(11)

[This question paper contains 6 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 6463 **HC**

Unique Paper Code : 32161301

Name of the Paper : Anatomy of Angiosperms

Name of the Course : **B.Sc. (Hons) Botany**

Semester : III

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Question No. **1** is compulsory and attempt **five** questions in all.
3. Draw well labeled diagrams wherever required and answer all parts of question together.

1. (a) Define **any five** of the following : (5×1=5)

   (i) Paratracheal Parenchyma

   (ii) Dermatogen

P.T.O.

(iii) Cutinization

(iv) Tension wood

(v) Intercalary meristem

(vi) Periderm

(vii) Brachysclereids

(b) Fill in the blanks **(any five)** (5×1=5)

(i) Root hairs are the extensions of .....

(ii) Cambium cells divide primarily in ..... plane.

(iii) Rods like sclereids with dilated ends are known as .....

(iv) ..... is an unbranched β-1,3 glucan.

(v) Latex yielding cells are called .....

(vi) In wood, elements of xylem are blocked by balloon like ingrowths called .....

(vii) Concentric vascular bundle in which phloem surrounds xylem is .....

(c) Give suitable examples where following are present **(any five) :** (5×1=5)

(i) Multiple epidermis

(ii) Asterosclereids

(iii) P-Proteins

(iv) Sunken stomata

(v) Bicollateral vascular bundle

(vi) Glandular trichome

(vii) Bulliform cells

2. Write short notes on the following **(any three):** (5×3=15)

(i) Korper- Kappe theory

(ii) Ergastic substances

(iii) Adcrustation and Incrustation

(iv) Lenticels

(v) Applications of plant Anatomy in Pharmacognosy

3. Answer the following : (5×3=15)

(i) What are growth rings ? Discuss their formation with suitable diagrams.

(ii) Explain the changes that take place during transformation of sap wood into heart wood.

(iii) Give a detailed account of types of stomata present in angiosperms with suitable example.

4. Differentiate between any **five** : (5×3=15)

(i) Sclereids and Fibres

(ii) Endodermis and pericycle

(iii) Dicotyledonous and monocotyledonous leaf

(iv) Perforation plate and Sieve plate

(v) Fusiform and Ray initials

(vi) Resin duct and Oil cavity

(vii) Early and Late wood

5. Draw well-labelled diagrams of **any three** : (5×3=15)

(i) Structure of Bordered pit in L.S

(ii) T.S of monocotyledonous root

(iii) V.S of a leaf showing Kranz anatomy

(iv) T.S of *Cucurbita* stem

(v) V.S of leaf showing lithocyst

6. Give a detailed account of any **two** : (7.5×2=15)

(i) Trace the sequence of changes that are involved in the cytodifferentiation of tracheary elements.

(ii) Give a detailed account of the anatomical adaptations in leaf and stem of xerophytes with suitable examples.

(iii) Describe the origin of lateral root.

7. Answer **any two** of the following : (7.5×2=15)

(i) Describe the various theories of shoot apex organization.

(ii) Describe the secondary growth in a dicotyledonous stem.

(iii) Describe the characteristic features of meristematic tissues ? What are the various types of meristem and their function ?

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This question paper contains 4 printed pages] 13/12/17

Roll No. | | | | | | | | | | | |

S. No. of Question Paper : **6464**

Unique Paper Code : **32161302** **HC**

Name of the Paper : **Economic Botany**

Name of the Course : **B.Sc. (Hons.) Botany**

Semester : **III**

Duration : **3 Hours** Maximum Marks : **75**

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt any *five* questions.

Question No. **1** is compulsory.

Draw diagrams and write botanical names wherever necessary.

All parts of a question must be answered together.

1. (*a*) Give the botanical names of the following. Attempt any *five* of the following : 5×1=5

(*i*) Plant used in treatment of circulatory disorders.

(*ii*) Clearing agent for histology

(*iii*) Golden fibre of India

(*iv*) Leaf used in making bidi

(*v*) The legume causing lathyrism

(*vi*) The source of "Shahi Zafran".

P.T.O.

(*b*) Expand and write the place where the institutes are located (any *five*) : 5×1=5

(*i*) CRRI

(*ii*) NBPGR

(*iii*) RRIM

(*iv*) CIMMYT

(*v*) FRI

(*vi*) CIP.

(*c*) Explain the following terms. Attempt any *five* of the following : 5×1=5

(*i*) Psychedelic drugs

(*ii*) Ratooning

(*iii*) Ginning

(*iv*) Tapping

(*v*) Enfleurage.

2. Differentiate between the following (any *five*) : 5×3=15

(*i*) Heart wood and Sap wood

(*ii*) Bast fibre and Leaf fibre

(*iii*) Essential oils and Fatty oils

(*iv*) Assam tea and China tea

(*v*) *Nicotiana tabacum* and *Nicotiana rustica*

(*vi*) Charas and Ganja

(*vii*) Primary and secondary centres of origin of cultivated plants.

3. Write short notes on any *three* of the following 3×5=15

(*i*) Processing of black tea

(*ii*) Uses of Quinine tree

(*iii*) Methods of extraction of fatty oils

(*iv*) TPS

(*v*) Classification of fibres on the basis of origin.

4. Draw well-labelled diagrams of the following giving botanical name and family (any *three*) . 3×5=15

(*i*) T.S. of Jute stem

(*ii*) L.S. of Clove flower bud

(*iii*) Branching pattern of Coffee

(*iv*) Cross-section of Potato tuber

(*v*) L.S. of Peppercorn.

5. (*a*) Give the botanical name and the principal state of India where the following are extensively grown. Attempt any *five* of the following : 5×2=10

(*i*) Saffron

(*ii*) Cotton

(*iii*) Rubber

(*iv*) Tobacco

(*v*) Sugarcane

(*vi*) Coconut

(*vii*) Coffee.

(*b*) Describe the health hazards and uses of opium. 5

6. (*a*) Comment upon the statement that groundnut flowers are aerial but fruits develop underground. 5

(*b*) What are millets ? How are they important to mankind ? 5

(*c*) Write botanical name, family and active constituents of any *two* of the following : 2×2.5=5

(*i*) Black pepper

(*ii*) Tea

(*iii*) Tobacco

(*iv*) Fennel.

7. (*a*) What is cane sugar ? Write an account of the commercial production of sugar. 5

(*b*) Briefly describe the uses of rubber. 5

(*c*) Match the following : 5

(*i*)	Kalpavriksha	Euphorbiaceae
(*ii*)	Golden tip	Lancing
(*iii*)	Para-rubber	Coconut
(*iv*)	Multipurpose crop	Tea
(*v*)	*Papaver*	*Cannabis* species.

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This question paper contains 4+1 printed pages]

16/12/17

Roll No. | | | | | | | | | | | |

S. No. of Question Paper : **6465**

Unique Paper Code : **32161303** **HC**

Name of the Paper : **Genetics**

Name of the Course : **B.Sc. (H) Botany**

Semester : **III**

Duration : **3 Hours** Maximum Marks : **75**

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt *five* questions in all.

Question No. **1** is compulsory.

1. (*a*) Give the technical term used to describe the following : 5

(*i*) The phenomenon in which a cross between a red-flowered and a white-flowered snapdragon results in pink-flowered progeny.

(*ii*) Inactivated X-chromosome in mammalian female.

(*iii*) When the expression of a trait in the progeny is less or more than that of the parents.

(*iv*) *Drosophila* individuals expressing both male and female sexual characteristics.

(*v*) A cross between an individual of unknown genotype and a recessive homozygote.

P.T.O.

(*b*) Explain any *five* of the following terms briefly : 5

(*i*) Alleles

(*ii*) Pseudodominance

(*iii*) Homologous chromosomes

(*iv*) Frameshift mutations

(*v*) Penetrance

(*vi*) Non-disjunction.

(*c*) Match the following : 5

(*i*)	Lethal genes	Karl Landsteiner
(*ii*)	ABO blood groups	Creighton & McClintock
(*iii*)	Cytoplasmic inheritance	Nilsson-Ehle
(*iv*)	Polygenic inheritance	Boris Ephrussi
(*v*)	Cytological evidence of crossing over	Lucien Cuénot

2. (*a*) Explain with the help of diagrams why recombination never exceeds 50%. 8

(*b*) What are pleiotropic genes ? Explain with the help of *two* examples. 5

(*c*) What will be the chromosome constitution of an individual with : 2

(*i*) Turner syndrome

(*ii*) Down syndrome.

3. Write short notes on any *three* : 3×5=15

(*a*) Hardy-Weinberg law

(*b*) *Cis-trans* complementation test for functional allelism

(*c*) Variegation in *Mirabilis jalapa*

(*d*) Chromosome theory of inheritance.

4. Differentiate between any *five* : 5×3=15

(*a*) Multiple alleles and multiple genes

(*b*) Alkylating and intercalating agents

(*c*) Epistasis and dominance

(*d*) Paracentric and pericentric inversions

(*e*) Euploidy and aneuploidy.

(*f*) X-linked genes and holandric genes.

5. (*a*) Explain the ClB method for detection of mutations. 8

(b) In pea, tall plant and yellow pods are dominant traits. A tall pea plant with yellow pods was crossed with a dwarf pea plant with green pods and resulted in the following progeny. 3

1 tall yellow : 1 tall green : 1 dwarf yellow : 1 dwarf green

Provide the diagrammatic representation of the cross.

(c) What are the ways in which triploids can arise ? Provide appropriate examples. 4

6 (a) How many different types of gametes would be produced by the following individuals : 4

(i) AaBbCc

(ii) AABbCcDDEe

(iii) AaBBCCddEe

(iv) aaBbCcDdEe

(b) Explain the genetic basis of continuous variation in detail. 6

(c) A man with an autosomal dominant trait is married to a normal woman. His daughter expresses the trait but his son does not. The daughter marries a normal man.

(i) Represent the data as a pedigree with genotypes of all individuals. 3

(ii) What is the probability of the daughter passing the trait to her children ? 2

7 (a) Consider *p*, *q* and *r* to be three recessive mutations in *Drosophila*. An F_1 female heterozygous for all three loci was test crossed and the following progeny obtained :

+ + +	67
+ *q* +	10
p q +	68
p + +	347
p q r	78
+ + *r*	54
+ *q* +	368
p + +	8
Total	**1000**

(i) Are the above genes linked ? Give reasons for your answer. 2

(ii) Provide a diagrammatic representation of the cross. 3

(iii) Construct a map of the three genes. 3

(iv) Calculate the interference. 2

(b) Discuss allopatric and sympatric modes of speciation. 5

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This question paper contains **4** printed pages]

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Roll No. | | | | | | | | | | | |

S. No. of Question Paper : **6981**

Unique Paper Code : **32163302** **HC**

Name of the Paper : **Intellectual Property Rights**

Name of the Course : **B.Sc. (H) Botany/B.Sc. (Prog.) : SEC**

Semester : **III**

Duration : **3 Hours** Maximum Marks : **75**

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt any *five* questions.

Question No. **1** is compulsory.

All questions carry equal marks.

Attempt all parts of a question together.

1. (A) Expand the following abbreviations (any *five*) : 1×5=5

(*i*) TRIPS

(*ii*) WIPO

(*iii*) USPTO

(*iv*) NBPGR

(*v*) TKDL

(*vi*) CBD

(*vii*) CGPDTM

P.T.O.

(B) State True *or* False : 1×5=5

(*i*) Mysore agarbathi is a GI.

(*ii*) Photographs do not have copyright protection.

(*iii*) Domain names may be protected under the Trademarks Act in India.

(*iv*) Agricultural methods are not patentable in India.

(*v*) Furniture design comes under IPR

(C) Match the following : 1×5=5

(*i*) Logo	(*a*) Simla
(*ii*) Darjeeling tea	(*b*) Copyrights
(*iii*) Photographs	(*c*) Cuttack
(*iv*) Central Potato Research Institute	(*d*) Trademark
(*v*) Central Rice Research Institute	(*e*) Geographic Indication

2. (A) Define the following with *one* example each (any *five*) : 2×5=10

(*i*) Patents

(*ii*) Copyrights

(*iii*) Trademarks

(*iv*) Biological Database

(*v*) Industrial design

(*vi*) GM crops

(*vii*) Concept of novelty.

(B) Write a brief note on rights of farmers under the Plant Varieties and Farmers Act in India. 5

3. Write short notes on any *three* of the following : 3×5=15

(*a*) Domain name protection

(*b*) Non-patentable inventions

(*c*) Types of Trademarks

(*d*) Subject matter of Copyright Act

(*e*) Protection of semi-conductor chips.

4. Differentiate between any *three* of the following : 3×5=15

(*a*) Process patents and Product patents

(*b*) Trademarks and GI

(*c*) Bio-piracy and Bio-prospecting

(*d*) Infringement and Passing off.

5. Attempt any *two* of the following : 2×7.5=15

(*a*) Define GI. Discuss the criteria for granting GI to a product. Give *two* examples.

(*b*) What is traditional knowledge ? Why does it need protection ? Discuss the role of TKDL in protecting traditional knowledge.

(*c*) Discuss the importance of Patenting Biotech Inventions.

6. Attempt any *two* of the following : 2×7.5=15

(*a*) What are the rights associated with registration of trademarks ? Discuss the grounds of refusal of registration of trademarks.

(*b*) Industrial design is protected by patents, trademarks and copyrights. Explain.

(*c*) Comment on The Patents Act, 1970 and its Amendments.

(15)

[This question paper contains 6 printed pages.] 4/12/17

Your Roll No.....

Sr. No. of Question Paper : 5576 **H**

Unique Paper Code : 216301

Name of the Paper : BTHT 304 : Plant Resource Utilization

Name of the Course : **B.Sc. (H) Botany**

Semester : III

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **five** questions.
3. Question No. **1** is compulsory.
4. **All** questions carry equal marks.
5. Attempt all the sub questions together.

1. (a) Fill in the blanks : (10×0.5=5)

(i) .....is a geocarpic fruit

P.T.O.

(ii) .....Man made cereal

(iii) .....source of myocardial glycosides

(iv) Source of drying oil.....

(v) ..... fruit is a hesperidium

(vi) Center of origin of potato is.....

(vii) Tetraploid cotton is.....

(viii) Noblelization is used in improving of.....

(ix) Curing is used in improving of.....

(x) Quinine is obtained from.....

(b) Give botanical name and family of the following : (1×5=5)

(i) Mango

(ii) Cassava

(iii) Fennel

(iv) Para-rubber

(v) Teak

(c) Match the following : (0.5×10=5)

(i) lemongrass	a) ginning
(ii) oryza	b) potato
(iii) porus wood	c) female plant
(iv) pepper	d) chicory
(v) Fatty oil	e) stigma
(vi) *Cannabis*	f) teak
(vii) TPS	g) antioxidant
(viii) Coffee	h) perisperm
(ix) Saffron	i) parboiling
(x) cotton	j) Mosquito repellent

2. Write short notes on **any three** of the following : (3×5=15)

(i) Importance of legumes to men and economy of nature

(ii) Millets

(iii) Tobacco and health hazards

(iv) Seasoning of timber

(v) By-products of sugarcane industry

3. Differentiate between any **three** of the following : (3×5=15)

(a) Essential oils and fatty oils

(b) Heartwood and softwoods

(c) Indica and Japonica rice

(d) Bast fiber and surface fibers

(e) Green tea and black tea

4. Write botanical name, family, part/parts and uses of the following **(any five)** : (5×3=15)

(a) Coconut

(b) Poppy

(c) Turmeric

(d) Papaya

(e) Cotton

(f) Plant showing cauliflory

5. Write brief account of any **three** of the following : (5×3=15)

(i) Retting of jute

(ii) Origin of hexaploid wheat

(iii) Centers of origin of crop plants

(iv) Processing of coffee

6. (a) Comment on the following statement. Attempt **any four** of the following : (3×4=12)

(i) Hydrogenated end product of fatty oil has better keeping quality than the fatty oil itself

(ii) Dwarf varieties have played an important role in increasing the productivity in wheat and rice

(iii) Opium is both useful and problem for mankind

(iv) Spiral method of tapping is the superior most method

(v) Domestication has results in loss of genetic diversity

(vi) *Cannabis* is a multi-purpose plant.

(b) Expand **any three** of the following : (1×3=3)

(i) IRRI

(ii) CRRI

(iii) CTRI

(iv) NBPGR

(v) CIMAP

7. Write an account of morphology, breeding and processing of sugarcane. (15)

OR

Write an account of morphology and processing of tea (or) tobacco.