add distance data in kilometers and meters format. [7]

- Q.3 (B) True or False (Attempt Any Three). [3]

- (i) $f=c*9/5+32;$
- (ii) `void main()`
- (iii) `cin>>m1>>m2;`
- (iv) `else;`
- (v) `k = k+2`

- Q.4 (A)
- (i) Explain the mode with `open()`. [7]
 - (ii) Write a program for Arithmetic Operator (+) Overloading to add time in hours and minutes. [7]

OR

- (A)
- (i) Explain the private member function with suitable example. [7]
 - (ii) Write a C++ program to display string in triangle "PHYSICS". [7]

- Q.4 (B) Fill in the blanks (Attempt Any Three). [3]

- (i) Member functions defined inside a class are ____ by default.
- (ii) Multiple line remark statement represents by ____ characters.
- (iii) ____ operator is called scope resolution operator.
- (iv) `sqrt()` from ____ header file.
- (v) ____ character used for directivity.

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B.Sc. (Sem.-5) Examination

305

Geology

March 2019

Time : 2-30 Hours]

[Max. Marks : 70

1. (अ) ખડકોના જળવિજ્ઞાકીય ગુણધર્મોનું વર્ણન કરો. 18
અથવા
- (અ) (i) ગળતા અને ઉપરીતલ જળસ્તર વિભાગો. 09
(ii) ભૂગર્ભજળના વિભાગો. 09
- (બ) નીચેના પ્રશ્નોનાં ટૂંકા ઉત્તર આપો (છ માંથી કોઈ પણ ચાર). 08
(i) ડાર્સીની નિયમ લખો.
(ii) પારગમ્યતાની વ્યાખ્યા આપો.
(iii) એક્વીટાર્ડ શું છે? તેનું ઉદાહરણ આપો.
(iv) પાતાળકુવાની વ્યાખ્યા આપો.
(v) જળવિજ્ઞાનની વ્યાખ્યા આપો.
(vi) ભૂગર્ભજળ સપાટી શું છે?
2. (અ) જળ વિભાજક વ્યવસ્થાપન પ્રયુક્તિઓનું વર્ણન કરો. 18
અથવા
- (અ) (i) ભૂગર્ભજળ સંપત્તિના સ્થાન માટે ફ્લાઇ તસ્વીરીના ઉપયોગો. 09
(ii) જળભૂસ્તરશાસ્ત્ર માં સપાટી જળસ્થળ અને સંરચનાત્મક લક્ષણોનો દૂર સંવેદન દ્વારા અભ્યાસ. 09
- (બ) નીચેના પ્રશ્નોનાં ટૂંકા ઉત્તર આપો (છ માંથી કોઈ પણ ચાર). 08
(i) જળ વિભાજક વ્યવસ્થાપન પ્રકારોના નામ લખો.
(ii) સંરચનાત્મક ભારની વ્યાખ્યા આપો.
(iii) સ્થળવર્ણન દ્રશ્ય શું છે?
(iv) જળ વિભાજકની વ્યાખ્યા આપો.
(v) જળ વિભાજકની આકૃતિ દોરો.
(vi) ફ્લાઇ તસ્વીરી કેવી રીતે લેવામાં આવે છે?
3. (અ) બાંધકામ ખડકોના ગુણધર્મોનું વર્ણન કરો. 18
અથવા
- (અ) (i) પાયાના સળંગ દિવાલ અને શેતરંજી પ્રકારો. 09
(ii) ગુજરાતમાં વપરાતા મુખ્ય પ્રકારના ઈમારતી ખડકો. 09
- (બ) નીચેના પ્રશ્નોનાં ટૂંકા ઉત્તર આપો (પાંચમાંથી કોઈ પણ ત્રણ). 03
(i) RCC નું પૂરું સ્વરૂપ આપો.
(ii) ગુજરાત યુનિવર્સિટીના ટાવરમાં વપરાયેલ બાંધકામ ખડકનું નામ આપો.
(iii) ભારતમાં બાંધકામ ખડક તરીકે વપરાતા વિકૃત ખડકોના નામ આપો.
(iv) મૃત બોજની વ્યાખ્યા આપો.
(v) જીવંત બોજ શું છે?
4. (અ) બંધસ્થાનની પસંદગી સાથે સંકળાયેલા મુદ્દાઓની ચર્ચા કરો. 18
અથવા
- (અ) (i) બંધ નિર્માણના વિવિધ હેતુઓ. 09
(ii) ગુજરાતના બંધ સ્થાનો. 09
- (બ) નીચેના પ્રશ્નોનાં ટૂંકા ઉત્તર આપો (પાંચમાંથી કોઈ પણ ત્રણ). 03
(i) બહુહેતુક બંધની વ્યાખ્યા આપો.
(ii) ચેક બંધ શું છે?
(iii) પંજાબના મોટામાં મોટા સંચયસ્થાનનું નામ આપો.
(iv) સરદાર સરોવર બંધના પ્રકારનો ઉલ્લેખ કરો.
(v) વિચરની વ્યાખ્યા આપો.

1. (A) Describe hydrological properties of rocks. 14
OR
 (A) (i) Leaky and perched aquifers. 07
 (ii) Divisions of underground water. 07
 (B) Answer the following questions in short (Any four out of six). 04
 (i) Write Darcy's law.
 (ii) Define permeability.
 (iii) What is aquitard? Give its example.
 (iv) Define artesian well.
 (v) Define hydrology.
 (vi) What is subsurface water table?
2. (A) Describe applications of watershed management. 14
OR
 (A) (i) Use of aerial photos in the location of groundwater resources. 07
 (ii) Study of surface water bodies and structural features by remote sensing in hydrogeology. 07
 (B) Answer the following questions in short (Any four out of six). 04
 (i) Name the watershed management categories.
 (ii) Define structural loads.
 (iii) What is topography?
 (iv) Define watershed.
 (v) Draw a figure of watershed.
 (vi) How aerial photos are taken?
3. (A) Describe properties of building stones. 14
OR
 (A) (i) Continuous wall and mat types of foundation. 07
 (ii) Major types of building stones used in Gujarat. 07
 (B) Answer the following questions in short (Any three out of five). 03
 (i) Give the full form of RCC.
 (ii) Name the building stone used in Gujarat University tower.
 (iii) Name the important metamorphic rocks used as building stones in India.
 (iv) Define dead load.
 (v) What is live load?
4. (A) Discuss the points associated with the selection of dam site. 14
OR
 (A) (i) Various purposes for the construction of dams. 07
 (ii) Dam sites of Gujarat. 07
 (B) Answer the following questions in short (Any three out of five). 03
 (i) Define multi-purpose dam.
 (ii) What is check dam?
 (iii) Name the biggest reservoir of Punjab.
 (iv) Mention the type of Sardar Sarovar dam.
 (v) Define weir.

B.Sc. (Sem.-5) Examination

304: Environment Science/
Biotechnolog

Biotechnolog

March 2019

Time : 2-30 Hours]

[Max. Marks : 70

Q-1 A) Describe different classes and functions of molecular chaperons. (14)

OR

A1) How Shelford's law of tolerance is related to adaption in extreme environment? (7)

2) Describe different adaptation strategies, extremophiles evolved for adaption. (7)

B) Answer any four of the following (4)

1. What is desiccation?

2. Who gave law of minimum?

3. What is HSP?

4. What is osmosis?

5. Give any two features of extremophiles.

6. What are different applications of Liebig's law?

Q-2 A) Describe physiological adaption adapted by thermophiles with example. (14)

OR

A1) Describe various biotechnological applications of thermophiles. (7)

2) How temperature can affects microbial activities? (7)

B) Answer any four of the following (4)

1. Which of the following is an enzyme is isolated from thermophilic bacteria?

a) Taq polymerase b) Pfu polymerase c) Vent polymerase d) all of above

2. What is the importance of *Thermus aquaticus*?

3. Give example of any two thermophilic sites from India.

4. GC content is higher in extremethermophiles. (True / False)

5. Give examples of any two thermophilic bacteria.

6. How thermophiles are useful in biofuel production?

Q-3 A) Describe characteristic features of halophilic genera. (14)

OR

A1) Explain water activity with its relation to halophiles. (7)

2) Describe different halophilic habitats, with example. (7)

B) Answer any three of the following (3)

1. Give any two applications of halophiles.

2. Give examples of halophilic bacteria.

3. What are different applications of halophilic enzymes?

4. How osmolytes help in halophilic adaptation?

5. Halophiles survive by lowering their water activity. (True / False)

Q-4 A) Illustrate different adaptation strategies radio-tolerance adapted for survival. (14)

OR

A1) Explain the application of Acidophiles in bioleaching. (7)

2) Differentiate between barophiles and alkalophiles? (7)

B) Answer any three of the following (3)

1. *Deinococcus* is a barophilic organisms. (True / False)

2. What are xerophiles?

3. Piezophiles are also known as

a) Barophiles b) Thermophiles c) Halophiles d) none of above

4. Give any two applications of alkalophiles.

5. Which of the following is an acidophile

a) *Helicobacter pylori* b) *Pseudomonas aeruginosa* c) *Bacillus subtilis* d) *Dunaliella salina*

B.Sc. (Sem.-5) Examination

305

Bio-Chemistry

March 2019

Time : 2-30 Hours]

[Max. Marks : 70

- Q1(A) Discuss: Isolation, purification & estimation of DNA (14)
OR
- Q1(B)1 List the properties of an ideal vector (07)
(B)2 Draw & explain various steps in gene cloning. (07)
- Q1(C) Answer the following (Any four) (04)
1. Draw & label λ phage genome
2 Give the nomenclature of restriction enzyme giving an example.
3 Name the Dye and tracker dye used in agar gel electrophoresis of DNA
4. Name two plasmid vectors, used in genetic engineering
5 Why do we use SDS in DNA isolation
6. Define Plasmid
- Q2.(A) Write a note on:
1. Southern blotting technique (14)
2. Restriction mapping.
OR
- Q2(B) Answer the followings:
1 Sanger's method of DNA sequencing. (07)
2 Discuss: Maxam & Gilbert method of DNA sequencing (07)
- Q2(C) Answer the following (Any four) (04)
1. Define : PROBE
2 Mention one use of Southern blotting technique
3. What is restriction mapping
4. State two disadvantages of Maxam & Gilbert method of DNA sequencing
5. Can we use Southern blotting technique for RNA analysis. why
6. Define : Nick.
- Q3(A) Explain the followings : (14)
1. The principle & steps of PCR.
2. Applications of PCR & its advantages over gene cloning.
OR
- Q3(B) Answer the followings :
1. Variations of PCR (07)
2. PCR vs gene cloning (07)
- Q3(C) Answer the followings (Any three) (03)
1. State the full form of PCR
2 Name the enzymes used in PCR
3. What is real-time PCR
4 State an application of PCR
5. State one disadvantage of PCR
- Q4(A) Write a note on followings: (14)
1. Mancini immunodiffusion & Ouchterlony immunodiffusion method
2 State principles behind RIA. Explain the technique & state its application

OR

PTO

P.T.O.

N272-2

- Q4 (B)1 Discuss Hybridoma technique & state its applications (07)
- (B)2 Write a note on Immuno electrophoresis (07)
- Q4(C) Answer the Followings(Any three) (03)
1. State the full form of RIA.
 2. State the fulform of : SIRD & DIRD
 3. Name the scientists who developed monoclonal antibody technique
 - 4.State one application of Immuno electrophoresis
 - 5.Define : Antigen

x — x

B.Sc. (Sem.-5) Examination

305

Statistics A & B

March 2019

Time : 2-30 Hours]

[Max. Marks : 70

Q-1(A) Explain R in detail.

[14]

OR

(A) Explain R as a statistical software.

[14]

Q-1 (B) Answer any four:

[04]

1. Write two uses of R.
2. Explain matrix function with example in R.
3. $X=2\ 3\ 4\ 5\ 6\ 7\ 8\ 9$ and $f=1\ 2\ 4\ 6\ 5\ 7\ 8\ 5$ Prepare table using R function.
4. Write any two in built function of R.
5. Explain C function with example.
6. Explain rep function with example.

Q-2 (A) Prepared a frequency distribution for following data using R program:

[14]

31	13	46	31	30	45	38	42	30	9
30	30	46	36	2	41	44	18	29	63
44	30	19	5	44	15	7	25	12	30
6	22	24	37	15	6	39	32	21	20
42	31	19	14	23	28	17	53	22	21

OR

(A) The following data relates to lives of 400 light bulbs. Write a program to draw histogram and frequency polygon on same graph paper and "less than" and "more than" type ogive curves on the same graph paper

[14]

Life of bulb	600-699	700-799	800-899	900-999	1000-1099
N0. Of bulbs	85	77	124	78	36

Q-2 (B) Answer any four:

[04]

1. 2, 3, 4, 5, 6, 7, 8, 9 find mean of this data using R function.
2. Which function is used to find mode in ungrouped data?
3. Which function is use to prepare bar plot.
4. Which function is used to find binomial probability in R?
5. Which function is used to find $F(x)$ of hyper geometric distribution in R?
6. Which function is used to select simple random sample with replacement in R?

Q-3 (A) write a program to draw scatter plots of (X_1, Y_1) and (X_2, Y_2) and fit least squares line of regression for the data given below by using x as independent variable. [14]

Y1	80.4	6.95	7.58	8.81	8.33	9.96	7.24
X1	10	8	13	9	11	14	6
Y2	9.14	8.14	8.74	8.77	9.26	8.10	6.13
X2	10	8	13	9	11	14	6

N273-2

OR

- (A) Following data pertain to the growth of a colony of bacteria in a culture medium. [14]

Bacteria count (y)	115	142	238	358	589	862
Day since incubation(x)	2	4	6	8	10	12

Write a program to plot scatter diagram of (x,v) , where $v=\log_{10}(y)$, fit a the line of regression of v on x . Also represent the fitted line on the scatter plot.

- Q-3 (B) Answer any three: [03]

1. Which function is used to find Pearson's correlation coefficient?
2. Which function is used to find Spearman's correlation coefficient?
3. Which R-command is used to test the significance of Pearson's correlation coefficient?
4. Write R command to fit quadratic model.
5. Write R command to fit cubic model.

- Q-4 (A) A series of traps were set in line across sand and the numbers of different types of insects caught in a fixed time interval are recorded to study their movement across the dune. Write a program to fit Poisson distribution and test goodness of fit for the following data: [14]

Leafhopper per trap X	0	1	2	3	4 or more
f	6	8	12	4	3

OR

- (A) Write a program in R to Simulate one random sample each from normal $(1,1)$ and $\exp(1)$ distribution. Draw box plots and qq normal plots to judge whether the parent population are normal. [14]

- Q-4 (B) Answer any three: [03]

1. Write R command to find one way analysis of variance for equality of variances.
2. Which function is used to apply a t- test to compare two vectors of numeric data?
3. Data: 3,5,7,5,3,2,6,8,5,6 and $\mu = 5$ write R command to apply t-test.
4. Which function is used to check variability?
5. Which function is used for multiple window create for graph in R?

X ← X

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Candidate's Seat No : _____

B.Sc. (Sem.-5) Examination

305

Statistics A & B &

March 2019 *Statistical Ecology* Max. Marks : 70

Time : 2-30 Hours]

Instructions:

1. All questions are compulsory.
2. Each question carries equal marks.
3. Statistical tables will be provided on request.
4. Use of scientific calculator is allowed

Q. 1 (a) Explain logistic growth model, in context to ecology

OR

- (a) Give Scope and properties of exponential model.
- (b) What is Ecology? Give names of the fields where ecology is applied.

OR

- (b) Stating Gompertz's model, mention its uses.

Q. 2 (a) Give measures to protect biodiversity.

OR

- (a) Explain force mortality, stable population and stationary population. Life table and terms associated with life tables
- (b) Write a note on Leslie Matrix?

OR

- (b) Give brief details on biodiversity and its role in ecology.

Q. 3 (a) State probability density function of log normal distribution. How it differs from Normal distribution? Give one application of log normal distribution in ecology.

OR

- (a) State the probability mass function of Geometric Distribution. State applications of Geometric distribution to ecology.
- (b) Explain in detail: Poisson Forest, Regular Spatial Pattern

OR

- (b) Explain the procedure of calculating Simpson's index.

Q. 4 (a) What is richness index?

OR

- (a) Explain exponential model. Give its applications in ecology.
- (b) Explain the procedure of calculating Shannon's index.

OR

- (b) State different capture recapture models in the literature of Statistical Ecology and explain any one of them.

Q. 5 ANSWER ANY FIVE:

- (a) Give two names of smoothing process.
- (b) How will you interpret the linear growth model?
- (c) Define closed population.
- (d) Give two limitations of exponential distribution.
- (e) State scope and limitations of Gompertz's model.
- (f) State the names to derive (i) estimator of recapture and multiple recaptures, (ii) estimator of population size



B.Sc. (Sem.-5) Examination

305

Electronics (A)

March 2019

[Max. Marks : 70]

Time : 2-30 Hours]

- 1 (A) Write the following
- With diagram explain principle, construction & working of Condenser coil Microphone. 7
 - With diagram explain construction, working & features of Moving coil Loudspeaker. 7
- OR
- With diagram explain principle, construction & working of Crystal Microphone. 7
 - Explain all Features Loudspeaker. List two advantages of Horn Loudspeaker 7
- (B) Answer the following (Any Four out of Six) 4
- In Microphone amplitude of electrical signals are proportional to _____ of sound waves.
 - S/N ratio is a ratio at output when sound pressure is ____ Pa to the output in absence of sound.
 - Microphone suffers from non-linear, _____ & phase distortion.
 - Horn loudspeaker is having efficiency about _____ %.
 - If size of baffle is much larger than _____ the wave length, it is known as infinite baffle.
 - A cross-over circuit is a _____ circuit having a cut off frequency equal to cross over frequency.
- 2 (A) Write the following
- Discuss about persistence of vision and aspect ratio in detail. 7
 - Why scanning is needed? Explain interlaced scanning in detail. 7
- OR
- Explain with diagram about Monochrome picture tube in detail. 7
 - Explain the effect of non-alignment of beam on vertical resolution. 7
- (B) Answer the following (Any Four out of Six) 4
- In cinema the number of frames per second is _____.
 - In HD Televisions systems aspect ratio is kept as _____.
 - If picture on receiver set is _____, the patten is called Raster.
 - Kell factor varies from _____ to 0.85.
 - The spectrum of wavelengths visible to human eye range from 7000 Å to _____ Å
 - Luminance is the total amount of light _____ received by eye.
- 3 (A) Write the following
- List Optical Recording Medium. Explain Tellurium-Selenium Alloys & Organic Compounds. 7
 - Explain in detail about Optical Memory Disc. 7
- OR
- Explain Evolution of Video Disc. Explain Video Disc in detail. 7
 - Explain Solid State LASER in detail. 7
- (B) Answer the following (Any Three out of Five) 3
- Full form of PAL is _____.
 - Full form of NTSC is _____.
 - _____ delivers a frame rate of 30 frame per second.
 - PAL delivers a frame rate of _____ frame per second.
 - Tellurium-Selenium Alloy is ideally suitable for _____ medium.
- 4 (A) Write the following
- With diagram explain construction, working & features of Moving coil Microphone. 7
 - Define Finite & Infinite Baffle. With diagram explain working of Electro-dynamic Loud speaker. 7
- OR
- Explain Cross-Over Circuits in detail with diagram. 7
 - Give Video disc system comparison. 7
- (B) Answer the following (Any Three out of Five) 3
- _____ converts variations of sound pressure into electrical signals of same frequency.
 - Ribbon microphone has distortion less than _____ %.
 - _____ microphone is based on piezoelectric effect.
 - Hue is the actual colour seen by _____.
 - Full form of LASER is _____.

B.Sc. (Sem.-5) Examination
305

Botany

March 2019

Time : 2-30 Hours]

[Max. Marks : 70

- સૂચના :- (૧) આપેલ બધાજ પ્રશ્નોના ગુણ સરખા છે.
(૨) જરૂર જણાય ત્યાં પ્રશ્નોના જવાબ આકૃતિ સહિત આપો.

પ્રશ્ન: ૧ (અ) બાગાયતવિદ્યાની અગત્યતા અને ઉપયોગીતા વર્ણવો. (૧૪)

અથવા

પ્રશ્ન: ૧ વર્ણવો. (અ) (i) બાગાયતવિદ્યાનાં વિવિધ પાકોનું વર્ગીકરણ (૭)
(ii) વિશિષ્ટ બાગાયતવિદ્યાની પ્રથાઓ (૭)

પ્રશ્ન: ૧ (બ) ટૂંકમાં જવાબ આપો. (કોઈપણ ચાર) (૪)

- (૧) ફળોની ખેતીને શું કહે છે ?
(૨) શાકભાજીની ખેતીને શું કહે છે ?
(૩) બોન્સાઈ એટલે શું?
(૪) બાગાયતવિદ્યામાં સ્ફેગનમ મોસની ઉપયોગીતા જણાવો.
(૫) એરોમેટીક વનસ્પતિઓ એટલે શું?
(૬) ઉદ્યાનવિદ્યા એટલે શું?

પ્રશ્ન: ૨ (અ) બાગાયતવિદ્યામાં વિવિધ વનસ્પતિ વૃદ્ધિ નિયામકોની ઉપયોગીતા વર્ણવો. (૧૪)

અથવા

પ્રશ્ન: ૨ વર્ણવો. (અ) (i) પેડોજનેસીસ (૭)
(ii) વનસ્પતિમાં K તથા Ca ની ઉણપનાં ચિન્હો (૭)

પ્રશ્ન: ૨ (બ) ટૂંકમાં જવાબ આપો. (કોઈપણ ચાર) (૪)

- (૧) જમીનનાં દ્રાવણનાં ઘટકો જણાવો.
(૨) કાંપવાળી જમીન એટલે શું?
(૩) મેન્યુરીંગ એટલે શું?
(૪) જમીનની બે ભૌતિક લાક્ષણિકતાઓનાં નામ આપો.
(૫) જમીન (મૃદા) નાં કણોનાં નામ આપો.
(૬) વનસ્પતિમાં N ની ઉણપનાં ચિન્હો જણાવો.

પ્રશ્ન: ૩ (અ) વાનસ્પતિક પ્રસંવર્ધનની પદ્ધતિઓ વર્ણવો (કોઈપણ બે) (૧૪)

અથવા

પ્રશ્ન: ૩ વર્ણવો. (અ) (i) નિર્દેશ નિયંત્રણ (૭)
(ii) શેગ નિયંત્રણ (૭)

ENGLISH VERSION

Instructions : (1) All questions are compulsory
 (2) Illustrate your answers with neat and labelled diagrams.

Que. : 1 (a) Describe Importance and Scope of Horticulture (14)

OR

Que. : 1 Describe : (a) (i) Classification of Horticultural Crops (7)
 (ii) Special Horticultural Practices (7)

Que. : 1 (b) Write brief answers (Any Four) (4)

- (1) Cultivation of fruit plant is known as?
- (2) Cultivation of Vegetable plant is known as?
- (3) What is Bonsai?
- (4) What is the use of Sphagnum moss in Horticulture?
- (5) What is Aromatic Plant?
- (6) What is Landscape gardening?

Que. : 2 (a) Describe the role of different Plant growth regulators in Horticulture (14)

OR

Que. : 2 Describe : (a) (i) Pedogenesis (7)
 (ii) Deficiency symptoms of K and Cu (7)

Que. : 2 (b) Write brief answers (Any Four) (4)

- (1) What are the constituents of Soil Media?
- (2) What is Loam Soil?
- (3) What is Manuring?
- (4) Give names of two Physical properties of Soil.
- (5) Give names of Soil particles.
- (6) What is deficiency symptoms of N in plant?

Que. : 3 (a) Describe methods of Vegetative Propagation (Any Two) (14)

OR

Que. : 3 Describe : (a) (i) Weed Management (7)
 (ii) Pest Management (7)

Que. : 3 (b) Write brief answers (Any Three) (3)

- (1) What is Hydroponics?
- (2) What is Hardening?
- (3) What is Permanent nursery?
- (4) Which chemicals used for prevention of Fruit drop.
- (5) What is the role of nif genes in Horticulture?

N275-4

Que. : 4 (a) Describe Containers and Packaging techniques and it's Local and International demand (14)

OR

Que. : 4 Describe : (a) (i) Greenhouse Cultivation (7)
(ii) Vegetable production (7)

Que. : 4 (b) Write brief answers (Any Three) (3)

- (1) Give names of any two Tuber crops
- (2) Give names of any two fruits being exported from India
- (3) What is Floriculture?
- (4) What is Organic gardening?
- (5) Give names of any two Root crops.

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B.Sc. (Sem.-5) Examination

305

Zoology

March 2019

Time : 2-30 Hours]

[Max. Marks : 70

TIME: 2½ HOURS]

[TOTAL MARKS: 70

સૂચના: 1. બધા જ પ્રશ્નો ફરજિયાત છે.

2. જરૂર જણાય ત્યાં સ્વચ્છ, નામનિર્દેશવાળી આકૃતિસહ ઉત્તર આપો.

3. દરેક પ્રશ્નનાં ગુણ સરખા છે.

4. પ્રશ્નની જમણી બાજુનાં અંક તેનાં ગુણ દર્શાવે છે.

1. A. (I) મધમાખીના નર, માદા અને કામદાર માખીના ઓળખચિન્હો આપો અને કામદાર માખીઓના કાર્યના આધારે પ્રકાર લખો. 7
(II) નોંધ લખો: આદર્શ મધપૂડો 7
અથવા
(I) વર્ણવો: મધમાખીની વિવિધ જાતો 7
(II) નોંધ લખો: મધમાખીના નૃત્ય અને તેનું મહત્વ 7
- B. ટૂંકમાં ઉત્તર આપો: કોઇ પણ ચાર 4
1. મધપૂડામા રાણી મધમાખી શા માટે એક જ હોય છે?
2. મધમાખીનું વૈજ્ઞાનિક નામ આપો.
3. મધમાખી ઉછેરમાં માખીની પસંદગી શેના આધારે થાય છે?
4. મધમાખીનું વર્ગીકરણ લખો.
5. 'ડ્રોન' મધમાખીના કાર્યો જણાવો.
6. સ્વાર્મિંગ એટલે શું?
2. A. (I) નોંધ લખો: મધમાખીની આર્થિક અગત્યતા 7
(II) મધમાખી ઉછેરની આધુનિક પદ્ધતિ વર્ણવો. 7
અથવા
(I) નોંધ લખો: મધમાખી ઉછેરમાં ઉપયોગી સાધનો 7
(II) વર્ણવો: મધમાખીનું જીવનચક્ર 7
- B. ટૂંકમાં ઉત્તર આપો: કોઇ પણ ચાર 4
1. રોયલ જેલીનું બંધારણ આપો.
2. મધમાખીની પસંદગીની વનસ્પતિઓ જણાવો.
3. મધમાખીનાં ડિમ્બનું નામ આપો.
4. કામદાર મધમાખીઓ કઇ જાતિની હોય છે?
5. કઇ જાતિની મધમાખીઓમાંથી મહત્તમ ઉપજ મળે છે?
6. ચલિત અને અચલિત મધપૂડાનો મુખ્ય તફાવત જણાવો.
3. A. (I) બોમ્બીક્સ મોરી નું વર્ગીકરણ કરી તેનાં બાહ્યલક્ષણો વર્ણવો. 7
(II) નોંધ લખો: રેશમકીટની જાતો 7
અથવા
(I) વર્ણવો : રેશમકીટ ઉછેર પદ્ધતિના વિવિધ તબક્કાઓ 7
(II) વર્ણવો: રેશમકીટનું જીવનચક્ર 7
- B. ટૂંકમાં ઉત્તર આપો: કોઇ પણ ત્રણ 3
1. સેરીકલ્ચર એટલે શું?
2. રેશમકીટનો પસંદગીનો ખોરાક જણાવો.
3. રેશમકીટના ડિમ્બનું નામ જણાવો.
4. 'ડાયપોઝ' એટલે શું?
5. રેશમકીટની 'યુનિવોલ્ટાઇન' અને 'બાયવોલ્ટાઇન' જાતો એટલે શું?
4. A. (I) નોંધ લખો: રેશમકીટ ઉછેરમા અનિવાર્ય જરૂરિયાતો 7
(II) નોંધ લખો: ઝેનેજ વ્યવસ્થાપન 7
અથવા
(I) રેશમનું રાસાયણિક બંધારણ અને તેના ઉપયોગો વિશે અહેવાલ આપો. 7
(II) નોંધ લખો: કોશિટો નિર્માણ અને તેના પછીની પ્રક્રિયા 7
- B. ટૂંકમાં ઉત્તર આપો: કોઇ પણ ત્રણ 3
1. મલબેરી શું છે? તેનો ઉપયોગ જણાવો.
2. રેશમમાં ક્યુ પ્રોટીન આવેલું હોય છે?
3. 'રીલીંગ' અને 'શીફ્ટીંગ' એટલે શું?
4. રેશમકીટના ઉછેર માટે વપરાતા રૂમને કયા રસાયણથી જંતુમુક્ત કરવામાં આવે છે?
5. 'કોશિટો' એટલે શું?

ENGLISH VERNON

- INSTRUCTIONS:** 1. ALL QUESTIONS ARE COMPULSORY
 2. GIVE YOUR ANSWER WITH NEAT AND LABELED DIAGRAM WHEREVER NECESSARY
 3. EACH QUESTION CARRIES EQUAL MARKS.
 4. FIGURE ON RIGHT INDICATES MARKS.

1. A. (I) Give identification marks of Male, Female and Worker honey bee and write types of worker bees based on their work. 7
 (II) Write note on: Typical honey hive 7
OR
 (I) Describe: Various species of honey bee 7
 (II) Write note: Dance of honey bee and its significance 7
 B. Write in brief : Any four 4
 1. Why only one queen honey bee in honey hive?
 2. Give scientific name of honey bee.
 3. On which bases bees are selected in apiculture?
 4. Write classification of honey bee.
 5. State functions of 'drone' honey bee.
 6. What is swarming?
2. A. (I) Write note : Economic important of honey bee 7
 (II) Describe modern method of apiculture. 7
OR
 (I) Write note : Tools useful in apiculture. 7
 (II) Describe: Life cycle of honey bee. 7
 B. Write in brief : Any four 4
 1. Give composition of royal jelly.
 2. State plant selection of honey bees.
 3. Give name of larvae of honey bee.
 4. Worker bees are of which caste?
 5. Maximum production obtained from which species of honey bee?
 6. State chief difference of movable and immovable honey hive.
3. A. (I) Classify Bombyx morii and describe its external characters. 7
 (II) Write note: Species of silkworm. 7
OR
 (I) Describe : Various steps of silkworm rearing method. 7
 (II) Describe : Life cycle of silkworm 7
 B. Write in brief : Any three 3
 1. What is sericulture?
 2. State food selection of silkworm.
 3. State name of larvae of silkworm.
 4. What is 'diapause' ?
 5. What does it mean by 'Univoltine' and 'Bivoltine' species of silkworm?
4. A. (I) Write note: Inevitable requirement in silkworm rearing. 7
 (II) Write note: Granage management 7
OR
 (I) Give an account t of chemical composition of silk and its uses. 7
 (II) Write note : Cocoon formation and postcocoon processing 7
 B. Write in brief : Any three 3
 1. What is Mulberry? State its uses.
 2. Silk contains which protein?
 3. What is 'reeling' and 'shifting'?
 4. By which chemical silkworm rearing room is sterilized?
 5. What is 'cocoon'?