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COURSE ATTAINMENT EVALUATION OF POST GRADUATE STUDENTS (2020-2022 BATCH)

SEMESTER1 BY010101 MICROBIOLOGY AND PHYCOLOGY-THEORY (Each questions carry 2 points)			
Course Outcome	Question number	Question	Answer
CO1: Gain adequate knowledge on systematic classification of various algal divisions (Remember)	1	How many classes are therein Fritsch Classification of Algae a)7 b)11 c)12 d)14	b)11
	2	Prokaryotic cells are more resistant to osmotic shock than eukaryotic cells because a)Their cell wall is composed of peptidoglycan b)They are selectively permeable c)They contain osmoregulating porins d)They block water molecules from entering the cell	a)Their cell wall is composed of peptidoglycan
CO2: Study and impart knowledge about the Occurrence, distribution, structure and life history of lower plants such as algae (Understand).	3	Agar is obtained from a)Chlorophyta b)Chrysophyta c)Phaeophyta d)Rhodophyta	d) Rhodophyta
	4	Which is a rich source of protein a)Nostoc b)Anabaena c)Spirullina d)Oscillatoria	c)Spirulina
CO3: Apply the knowledge of microbes and find the importance of the study of microbiology in personal Social life (Apply).	5	Which of the following is not a recognised cause of diarrhoea? a)*Vibrio cholerae* b)*Escherichia coli* c)*Clostridium perfringens* d)*Enterococcus faecalis*	d) *Enterococcus faecalis*
	6	Which of the following are produced by microorganisms? a) Alcoholic beverages b) Fermented dairy products c) Breads d) All of the mentioned	d) All of the mentioned
CO4: Find the differences among various forms of microbes such as bacteria and Virus (Analyse)	7	Which scientist proposed adding a kingdom for protists? a)Carolus Linnaeus b)Carl Woese c)Robert Whittaker d)Ernst Haeckel	c) Robert Whittaker

	8	Which of the following is the standard resource for identifying bacteria? *Systema Naturae* Bergey's *Manual of Determinative Bacteriology* Woese and Fox's phylogenetic tree Haeckel's *General Morphology of Organisms*	b) Bergey's *Manual of Determinative Bacteriology*
CO5: Explore the role of microorganisms in Life of plants either as friend or foe and the interrelations within microorganisms and among other life forms (Evaluate).	9	Which among the following is a pathogenic algae for humans? a) Cephaleuros b) Acanthopeltis c) Chlorella d) Prototheca	d) Prototheca
	10	Vaccination was invented by _____ a) Watson b) Jenner c) Crick d) Pasteur	b) Jenner
CO6: Experiment the culture and and preservation of microbes of economic value (Create).	11	In pour-plate method, the medium should be maintained at what temperature? a)37 degree C b) 67 degree C c) 45 degree C d) 0 degree C	c)45 degree C
	12	Which of the following method can be used to determine the number of bacteria quantitatively? Streak-plate b) Spread-plate c) Pour plate d) Pour-plate and spread plate	d) Pour-plate and spread plate

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SEMESTER1 BY010102 MYCOLOGY AND CROP PATHOLOGY-THEORY			
CO1: Understand the characteristic features of fungi and lichens (Remember)	1	Fungus/Lichens which grow on wood is (a) Terricolous (b) Saxicolous (c) Lignocolous (d) Corticolous	c
	2	Ainsworth has placed *Rhizopus* in (a) Zygomycetes (b) Mastigomycotina (c) Ascomycotina (d) Myxomycotina	a
CO2: Classify fungi with respect to mycelial organization and reproductive methods (Understand)	3	In lichens, sexual reproduction belongs to (a) Algal partner only (b) Fungal partner only (c) Fungal and algal partners (both) (d) Either fungal partner or algal partner (not both)	b
	4	Pseudomycelium is formed in (a) Rhizophora (b) Aspergillus (c) Yeast (d) Synchytrium	c
CO3: Understand the principles of plant pathology and disease management (Apply).	5	Which one of the following microbial agents is being commercially exploited as biocontrol agent ? (A) Bacillus subtilis (B) Penicillium notatum (C) Sclerotium rolfsi (D) Trichoderma viride	d
	6	Application of potash increases (A) Resistance to water logging (B) Frost resistance in plants (C) Disease resistance in plants (D) None of these	c
CO4: Understand the common diseases affecting plantation crops (Analyse).	7	The causal organism of bunchy top of banana is transmitted by– (A) Peutalonia nigroneruosa (B) Bemisia tabaci (C) Lipaphis erisimi (D) Pollen	a

	8	Damping off and leaf blights are very effectively checked by– (A) Bordeaux mixture (B) Burgundy mixture (C) Thirarn (D) Copper oxychloride	d
CO5: Understand the basics of plant quarantine measures (Evaluate).	9	When plant showed the partial resistance against all the races of pathogen then it is a type of ? (A) Horizontal resistance (B) Vertical resistance (C) Induced resistance (D) Non-host resistance	a
	10	Which type of spores of Puccinia graminis tritici infect the barberry plant ? (A) Teliospores (B) Urediospores (C) Aeciospores (D) Basidiospores	d
CO6: Develop and gain skill to identify plant diseases based on symptoms (Create).	11	Name the disease of plant in which large yellow spot appears on the leaves? A. Bacterial Blight B. Bacterial Spot C. Aphids D. Botrytis	a
	12	In which disease of plant stem rot at soil line with brown to red lesions? A. Rhizoctonia B. Angular leaf Spot C. Bacterial Blight D. Bacterial Spot	a

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SEMESTER1 BY010103 BRYOLOGY AND PTERIDOLOGY -THEORY (Each questions carry 2 points)			
Course Outcome	Q. No	Question	Answer
CO1: Trace the origin and evolution of Bryophytes and Pteridophytes (Remember)	1	The spread of living pteridophytes is limited and restricted to narrow geographical regions. It is due to_____ (a) specific requirement and the need for water for fertilisation (b) requirement for water and mineral conducting tissues (c) requirement for air for spore dispersal (d) all of these	c
	2	The member of class filicinae in pteridiophytes date back to a)mesozoic era b)Paleozoic era c)Cenozoic era d)Cambrian	b
CO2: Describe traditional and modern systems of classification of Bryophytes and Pteridophytes (Understand)	3	Father of Indian bryology is (a)Raj Kumar (b)S.R. Kashyap (c)Maheshwari (d)Khurana	b
	4	Phloem is without _____ in pteridophytes (a) Bast fibres (b) Companion cells (c) Phloem parenchyma (d) sieve cells	b
CO3: Explore the external morphology, anatomy and reproduction in Bryophytes and Pteridophytes (Apply)	5	Mature ligule has prominent basal portion called a)Stipule b)Protocorm c)Glossopodium d)Stipe	c
	6	……..is primitive type stele a)Solenostele b)Siphonstele c)Protostele d)Polycyclic stele	c
CO4: Analyse diverse nature of natural habitats preferred by Bryophytes and Pteridophytes (Analyse)	7	In mosses, meiosis takes place during (a) gamete formation (b) antheridia and archegonia formation (c) spore germination (d) spore formation	d
	8	Which among the following is also known as bog moss? (a) Riccia (b) Sphagnum (c) Marchantia (d) Funaria	b

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CO5: Find out the evolutionary evidences among the members of the groups Bryophytes and Pteridophytes (Evaluate)	9	The only positive evidence of the aquatic ancestory of bryophytes is a)thread like protonema b)ciliated antherozoids c)their green colour d)some forms are still aquatic	b
	10	Coal is formed by? a)Pteridophytes b)Bryophytes c)Fungi d)Bacteria	a
CO6: Find out the economic aspects and importance of conservation required among the members of Bryophytes and Pteridophytes (Create)	11	Which bryophyte is of considerable economic value ? a) Pogonatum b) Sphagnum c) Funaria d) Marchantia	b
	12	Which of the following plants are heter ospor ous.? (a) Selaginella, Lycopodium (b) Pteris, Adiantum (c) Psilotum, Equisetum (d) Selaginella, Salvinia	b

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SEMESTER1 BY010104 GYMNOSPERMS, PALAEOBOTANY AND EVOLUTION- THEORY (Each questions carry 2 points)			
Course Outcome	Q. No	Question	Answer
CO1: Origin and Evolution of land plants (Remember).	1	Nipaniophyllum belonging to a)Bennettitales b)Filicales c)Cordaitales d)Pentoxylales	d
	2	Endosperm in Angiosperms is: (a) Haploid (b) Diploid (c) Triploid (d) None	c
CO2: Study the classification systems, natural occurrence and diversity at various natural habitats of gymnosperms (Understand).	3	The most advanced order in gymnosperms a)Cycadales b)Coniferales c) Gnetales d)Taxales	c
	4	Pollen bearing organs of Lygenopteris belongs to a)Cycadeoidea b)Crossotheca c)Calamittotheca d)Williamsonia	c
CO3: Study the Indian gymnosperms and research on that group (Apply).	5	In gymnosperms pollination is exclusively by a)Wind b)Water c)Animals d)Insects	a
	6	Largest sperms are found in a)Pinus b)Cycas b)Gnetum d)Cedrus	b
CO4: Economic importance of Gymnosperms (Analyse)	7	Pinus is related to a)Coralloid roots b)Mycorrhizal roots c)Red wood tree d)Coal tar	b
	8	Canada Balsam is obtained from a)Abies b)Pinus c)Cycas d)Taxes	a
	9	Generative cell represents the reduced:	a

CO5: Specific characters of the group Gymnosperms and how they adapt to xeric conditions (Evalutae)		(a) Antheridium (b) Archegonium (c) Oogonium (d) Antherozoids	
	10	Which of the following is incorrect? a) Phanerogams contain specialized reproductive organ and don't follow cryptogamae b) Phanerogams are classified as Gymnosperms and Angiosperms based on the type of seed they produce c) 12Gymnosperms have covered seeds and Angiosperms have naked seeds d) Angiosperms bear fruit whereas Gymnosperms don't	c
CO6*:Exsitu* conservation of Gymnosperm flora in Gardens (Create)	11	Which of the following species of Pinus has trifoliar spur a) P. sylvestris b) P. merkusii c) P. gerardiana d) P. wallichiana	c
	12	The abortive female flower in the male cone of Gnetum can be distinguished from the normal ovules of the female cone apart from its function by the presence of …. a) no envelops b) single envelope c) two envelopes d) several envelops.	b

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SEMESTER1 BY010105 PRACTICAL COURSE I –
MICROBIOLOGY, PHYCOLOGY, MYCOLOGY AND CROP PATHOLOGY
(Each questions carry 2 points)

Course Outcome	Q. No	Question	Answer
CO1: Understand the general identification features of algae (Remember)	1	Asexual reproduction in Spirogyra (A) takes place by zoospore formation (B) has not been recorded (C) takes place by hypnospore formation (D) takes place by aplanospore formation	d
	2	Heterocysts are found in (A) Nostoc (B) Cystopus (C) Ulothrix (D) Aspergillus	a
CO2: Understand the procedures for microscopy (Understand)	3	The resolution power of the compound microscope is a. 0.2 micron b. 0.2 millimeter c. 0.2 Angstrom units d. 0.2 centimeter	a
	4	If 10x and 40x objectives are used (air is the medium), the numerical aperture is a. 1.5 b. 2.0 c. 1.0 d. 1.8	c
CO3: Identification techniques for microbes and algae (Apply)	5	Bioluminescence is a phenomenon associated with (A) chrysophyta (B) phaeophyta (C) pyrrophyta (D) chlorophyta	c
	6	E.coli was first isolated by a. Louis Pasteur b. Escherich c. Shiga d. Robert Koch	b
CO4: Identification of fungi from field (Analyse)	7	The back coloured spots in bread mold is a)sporangia b)Zoozpore c)mycelium d)sporangiophore	a

	8	A macrofungi showing gills may belongs to a)Agaricales b)Polyporales c)Physarales d)Aspergillales	a
CO5:The use of plant protection measures and integrated pest management (Evaluate)	9	Heavy application of urea to the nursery soil may cause. a).phytophthora sp. b).fusarium sp. c).pythium sp. d).all of them	a
	10	Bordeaux mixture was first time used for the control of a) Late blight of potato b) Anthracnose of Citrus c) Powdery mildew diseases d)Downey mildew of Grapes	d
CO6: Pinpoint the causative organisms by symptoms of diseases (Create).	11	Black rust of wheat is caused by a)Albugo b)Puccinia c)Claviceps d)Phyophthora	b
	12	White rust of Crucifer is caused by a)Albugo b)Crcospora c)Claviceps d)Phyophthora	a

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SEMESTER1 BY010106 PRACTICAL COURSE II
BRYOLOGY, PTERIDOLOGY, GYMNOSPERMS AND PALEOBOTANY
(Each questions carry 2 points)

Course Outcome	Q. No	Question	Answer
CO1: Collect lower forms of plants like Bryophytes, Pteridophytes and Gymnosperms from their natural habitat (Remember).	1	Bryophytes are commonly in a)Soil b)Clay c)Humans d)Rocks	d
	2	Gymnosperms are adapted to ….. conditions a)Xerophytic b) Mesophytic c)Hydrophytic d) Epophytic	a
CO2: Document their microscopic as well as macroscopic features with proper illustration (Understand)	3	Plectostele was common in a)Pogonatum b)Pinus c)Lycopodium d)Equisetum	c
	4	Winged microspores are characteristic feature of a)Funaria b)Isoetes c)Gnetum d)Pinus	d
CO3: Compare morphological as well as anatomical similarities among them along with their fossil representations (Apply).	5	Vessels are found in a)Pinus b)Pentoxylon c)Auracaria d)Gnetum	d
	6	Polystelic condition was observed in a)Selaginella b)Lycopodium c)Psilotum d)Marselia	a
CO4: Understand the importance of extinct flora (Analyse)	7	Which one of the following species is not included under the 'Red List'? A. Vulnerable B. Endangered C. Endemic D. Extinct	c

	8	What is the main reason that many species are becoming endangered? A. Habitat Destruction B. Disease C. Natural Selection D. Acid rain	a
CO5: Evaluate the origin of land plants (Evaluate)	9	In situ conservation refers to (a) On site conservation (b) Off site conservation (c) Could be both (a) and (b) (d) None of the above	a
	10	More than 70 percent of all the recorded biotic components are (a) Animals (b) Plants (c) Human beings (d) None of the above	a
CO6: Economic and ecological potential of lower plant forms, importance of conservation (Create)	11	Which plant form can tolerate wild fires a)Bryophytes b)Pteridophytes c)Gymnosperms d)None of these	b
	12	Which of the following is an ecological indicator a)Selaginella b)Pinus c)Gnetum c)Pteris	a

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SEMESTER II BY010201

CELL BIOLOGY, GENETICS AND PLANT BREEDING -THEORY

(Each questions carry 2 points)

Course Outcome	Question number	Question	Answer
CO1: Understand the basics of a plant cell. **(Remember).**	1		
	2		
CO2: Understand cell interactions and cell signalling **(Understand)**	3		
	4		
CO3: Cell cycle and various concepts of genetics **(Apply)**	5		
	6		
CO4: Human genetics and Hardley Weinberg equilibrium **(Analyse)**	7		
	8		
C05: Plant breeding for improvement of crops **(Evaluate)**	9		
	10		
CO6: Production of hybrids **(Create)**	11		
	12		

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SEMESTER II BY010201 PLANT ANATOMY, DEVELOPMENTAL BIOLOGY AND HORTICULTURE-THEORY (Each questions carry 2 points)			
Course Outcome	Question number	Question	Answer
CO1: Understand the internal structure of evolved group of plants**.(Remember)**	1		
	2		
C02: Recognise the structure, development and differentiation of tissues **(Understand)**	3		
	4		
CO3: Application of the basic concepts and theories related to developmental of plants **(Apply)**	5		
	6		
CO4: Evaluate the applications of developmental biology to understand the basics responses of growth **(Analyse)**	7		
	8		
CO5: Evaluate the scope and importance, classification and commercial importance of horticultural plants **(Evaluate).**	9		
	10		
	11		

CO6: Application of commercial floriculture **(Create).**	12		

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SEMESTER II BY010203
PLANT PHYSIOLOGY AND BIOCHEMISTRY -THEORY
(Each questions carry 2 points)

Course Outcome	Question number	Question	Answer
CO1: Absorption and translocation system in plants **(Remember)**	1		
	2		
CO2: Know the action of plant hormones relate with plant life cycle **(Understand).**	3		
	4		
CO3: Key physiological requirements for photosynthesis **(Apply).**	5		
	6		
CO4: Metabolic pathways and Environmental effects on physiology **(Analyse)**	7		
	8		
CO5: The role of biomolecules in life of plants **(Evaluate)**	9		
	10		
CO6: Biomolecules of economic value **(Create).**	11		
	12		

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SEMESTER II BY010204
MOLECULAR BIOLOGY -THEORY
(Each questions carry 2 points)

Course Outcome	Question number	Question	Answer
CO1 : Structure and function of nucleic acids **(Remember).**	1		
	2		
CO2: Mechanism of DNA replication **(Understand)**	3		
	4		
CO3 : Mutations **(Apply).**	5		
	6		
CO4 : Gene expression and the role of transcription factors on gene regulation **(Analyse)**	7		
	8		
CO5 : Transposons and DNA Repair **(Evaluate)**	9		
	10		
CO6: Genetic code **(Create)**	11		
	12		

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SEMESTER II BY010206
PLANT PHYSIOLOGY, BIOCHEMISTRY AND MOLECULAR BIOLOGY
- PRACTICAL COURSE II
(Each questions carry 2 points)

Course Outcome	Question number	Question	Answer
CO1: Separation of pigments and assay of enzymes **(Remember).**	1		
	2		
CO2: Familiarity and working knowledge to Instruments **(Understand) .**	3		
	4		
CO3: Understanding genetic code **(Apply).**	5		
	6		
CO4: Working knowledge on reagents, solutions and their dilutions **(Analyse)**	7		
	8		
CO5: Estimation Biomolecules **(Evaluate)**	9		
	10		
CO6: Revealing the characteristics of Genetic code by problem solving method **(Create).**	11		
	12		

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SEMESTER II BY010205

PLANT ANATOMY, DEVELOPMENTAL BIOLOGY, HORTICULTURE, CELL BIOLOGY, GENETICS AND PLANT BREEDING- PRACTICAL COURSE I

(Each questions carry 2 points)

Course Outcome	Question number	Question	Answer
CO1: Anomalous anatomy in plants **(Remember)**	1		
	2		
CO2: Understand various types of stomata and nodal anatomy **(Understand)**	3		
	4		
CO3: Vegetative propagation techniques **(Apply)**	5		
	6		
CO4: Cell division- Mitosis and Meiosis **(Analyse).**	7		
	8		
CO5: Analyse linkage, crossing over and pedigree **(Evaluate)**	9		
	10		
CO6: In-vitro pollen germination and staining-techniques **(Create).**	11		
	12		

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SEMESTER III BY010301
RESEARCH METHODOLOGY, MICROTECHNIQUE, BIOSTATISTICS AND BIOPHYSICAL INSTRUMENTATION -THEORY
(Each questions carry 2 points)

Course Outcome	Question number	Question	Answer
CO1: Discuss the objectives, types and stages of Research **(Remember).**	1	In order to pursue the research, which of the following is priorly required? A. Developing a research design B. Formulating a research question C. Deciding about the data analysis procedure D. Formulating a research hypothesis	b
	2	How to judge the depth of any research? A. By research title B. By research duration C. By research objectives D. By total expenditure on research	c
CO2: How to prepare project proposal for funding **(Understand)**.	3	Questions in which only two alternatives are possible is called A. Multiple choice questions B. Dichotomous questions C. Open ended questions D. Structured questions	b
	4	Which of the following features are considered as critical in qualitative research? a.Collecting data with the help of standardized research tools. b.Design sampling with probability sample techniques. c.Collecting data with bottom-up empirical evidence. d.Gathering data with top-down schematic evidence.	c
CO3: Attain technical skills for instrumentation **(Apply).**	5	Which one is called non-probability sampling? A. Quota sampling B. Cluster sampling C. Systematic sampling D. Stratified random sampling	a
	6	What type of chart is useful for comparing values over categories? A. Pie Chart B. Column Chart C. Line Chart D. Dot Graph	b
CO4: Statistical analysis of data **(Analyse)**.	7	In order to pursue the research, which of the following is priorly required? a.Developing a research design	b

		b.Formulating a research question c.Deciding about the data analysis procedure d.Formulating a research hypothesis	
	8	What are the conditions in which Type-I error occurs? a.The null hypotheses get accepted even if it is false b.The null hypotheses get rejected even if it is true c.Both the null hypotheses as well as alternative hypotheses are rejected d.None of the above	b
CO5: Importance of pre-treatments and staining in anatomy **(Evaluate)**	9	Which of the following is not a preservative ? a.Formalin b.Water. c. Acetic acid d.Alcohol	b
	10	Which of the following a nuclear stain a.Acetocarmine b.Safranin c.Cotton blue d.Eosin	a
CO6: Research designs **(Create)**	11	What does the term 'longitudinal design' mean? A. A study completed far away from where the researcher lives. B. A study which is very long to read. C. A study with two contrasting cases. D. A study completed over a distinct period of time to map changes in social phenomena.	d
	12	The degree of freedom for paired t-test based on n pairs of observations is: A. 2n - 1 B. n - 2 C. 2(n - 1) D. n – 1	d

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SEMESTER III BY010302
BIOTECHNOLOGY, BIOINFORMATICS AND BIONANOTECHNOLOGY -THEORY
(Each questions carry 2 points)

Course Outcome	Question number	Question	Answer
CO1: Understand the basics of biotechnology in plant science. **(Remember)**	1	What initiates the replication in DNA? a) DNA ligase b) Origin of replication c) Termination sequences d) Histone proteins	b
	2	_____ is an autonomously replicating circular extra-chromosomal DNA. a) Bacteria b) Nitrogenous base c) RNA d) Plasmid	d
CO2: Familiarising the tools and techniques of bioprocessing, tissue culture and genetic engineering**(Understand).**	3	The techniques of _____ overcome the limitation of traditional hybridization procedures. a) immunology b) modern hybridization c) genetic engineering d) cell biology	c
	4	Restriction enzymes are _____ a) ligases b) sticky ends c) molecular scissors d) vectors	c
CO3: Standardise conditions for In-vitro regeneration of plant species **(Apply)**	5	Making multiple copies of the desired DNA template is called _____ a) cloning b) transferring c) r-DNA technology d) genetic engineering	a
	6	The Golden Rice variety is rich in (a) Vitamin C (b) B-carotene and ferritin (c) Biotin (d) Lysine	b
CO4: Design strategies for a genetically modified organism **(Analyse).**	7	Klenow fragment is derived from (a) DNA Ligase (b) DNA Pol-I (c) DNA Pol-II (d) Reverse Transcriptase	b
	8	Southern blotting is (a) Attachment of probes to DNA fragments (b) Transfer of DNA fragments from	b

		electrophoretic gel to a nitrocellulose sheet (c) Comparison of DNA fragments to two sources (d) Transfer of DNA fragments to electrophoretic gel from cellulose membrane	
CO5: Understand the concepts and techniques involved in recombinant DNA technology **(Evaluate).**	9	Bacteria protect themselves from viruses by fragmenting viral DNA with (a) Ligase (b) Endonuclease (c) Exonuclease (d) Gyrase	b
	10	ELISA is (a) Using radiolabelled second antibody (b) Usage of RBCs (c) Using complement-mediated cell lysis (d) Addition of substrate that is converted into a coloured end product	d
CO6: Biological technology databases **(Create)**	11	The vaccines prepared through recombinant DNA technology are (a) Third generation vaccines (b) First-generation vaccines (c) Second-generation vaccines (d) None	a
	12	Which bacterium is used in the production of insulin by genetic engineering? (a) Saccharomyces (b) Rhizobium (c) Escherichia (d) Mycobacterium	c

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SEMESTER III BY010303
ANGIOSPERM TAXONOMY, ECONOMIC BOTANY AND ETHNOBOTANY -THEORY
(Each questions carry 2 points)

Course Outcome	Question number	Question	Answer
CO1: Evolution of classification of Angiosperms (Remember).	1	Who wrote the book 'Species Plantarum a. Gaspard Bauhin b. Gamble c. Bentham and Hooker d. Carolus Linnaeus	d
	2	Bentham and Hooker's classification is a a. phylogenetic system of classification b. artificial system of classification c. natural system of classification d. sexual system of classification	c
CO2: ICBN rules and methods (Understand)	3	How many principles are there in ICBN for naming of plants a.4 b.5 c.6 d.7	c
	4	Mode of ending of class a.-ae b.-phyta c.-opsida d.-ales	c
CO3: Application of ICBN rules and use of terminology on plant description (Apply)	5	Advantages of using scientific name a.Avoid confusion concerning the names of plants. b.Scientific names of plants are expressed in Latin because it is a international language and was used by early scholars to express plant names. c.It breaks the language barrier for communication as because it is universal and very much unique d. All of these	d
	6	Angiosperm characteristic assigned in ICBN are a.Seeds are enclosed by the ovary b. Generally mesophytic, hydrophytic and xerophytic in nature c Double fertilization is present and Endosperms are triploid d.All of these	d

CO4: Valid names and Priority (Analyse)	7	Which article deals with Citation of Author's Name a.Article 45 b.Article 46 c.Article 47 d.Article 48	b
	8	Which of the following is a nomenclatural type a. Holotype b. Syntype c. Paratype d.All of these	d
CO5: Familiarising flora (Evaluate)	9	A plant possessing the following character "Leaves decussate, entire and interpetiolar stipules; flowers in cymes; corolla tubular to rotate, stamens alternating with corolla lobes, gynoecium two, syncarpous, inferior" it belongs to a.Annonaceae b.Solanaceae c.Rubiaceae d.Acanthaceae	c
	10	The following characters denote which family "Cymose inflorescence or verticellaster; corolla bilabiate; stamens 4, didynamous or 2; with or without 2 staminodes; G (2) superior, each with 2 erect ovules; gynobasic style, ovary quadrilocular by false septum" a.Acanthaceae b.Boraginaceae c.Lamiaceae d.Euphorbiaceae	c
CO6: Economic importance and value addition of plants (Create)	11	Which one is not included in fumitories and masticatories. a.Piper betel b.Nicotiana tabacum c. Diospyros melanoxylon d. Camellia sinensis	d
	12	Which one is a millet a.Rice b.Wheat c.Bajra d.All of these	c

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SEMESTER III BY010304
ENVIRONMENTAL SCIENCE -THEORY
(Each questions carry 2 points)

Course Outcome	Question number	Question	Answer
CO1:Concept of Ecosystem **(Remember)**	1	A group of people coexist within space and time and interact with each other is known as _____ a) Keystone species b) Community c) Guild d) Population	b
	2	Which of the following structure can be seen in the diminishing population? a) Upright b) Inverted c) Bell shaped d) Urn-shaped	d
CO2:Community and Population **(Understand)**	3	The collection of individuals which belongs to the same species when live together in a region is known as a) Keystone species b) Community c) Guild d) Population	d
	4	Name the term which defines the study of the characteristics and parameters of the population. a) Demography b) Population ecology c) Population density d) Mortality	a
CO3: Interactions among various biotic and abiotic system and its balance in existence **(Apply)**	5	What is the direction of flow of energy in an ecosystem? a. Unidirectional b. Bidirectional c. Multidirectional d. Cyclic	a
	6	Which among the following correctly described "Eutrophication"? a. Over fertilization leading to bloom of some water species b. Overfertilization that leads to death of the terrestrial plants c. Changes in climate that leads to over-production of Nitrogen and Phosphates d. All of above	a

CO4:Role of indexes in Ecosystem stability **(Analyse)**	7	Which of the following is TRUE for the stabilized ecosystem? a) P-R=1 b) P/R < 1 c) P/R > 1 d) P/R =1	d
	8	Which of the following is a diversity index? a) Upright index b) Inverted index c) Bell shaped index d) Simpson's index	d
CO5: Concept of biosphere, nutrient and energy cycles **(Evaluate)**	9	Which of the following atom most often limit the primary productivity of an ecosystem a.Carbon b.Nitrogen c.Sulphur d.Phosphorus	a
	10	The main nitrogen reservoir in biosphere is a.organism b.rocks c.atmosphere d.ocean	c
CO6 : Reducing the pollution load **(Create)**	11	Green Economy is led by? a. United Nations Environment Programme b. International Hydrological Organization c. Intergovernmental Panel for Climate Change d. European Union	a
	12	Contamination of drinking water with which of the following causes Blackfoot disease (BFD)? a. Nitrates b. Arsenic c. Mercury d. Cadmium	b

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SEMESTER III BY010305
RESEARCH METHODOLOGY, MICROTECHNIQUE, BIOSTATISTICS, BIOPHYSICS AND BIOTECHNOLOGY- PRACTICAL COURSE I
(Each questions carry 2 points)

Course Outcome	Question number	Question	Answer
CO1: Cataloguing and Review of literature **(Remember)**	1	Catalog is based on a.the author b.the subject c.the title d.All of these	d
	2	Which of the following factors make the compliance of research ethics difficult? a. Societal norms b. Respect for confidentiality c. Lack of Checks d. Self-check	c
CO2: Research paper, report and ethics **(Understand)**	3	In the capacity of a researcher, how can you solve the problems that exist in the society? a. Eradicate unethical people from the society. b. Request the research institute to form a body of members for solving the problems. c. Participate in the activities of a suitable NGO to help in fighting the problems. d. None of the above.	d
	4	General ethical principles are: a) Beneficence b) Justice c) Respect d) All of the above Copying the work of other authors in whole pieces is called as a. Self-plagiarism b. Indirect plagiarism c. Direct plagiarism d. Patch writing	d
CO3: Test of significance and error **(Apply)**	5	What is the major attribute of Correlation Analysis? a Association among variables b.Difference among variables c.Regression among variables d.Variations among variables	a

	6	A statement made about a population for testing purpose is called? a) Statistic b) Hypothesis c) Level of Significance d) Test-Statistic	b
CO4: Develop Skill and standardisation of microtechnique procedures for various plants **(Analyse)**	7	Name an azo dye a.Aniline blue b.Safranin c.Haematoxylin d.Orange G	a
	8	Sudan Black is used to visualise a.Protein b.Carbohydrate c.Aminoacid d.Lipid	d
CO5:Componants of medium for tissue culture and conditions **(Evaluate)**	9	Medium may be undefined when it contain a.Agar b.Sucrose c.Coconut water d.Hormones	c
	10	Silica gel is used in a.Column chromatography b.HPLC c.GLC d.Paper chromatography	a
CO6:The genomes archives and analysis **(Create)**	11	If the Critical region is evenly distributed then the test is referred as? a) Two tailed b) One tailed c) Three tailed d) Zero tailed	a
	12	The first significant DNA sequence to be obtained was that of _____ a) Lambda b) Plasmid c) Lactose d) Mammals	a

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SEMESTER III BY010306
ANGIOSPERM TAXONOMY, ECONOMIC BOTANY AND ENVIRONMENTAL SCIENCE-PRACTICAL COURSE II
(Each questions carry 2 points)

Course Outcome	Question number	Question	Answer
CO1: Field exploration and methods of identification **(Remember).**	1	The newly collected specimen which is used as a substitute, when the original type material is missing in a herbarium, is designated as a) Lectotype b) Holotype c) Neotype d) Isotype	c
	2	The fruit of Abelmoschus esculentus a) Loculisidal capsule b) Capsule c) Berry d) Hesperidium	a
CO2: Scientific illustration of plants and description in technical terms **(Understand)**	3	Gynoecium of solanaceae is a) Monocarpellary b) Bicarpellary apocarpous c) Bicarpellary syncarpous d) Polycarpellary syncarpous	c
	4	Which one possesses numerous ovules in its pistil a) Asteraceae b) Poaceae c) Solanoceae d) Both A and B	c
CO3: Use of Flora **(Apply)**	5	When two or more authors publish a new species or propose a new name, their names are linked using the epithet? a) In b) ex c) et d) emend	c
	6	A document containing a comprehensive account of a specific taxonomic group, generally a genus or family is a)Manual b)Flora c)Monograph d)Revision	c
CO4: Find similarity and status of family genus and species **(Analyse).**	7	Family Brassicaceae/cruciferae is characterized by a) Marginal placentation b) Parietal placentation c) Basal placentation d) Axile placentation	b

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	8	Odd sepal is anterior in family a) Solanaceae b) Asteraceae c) Brassicaceae d) Fabaceae	d
CO5: Plant products and Value addition **(Evaluate).**	9	Atropine is obtained from the plant a)Pacific yew b)Belladona c)Periwinkle d)Foxglove	b
	10	Nicotine is obtained from a plant belonging to a) Liliaceae b) Solanaceae c) Brassicaceae d) Asteraceae	b
CO6: Estimation of nature of pollution in abiotic components **(Create).**	11	Which of the following particles is called the particulate pollutants? (a) Ozone (b) Radon (c) Fly Ash (d) Ethylene	c
	12	The major photochemical smog is_____. (a) Hydrogen peroxide (b) Chlorofluorocarbon (c) Peroxyacetyl nitrate (d) All of the above	d

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SEMESTER IV BY810402
CLINICAL MICROBIOLOGY -THEORY
(Each questions carry 2 points)

Course Outcome	Question number	Question	Answer
CO1: Basics of Immune system **(Remember).**	1	Neutrophils, basophil, lymphocytes, eosinophil and monocytes are examples of _____. (a) Physical barrier (b) Cellular barriers (c) Cytokine barriers (d) Physiological barriers	b
	2	B-cells and T-cells are two types of cells involved in _____. (a) Innate Immunity (b) Active immunity (c) Passive immunity (d) Acquired immunity	d
CO2: Clinical uses of antigen and antibodies **(Understand).**	3	Which of the following feature makes antibodies attractive drug candidates? a) It being a glycoprotein b) Low target specificity c) Catalytic efficiency d) High target specificity	d
	4	Which of the following feature is not taken into consideration when an antibody is designed as a drug? a) Immunogenicity b) Affinity c) Stability d) Primary structure	d
CO3: Success of transplantation **(Apply)**	5	Cyclosporine act by a.inhibition of T cells b.inhibition of B cells c.inhibition of immune system d.inhibition of compliment system	a
	6	Compactibility of MHC protein can be tested by a.MHC matching b.MHC typing c.Tissue typing d.Blood HLA	c
CO4: Viral and bacterial diseases	7	Which of the following is a method to increase the half-lives of antibody fragments?	d

diagnosis and treatment **(Analyse)**		a) Improvement of CDC b) Acetylation c) Fragment annealing d) PEGylation	
	8	Antibiotics are used to treat infections by (a) Virus (b) Bacteria (c) All the microorganisms (d) None of the above	b
CO5: Use of antibiotics and antibiotic resistance **(Evaluate)**	9	What is meant by antibiotic resistance? (a) It means our body has become resistant to the antibiotic (b) It means the bacteria have developed antibiotic resistance (c) Both (a) and (b) (d) None of the above	b
	10	Which of the following species is used for producing streptomycin? (a) *S. ramosus* (b) *S. griseus* (c) *S. aureofaciens* (d) *S. griseoflavus*	b
CO6:Treatment protocol for various diseases **(Create)**	11	Which of the following is most suitable for the therapeutic use against pathogens or tumor cells? a) IgG3 b) IgG4 c) IgG2 d) IgG1	d
	12	Which of the following is not a class of immunoglobulins? a) IgA b) IgD c) IgE d) IgB	d

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SEMESTER IV BY810403
INDUSTRIAL MICROBIOLOGY -THEORY
(Each questions carry 2 points)

Course Outcome	Question number	Question	Answer
CO1: Isolation protocol for beneficial microbes **(Remember)**	1	The yield of the antibiotic depends upon _____. (a) Age of the inoculum (b) Only the pH of the medium (c) Composition of the medium (d) All of the above	d
	2	In *Penicillium chrysogenum*, the maximum antibiotic production occurs during the _____. (a) The second phase (b) The third phase (c) First phase (d) In all three phases	a
CO2: Mode of operation of various fermenters. **(Understand)**	3	Which of the following fermentation processes is used in the production of penicillin? (a) Aerobic fermentation followed by anaerobic fermentation (b) Anaerobic fermentation (c) Aerobic fermentation (d) Anaerobic fermentation followed by aerobic fermentation	c
	4	The type of fermentation observed in yeasts is_____ (a) acrylic fermentation (b) lactic acid fermentation (c) pyruvic fermentation (d) alcoholic fermentation	d
CO3: Development and utilization of industrially important products **(Apply).**	5	*Monascus purpureus* **is utilized in the production of** (a) citric acid (b) ethanol (c) statins (d) streptokinase	c

	6	Beer produced from a. Barley b.Grape c.Rice d.Orange	a
CO4:Scaleup processes **(Analyse)**	7	The high yield of chlortetracycline requires _____. (a) No aeration (b) Controlled aeration (c) Continuous aeration (d) Aeration which does not affect the yield	c
	8	Which of the following seeds are used for the inoculum preparation for the fermentation medium for penicillin? (a) Rice seeds (b) Corn seeds (c) Wheat seeds (d) Barley seeds	d
CO5:Product purification **(Evaluate)**	9	After the fermentation process, penicillin is recovered as (a) Penicillin (b) Sodium penicillin (c) Calcium penicillin (d) Potassium penicillin	d
	10	Which of the following events occurs during the third phase of growth of *Penicillium chrysogenum*? (a) Autolysis of the medium starts (b) Slight rise in pH due to liberation of ammonia (c) The concentration of antibiotic increases in the medium (d) All of the above	d
CO6: Revolution of fermentation industry **(Create)**	11	What is the oxidizing agent in fermentation? (a) NAD+ (b) oxygen (c) Co2 (d) None of these	a
	12	In lactic acid fermentation, the final electron acceptor is: (a) Lactic acid (b) Pyruvate (c) Oxygen (d) NAD	b


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SEMESTER IV BY810404
FOOD, AGRICULTURAL AND ENVIRONMENTAL MICROBIOLOGY- PRACTICAL
COURSE I
(Each questions carry 2 points)

Course Outcome	Question number	Question	Answer
CO1: Near to a microbe, caution and safety **(Remember)**	1	When examining coliform bacteria in foods, it is preferable to use_____. a.Mac Conkey broth b.Violet Red Bile agar c.Eosin Methylene blue agar d.All of the above	d
	2	What are the factors that contribute to microbial growth? a.pH b.Moisture c.Oxidation-Reduction Potential d.All of the above	d
CO2: Develop manual skills to study the behaviour of microorganisms **(Understand).**	3	At _____, the most spoilage bacteria grow. a.acidic pH b.neutral pH c.alkaline pH d.all of the above	b
	4	The ACC (aerobic colony count) is also known as_____. a.Total viable count (TVC) b.Aerobic plate count (APC) c.Standard plate count (SPC) d.All of the above	d
CO3: Isolation of microorganisms from different Sources **(Apply)**	5	In order to make blue cheese, which of the following microbes is used? a.Streptococcus thermophilus b.Lactobacillus bulgaricus c.Penicillium roqueforti d.Rhizopus stolonifer	c
	6	The main microorganism in yoghurt is _____. a.Streptococcus thermophilus b.Leuconostoc citrovorum c.Lactobacillus acidophilus d.Streptococcus lactis	a

CO4: Growth requirements and products from microbes **(Analyse).**	7	Enumeration of microorganisms refers to _____. a.Depending on the test, non-selective plating may be used. b.Spiral plating, pouring or spreading a food suspension onto suitably selective agar. c.Either A or B d.None of the above	c
	8	In yeast cells, what is the protein content range? a.69% b.12-15% c.20-40% d.40-50%	d
CO5: Estimation of mycorrihzal colonization in roots **(Evaluate)**	9	Mycorrhiza exhibits the phenomenon of (a) Parasitism (b) Symbiosis (c) Antagonism (d) Endemism	b
	10	Which one of the following is found frequently in VAM a.Glomus b.Pennicillium c.Cyanobacteria d.Physarum	a
CO6: Microbial assay **(Create)**	11	Which of the following is the most accurate method for microbial assay of antibiotics? a) Physical assay b) Chemical assay c) Biological assay d) Chemical and biological assay	b
	12	Which of the following antibiotic have a sparing effect on the B12 in the diet? a) Streptomycin b) Tetracycline c) Anthramycin d) Chloramphenicol	a

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SEMESTER IV BY810405
CLINICAL MICROBIOLOGY AND INDUSTRIAL MICROBIOLOGY- PRACTICAL COURSE II
(Each questions carry 2 points)

Course Outcome	Question number	Question	Answer
CO1: Understand the protocol for collection of clinical sample specimens for microbiological analysis **(Remember)**	1	On Collecting blood what is added to it a.sodium citrate b.potassium citrate c.sodium phosphate d.potassium phosphate	a
	2	Optmum temperature (^{0}C)of blood right after collecting it a.25 b.22 c.20 d.15	b
CO2:Familiarise Equipment/Cultures /Reagents/ Diagrams **(Understand)**	3	When a chemical splashes in the eye rinse for _____? a. 10 seconds b. 5 minutes c. 30 seconds d. 15 minutes	d
	4	Good work practices include, a. smelling and tasting chemicals b. not washing hands before and after lab c. confining long hair and loose clothing d. using damaged equipment and glassware.	c
CO3: Determine the blood group **(Apply)**	5	Which of the following blood group is considered a universal donor? a) A b) B c) AB d) O	d
	6	The antigens for ABO and Rh blood groups are present on _____ a) plasma b) white blood cells c) red blood cells d) platelets	c
CO4: Staining of bacteria **(Analyse)**	7	What is the correct order of staining reagents in Gram-Staining? a) Crystal violet, alcohol, iodine solution, safranin b) Crystal violet, iodine solution, alcohol, safranin c) Crystal violet, safranin, alcohol, iodine	b

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		solution d) Iodine solution, crystal violet, alcohol, safranin	
	8	Which bacteria appears purple-violet colour after staining? a) Gram-positive b) Gram-negative c) Both Gram-positive and Gram-negative d) Neither Gram-positive nor Gram-negative	a
CO5:Optimization of process parameters **(Evaluate)**	9	When more than five variables are to be accessed _____ design can be used. a) Stowe-Mayer b) Greasham-Inamine c) Bull-Hicks d) Plackett-Burman	d
	10	Which of the following is not the replacement in serum-free media? a) Insulin b) Albumin c) Antibody d) Transferrin	c
CO6: Lab scale synthesis **(Create)**	11	Which of the following provides a protective effect to animal cells? a) Hepes b) Pluronic F-28 c) β-mercaptoethanol d) Albumin	b
	12	Which of the following is downstream processing? a) Cell breakdown b) Media formulation c) Product recovery d) Product formation	c

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SEMESTER IV BY 010401
PROJECT AND VIVA
(Each questions carry 2 points)

Course Outcome	Question number	Question	Answer
CO1: Knowledge in the general field of Botany **(Remember)**	1	Who proposed binomial nomenclature ? **a.** Linnaeus b. Benthem and Hooker c. Mendel d. Whittaker	a
	2	Which of following is a C4 plant a.Rice b.Wheat c.Sugarcane d.Peanut	c
CO2: Assess the learning outcome **(Understand)**	3	Which of the following is correct with respect to RuBisCO a. Most abundant protein b. It can survive on its own without the need of the plant c. Molecular weight 490000dalton d. All of these	d
	4	According to Food and Agriculture Organization IPM is a practice of.. (a). Keeping pest level below Economic Threshold Level. (b). Keeping pest level below Economic Injury Level. (c). Keeping pest level below Damage Boundary Level. (d). Keeping pest level below Environment Economic Threshold Level.	b
CO3: Chance to demonstrate the verbal and oral skills **(Apply)**	5	Oral presentation of your project ensures a. fluency and speed b. adequate attention and immediate response c. speedy interaction and immediate response d. speed and attention	b
	6	While making slide the number of words limited to a maximum of ….per slide a.8 b.9 c.10 d.11	c
CO4: Understanding of the subject up to the level of PG.**(Analyse)**	7	Taxon is- a) A taxonomic unit b) A species c) A taxonomic group of any rank	c

		d)A genus	
	8	Binomials with identical genus name and specific epithet are called a)Homonym b)Tautonym c)Basionym d)Synonym	b
CO5: Proving the project work is original **(Evaluate)**	9	A Type 1 error occurs in a situation where: a. The null hypothesis is accepted when it is in fact true b. The null hypothesis is rejected when it is in fact false c. The null hypothesis is rejected when it is in fact true d. The null hypothesis is accepted when it is in fact false	b
	10	The 'reliability'of a measure refers to the researcher asking: a.Does it give consistent results? b.Does it measure what it is supposed to measure? c.Can the results be generalized? dDoes it have face reliability?	a
CO6: Significance and the application of findings **(Create)**	11	The project undertaken by you provide a) Novelty b) Creativity c) Support d) Description	a
	12	In preparing for a viva or similar oral examination, it is best if you have: a.Avoided citing the examiner in your report b.Made exaggerated claims on the basis of your data c.Published and referenced your own article(s) d.Tried to memorize your work	c

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SEMESTER IV BY810401
FOOD, AGRICULTURAL AND ENVIRONMENTAL MICROBIOLOGY -THEORY
(Each questions carry 2 points)

Course Outcome	Question number	Question	Answer
CO1: Role of microbes in food industry and agriculture **(Remember).**	1	Which of the following is the standard resource for identifying bacteria? a.*Systema Naturae* b.Bergey's *Manual of Determinative Bacteriology* c.Woese and Fox's phylogenetic tree d.Haeckel's *General Morphology of Organisms*	b
	2	Which of the following are produced by microorganisms? a) Alcoholic beverages b) Fermented dairy products c) Breads d) All of the mentioned	d
CO2: Apply the potential of microbes to improve health and quality life **(Understand)**	3	Which of the following enzyme removes the RNA primer with its 5'-nuclease activity? a) DNA polymerase III b) RNA polymerase c) DNA polymerase I d) DNA polymerase II	c
	4	Which of the following inhibits DNA replication? a) x-rays b) gamma rays c) UV light d) cathode rays	c
CO3: Microbes as biofertilizers and biopesticides **(Apply)**	5	Which of the following is not a free-living Nitrogen-fixing bacteria? a) *Azotobacter* b) *Clostridium* c) *Klebsiella* d) *Xanthomonas*	d
	6	Which of the following is an aerobic nitrogen-fixing bacterium? a) *Azotobacter* b) *Clostridium* c) *Rhodospirillum* d) *Rhodopseudomonas*	a
CO4: Microbial diversity and culture **(Analyse)**	7	Growth of bacteria or microorganisms refer to _____ a) changes in the total population b) an increase in number of cells	b

		c) an increase in the size of an individual organism d) an increase in the mass of an individual organism	
	8	Which of the following method can be used to determine the number of bacteria quantitatively? a) Spread-plate b) Streak-plate c) Pour-plate and spread plate d) Pour plate	c
CO5: Bioremediation **(Evaluate)**	9	Bioaugmentation involves _____ A) eliminating sludge B) plants usage for bioremediation C) addition of microbes to a cleanup site D) bioventing	c
	10	In-situ based bio remediation involves introducing _____ to contaminated areas. A) Oxygen and nutrients B) Carbon dioxide and methane C) Nitrogen and CO2 D) CO and methane	d
CO6: Use of microbes in waste disposal **(Create)**	11	Ananda Chakraborty received the first U.S. patent for a GM entity. The entity was _____ A) The GloFish B) a transgenic mouse expressing the growth hormone gene C) Cloned E.Coli D) Pseudomonas engineered to degrade petroleum	d
	12	During which stage of wastewater treatment are methanogenic microbes most important? A)Primary treatment B)Sludge digestion C)Biological oxidation D)Secondary treatment	b