SLR- RK- 481

Seat No.	

M.Sc. (Genetics) (Semester II) (New) (CBCS) Examination, 2017

REGULATION OF GENE EXPRESSION AND DEVELOPMENTAL GENETICS

Day & Date: Wednesday,19-04-2017 **Marks: 70**

Time: 10.30 AM to 1.00 PM

N.B. : *1) **Section-I** is compulsory.*
*2) From **Section-II** attempt any **four**.*
*3) All **questions** carry **equal** marks.*
*4) Figures to **right** indicate **full** marks.*
*5) Draw **neat** and labeled **diagrams**.*

SECTION I

Q.1 A) Rewrite the following sentences by using correct alternatives: **07**

1) The site on DNA where a repressor binds called an _____.
   a) Lariate b) Activator c) Promoter d) Operator

2) Lac z gene encodes the enzyme _____.
   a) α galactosidase b) β galactosidase
   c) β- protease d) α lipase

3) In embryonic development the process of formation of blastocoel remarked by stage _____.
   a) blastula b) gastrula c) tetrad d) morula

4) In plants one of male gamete fuse with the egg or oosphere To form diplod zygote this is called _____.
   a) progamy b) syngamy c) acrogamy d) siphonogamy

5) In Drosophila _____ expressed in seven distinct bands along the anterior-posterior axis, in effect divide embryo into 15 segments.
   a) gap genes b) pair rule genes
   c) p53 genes d) Toll genes

6) The promoter of araBAD operon from E.coli is activated in the presence of _____.
   a) insulin b) triose c) DNA d) arabinose

7) In RNA splicing introns are removed and
   a) exons remain b) exons are also removed
   c) gene amplifies d) gene cloning takes place

B) Answer the following terms. **07**

1) Blastulation
2) Sipohnogamy
3) RNA editing
4) Diffentiation
5) Fertilization
6) Root apical meristem
7) Regulatory proteins

SECTION II

Attempt any four:

Q.2 Explain organization and regulation of *lac* operon. **14**

Q.3 Explain embryo sac formation and double fertilization in plants. **14**

Q.4 Explain ABC model of flower patterning in Arabidopsis. **14**

Q.5 Answer any two of the following: **14**

1) Explain concept of Vulva formation in *C.elegans.*
2) Explain heat shock gene expression
3) Discuss galactose utilization in yeast.

Q.6 Answer any two of the following: **14**

1) Explain double fertilization in plants.
2) Mechanism of lens induction in vertebrates
3) Describe process of gastrulation in chick

Seat No.	

M.Sc. (Genetics) (Semester – II) (New) (CBCS) Examination, 2017
Concept Of Biochemistry (HCT 2.2)

Day & Date: Friday, 21-04-2017 Max. Marks: 70

Time: 10.30 AM to 01.00 PM

N.B. : *1) Section-I compulsory.*
*2) Attempt **any four** from Section-II*

Section - I

Q.1 A) Rewrite the sentence after choosing the correct answer from the given alternatives. **07**

1) PFK – 2 converts fructose 6 phosphate to _____

a) Glucose 6 phosphate
b) Fructose 1, 6 bisphosphate
b) Fructose 1 phosphate
d) Fructose 2, 6 bisphosphate

2) The final product formed in glycolysis is ____acid.
a) acitic b) carboxylic c) lactic d) pyruvic.

3) _____Vitamin acts as coenzyme in carboxylation of acetyl co-A into malonyl co-A.
a) Biotin b) Folic acid c) Niacin d) Ascorbic acid

4) _____is an example of basic amino acid.
a) Glycine b) Lysine c) Alanine d) Valine

5) DNA has _____charge on it.
a) Positive b) negative c) no net charge d) neutral

6) Primary structure of proteins involves ____type of bond.
a) Peptide b) Hydrogen c) Disulfide d) glycosidic

7) Disorders or randomness of system is known as _____
a) Free energy
b) Free energy change
c) Enthalpy
d) Entropy

B) Definitions. **07**

1) Nucleotide
2) Carbohydrate
3) Metabolism
4) Photosynthesis
5) Vitamins
6) Transamination
7) Enzymes

Section - II

Q.2 Explain Light and dark reaction of photosynthesis. **14**

Q.3 Write a note on Michaelis - menten equation. **14**

Q.4 Discuss in detail oxidative phosphorylation. **14**

Q.5 **Answer any two from the following.** **14**

1) Explain in detail classification of vitamins.
2) Describe in detail redox potential.
3) discuss in brief Urea cycle.

Q.6 **Write short notes on (any two)** **14**

1) Biological oxidation reduction reaction.
2) Classification of lipids.
3) TCA

SLR- RK- 483

Seat No.	

M.Sc. (Genetics) (Semester II) (New) (CBCS) Examination, 2017

ADVANCE MICROBIAL GENETICS

Day & Date: Monday, 24-04-2017 **Marks: 70**

Time: 10.30 AM to 01.00 PM

Instructions: *1)* ***Section-I*** *is* ***compulsory****.*
2) From ***Section-II*** *attempt* ***any four****.*
3) ***All*** *questions carry* ***equal*** *marks.*
4) Figures to ***right*** *indicate* ***full*** *marks.*
5) Draw ***neat*** *and labeled* ***diagrams****.*

Q.1 A) Rewrite the following sentences by using correct alternatives: **07**

1) _____ method of gene transfer involves direct contact between the bacteria.
   a) Transformation b) Conjugation
   c) Transduction d) Transition

2) The process of self-fertilization in fungi is known as _____.
   a) Automixis b) Amphimixis
   c) Spermatization d) Somatogamy

3) Specialized Tranduction is mediated by _____.
   a) Lytic phages b) Lysogenic phages
   c) Bacteria d) T4 phages

4) _____ yeast strains can switch mating type.
   a) Homothallic b) Heterothallic
   c) Homozygous d) Heterozygous

5) If the F factor is attached to the bacterial genome the donor Is called as _____.
   a) F+ Strains b) F+ superstrains
   c) F++Strains d) Hfr strains

6) For inducing competency in a bacteria artificially _____ chemical is used.
   a) $CaCl_2$ b) $BaCl_2$ c) $NaCl_2$ d) Na_2HPO_4

7) Griffith used _____ organism for his studies on Transformation.
   a) *E.coli* b) *Bacillus subtilis*
   c) *Streptococcus peumoniae* d) *Hemophiliusinflueazae*

B) Answer the following terms. **07**

1) Transformation
2) Mutation
3) Prophage
4) Temporal mapping
5) Competancy
6) Autotrophs
7) Hfr

SECTION II

Attempt any four:

Q.2 Explain Griffith experiment and add a note on transformation. **14**

Q.3 Describe in detail various phases of fungal life cycle. **14**

Q.4 Write a note on conjugation and interrupted matting. **14**

Q.5 Answer any two of the following: **14**

1) Explain methods of artificial introduction of competency
2) Give an account on map of f plasmid.
3) Life cycle of virulent phages.

Q.6 Answer any two of the following: **14**

1) Mechanism of chromosome transfer in bacteria.
2) Explain fluctuation test.
3) Explain transduction.

SLR-RK – 484

Seat No.	

M.Sc. (Genetics) (Semester – II) (CBCS) (New) Examination, 2017
Industrial And Environmental Biotechnology

Day & Date: Monday, 24-04-2017 Max. Marks: 70

Time: 10.30 AM to 01.00 PM

N.B. : *1) Section – I is compulsory.*
2) From Section – II attempt any four
3) All questions carry equal marks.
*4) Figures to the **right** indicate **full** marks.*
5) Draw neat and labeled diagrams.

SECTION - I

Q.1 A) Rewrite the following sentences by using correct alternative. **07**

1) Aeration in bioreactor is provided by ……
   A) Impellers B) Baffles
   C) Sparger D) All of these

2) During milk fermentation, lactose is converted to lactic acid through .
   A) Lactobacillus B) Streptococcus
   C) Lactococcus D) Streptobacillus

3) High Value of BOD (Biochemical Oxygen Demand) Shows…….
   A) Water is Normal B) Water is Highly Polluted
   C) Water is Less polluted D) None of these

4) All enzymes are made up of…….
   A) Proteins B) Carbohydrates
   C) Fats D) Amino acids

5) The provisions of environmental protection in the constitution were made under ……
   A) Article 5-A B) Article 21-B
   C) Article 27-B(h) D) Article 48-A and Article 51-A (g)

6) Bioremediation uses……...
   A) Microorganisms natural capacities to break materials down.
   B) Added oxygen, water, and nutrients to increase rates of degradation.
   C) Organisms such as *Pseudomonas* and *Bacillus*
   D) All of these

7) The process of converting environmental pollutants into harmless products by naturally occurring microbes is called……

A) Ex-situ Bioremediation
B) Intrinsic Bioremediation
C) Extrinsic Bioremediation
D) None of these

B) Answer the following terms : **07**

1) Bioreactor
2) Single Cell Protein
3) Cell disruption
4) Environmental protection
5) Bioindicators
6) Sustainable Development
7) Air Pollution

SECTION – II

Attempt any four :

Q.2 Define Fermentation and explain the various types of fermentation in details. **14**

Q.3 Give an account of industrial processes for production of chemicals. **14**

Q.4 Give an account on product recovery by using filtration. **14**

Q.5 Answer any two of the following : **14**

1) Describe steps involved in industrial production of acids
2) Describe Environmental Laws
3) Explain Non Conventional energy sources

Q.6 Answer any two of the following : **14**

1) Describe Media Sterilization.
2) Explain Solid Waste management.
3) Write a short of Metal Microbe interactions.

SLR- RK 489

Seat No.	

M.Sc. II(Semester III) (Old) (CGPA) Examination, 2017
GENETICS
Immunology

Day & Date: Tuesday, 18-04-2017 **Marks: 70**

Time: 02.30 PM to 5.00 PM

Instructions: *1) Section-I is compulsory.*
2) From Section-II attempt any four.
3) All questions carry equal marks.
4) Draw neat and labelled diagrams wherever necessary.

Q.1 A) Multiple choice questions **07**

1) Example of mucosa-associated lymphoid tissue is **_____.**
a) Thymus b) Peyer's patch c) Spleen d) Lymph node

2) A suitable organism for use in recombinant vaccines is **_____ virus.**
a) Influenza b) Vaccinia
c) Small pox d) Polio

3) **_____** autoantigen**.**
a) Eye lens protines b) hapten c) RBCs d) WBCs

4) Vit.B12 deficiency is observerd in **_____** autommune disease.
a) Pernicious anemia b) Phaconaphylaxis
c) Myasthenia gravis d) SLE

5) The transfer of graft from donor to recipient belonging to Different species is called **_____.**
a) Isograft b) Allograft c) Xenograft d) Autograft

6) The major function of class I MHC is presentation of Peptide-antigen to **_____** cells.
a) T_H b) T_C c) T_S d) B

7) Fluorescein isothiocyanate or Lissamine rhodamine are Used in **_____.**
a) Radioimmuno assay b) Immuno-fluorescene
c) ELISA d) Complement fixation

B) Define the following terms. **07**

1) Apoptosis
2) Active immunity
3) Allograft
4) Vaccine
5) Antigenicity
6) Graft
7) Phagocytosis

SECTION II

Q.2 Explain humoral immune response in detail **14**

Q.3 Explain the cytokine receptor with examples **14**

Q.4 Give an account on processing and presentation of exogenous antigen **14**

Q.5 Write Short notes on any TWO of the following **14**

1) Write an account on cells of immune system
2) Write in briefly on complement activation by 'C1q' complement.
3) Discuss galactose utilization in yeast.

Q.6 Answer any two of the following: **14**

1) Give the role of cytotoxic T cells in immunity
2) Write an essay on hybridoma technology for monoclonal antibody synthesis.
3) Describe organs of immune system

Q.7 Write Short notes on any TWO of the following **14**

1) Describe organ specific autoimmune diseases with specific examples.
2) Describe Immunoelectophoresis
3) Explain various Types of transplants.

SLR- RK 502

Seat No.	

M.Sc.(Genetic)(Semester IV) (New) (CBCS) Examination, 2017
GENETIC ENGINEERING

Day & Date: Wednesday, 19-04-2017 **Marks: 70**

Time: 2.30 PM to 5.00 PM

Instructions: *1)* ***Section-I*** *is compulsory.*
2) From ***Section-II*** *attempt* ***any*** *four.*
3) All ***questions*** *carry* ***equal*** *marks.*
4) ***Figures*** *to right indicate* ***full*** *marks.*

SECTION I

Q.1 A) Rewrite the following sentences by using correct alternative: **07**

1) Which of the following is not required for a PCR reaction.
   a) Dideoxy-dNTPS b) Primer
   c) Template DNA d) A thermostable DNA polymerase

2) The vectors commonly used for sequencing of human genome _____
   a) Yeast artificial chromosome (YAC) b) Plasmid
   c) CMV vectors d) M13 vectors

3) The variation in the restriction DNA fragment lengths between individuals of species is called as _____**.**
   a) AFLP b) RAPD c) RFLP d) SSR

4) Tag polymerase is used in PCR because of its _____**.**
   a) low thermal stability b) high thermal stability
   c) high speed d) slow speed

5) The virus commonly used to infect cell culture for the production Of interferon is _____**.**
   a) corona virus b) Sendai virus
   c) small pox virus d) Polio virus

6) The uptake of plasmid DNA into bacterial cell is facilited in the presence of _____**.**
   a) Calcium Chloride b) Crystal bromide
   c) crystal violet d) Fulgen

7) Guanine specific cleavage in Maxum-Gilbert method is done by using _____
   a) Formic acid b) Hydrazine
   c) Dimethyl Sulphate d) Diethyl Phosphate

B) Answer the following terms. **07**

1) Define plasmid
2) Electroporation
3) What are restriction enzymes?
4) What is Cloning?
5) What is PCR?
6) DNA probes
7) What is Genetic engineering?

SECTION II

Attempt any four:

Q.2 Describe in deatail different steps involved in PCR reaction? **14**

Q.3 What is gene transfer? Describe any two method of gene transfer. **14**

Q.4 Describe Maxim's and Gilbert's method of DNA sequencing. **14**

Q.5 Answer any two of the following: **14**

1) Write note on RFLP & its application.
2) Discuss Agrobacterium is considered as Natural Genetic engineer of plant.
3) Discuss production of recombinant insulin

Q.6 Answer any two of the following: **14**

1) Write account on restriction endonuclease
2) Describe in short YAC
3) Write note on herbicide resistance plant

Seat No.	

M.Sc. Genetics (Semester – IV) (New) (CBCS) Examination, 2017
MOLECULAR MEDICINE

Day & Date: Friday, 21-04-2017 Max. Marks: 70

Time: 02.30 PM to 05.00 PM

N.B. : *1)* ***Section-I*** *compulsory.*
2) Attempt ***any four*** *from Section-II*
3) All question ***carry*** *equal* ***marks****.*
4) Draw neat and labeled ***diagrams*** *wherever* ***necessary****.*

Section – I

Q.1 A) Rewrite the sentence after choosing the correct answer from the given alternatives. **07**

1) Mutation in BTK gene leads to condition known as _____
   a) Phenylketonuria b) Haemoglobinopathies
   b) Agammaglobulinemia d) Marfan syndrome

2) _____is defined as compouned that demonstrates the desired biological activity on molecular target.
   a) Lead b) Genome c) mercury d) iron

3) _____is X linked recessive disease.
   a) DMD b) CFTR c) BTK b) Marfan

4) Stem cell exhibits ____ properties.
   a) Only potency b) Potency and self renewable
   c) Potency and non renewable d) Only self –renewable

5) Sickle cell anemia is caused due to replacement of _____ with amino acid Valine.
   a) Serine b) glutamic acid c) isolusine d) arginine

6) Hematopoietic stem cells are _____
   a) Pluripotent b) Totipotent c) Unipotent d) oligopotent

7) PAH gene is mutated in _____
   a) Phenylketoneuria b) Chagas disease
   c) Alzheimer's d) Cystic fibrosis

B) Definitions. **07**

1) Totipotency
2) Recombination
3) Microarray
4) Lead optimization
5) Magic bullets

6) Down's syndrome
7) Functional cloning

Section – II

Answer any four of the following.

Q.2 Define absorption explain in details factor affecting absorption and add a note on pharamacogenetics. **14**

Q.3 Explain in detail process of gene transfer by viruses and other methods. **14**

Q.4 Explain in brief properties, types and applications of adult stem cells. **14**

Q.5 Answer any two from the following. **14**

1) Write a note on induced pluripotent stem cells.
2) Explain in brief agammaglobelinemia.
3) Describe in detail route of administration of drugs.

Q.6 Write short notes on (any two) **14**

1) Give an account on Huntingtin gene mutation.
2) Explain in brief human genome project
3) Write a note on Parkinson's disease.

SLR-RK 504

Seat No.	

M.Sc. (Genetics)(Semester IV) (New) (CBCS) Examination, 2017
Agriculture Science & Seeds Technology (Paper XV)

Day & Date: Monday,24-04-2017 Max Marks: 70

Time: 02.30 PM to 05.00 PM

Instructions: *1) All questions of* ***section I*** *are compulsory.*
2) Answer any ***Four questions*** *from* ***section II***
3) All questions are equal marks.
4) Draw neat and labeled diagrams whether necessary

Section - I

Q.1 A) Rewrite the sentence after choosing the correct answer from the given **07**

1) The Redness of red soil is due to **_____.**
   a) Only aluminium b) Magnesium
   c) Only iron d) Sesquioxides

2) **_____**are minute openings distributed in the epidermis of the leaves and young stems.
   a) Guard cells b) Stomata c) Lenticel d) Cuticle

3) Hormone **_____** is synthesized by Shoot of the plant and migrates toward root.
   a) Auxin b) ABA c) Cytokinine d) Gibberllin

4) Loss of water in the form of liquid from uninjured margins of the leaves is called.
   a) Transpiration b) Guttation c) Imbibition d) Osmosis

5) **_____** plants can grow in desert soil.
   a) Algae b) Bryophytic c) Xerophytic d) Teridophytic

6) **_____**algae used in preparation of Biofertilizers.
   a) Blue-green b) Red c) Brown d) Green

7) The soil in Brahmaputra Valley is - **_____**type.
   a) Black b) Entisols c) Alluvial d) Red

B) Define the terms **07**

1) Seed germiniation
2) Imbibition
3) Transpiration
4) Vermicompost
5) Moisture stress
6) Cattle farming
7) Seed certification

Section II

Answer any four of the following

Q.2 Write on: Mineral deficiencies and their symptoms **14**

Q.3 Explain: Chemical, physical and microbiological properties of soil **14**

Q.4 Write in detail account of Biofertilizers. **14**

Q.5 **Answer any two from the following** **14**

A) Write a note on poultries farming.
B) Explain physiological and molecular responses of plants to temperature stress.
C) Explain importance of hormone Cytokinin.

Q.6 **Write short notes on (any two)** **14**

A) Add a note on : Importance of livestock in agriculture
B) Describe process of seed certification.
C) Explain Fruit ripening process and its control

Seat No.	

M.Sc. (Genetics) (Semester-IV)(New) (CBCS) Examination, 2017
INDUSTRIAL BIOTECHNOLOGY AND INTELLECTUAL PROPERTY RIGHTS

Day & Date: Wednesday, 26-04-2017 Max. Marks: 70

Time: 02.30 PM to 05.00 PM

N.B. : *1) All question of **Section I** are **compulsory**.*
*2) Answer **any four** questions from **section II**.*
3) All questions carry equal marks.
4) Draw neat and labeled diagrams wherever necessary.

SECTION – I

Q.1 A) Rewrite the sentence after choosing the correct answer from the given. **07**

1) The first true large sac aerobic fermenters were used in _____ in the 1930s for production of compressed year.
   a) USA b) UK
   c) Central Europe d) Japan

2) _____ centrifuge are useful for separating mould mycelia or crystalline compounds.
   a) Tangenical b) Basket
   c) Tubular-bowl d) Continuous flow

3) ____ fermenter is used for gaseous carbon source.
   a) Bubble cap b) Airlift
   c) Horizontal d) Tower

4) Minimum permissible standards of COD is water is ___ ppm.
   a) 200 b) 50
   c) 10 d) 35

5) The metabolic pathway involved in citric acid biosynthesis are the ____ Pathway and the TCA pathway.
   a) HMP b) EMP c) ED d) Glycolysis

6) For VitB_{12} bioassay ____ organism is used
   a) *E.Coli*157 b) *E.coli*113D
   c) EPEC d) S.aureus

7) _____ are patentable.
   a) Medicinal plants b) Biodiversity plants
   c) Genetic modified crops d) Seasonal crops

B) State True of False **07**

1) BOD
2) Batch fermentation
3) Physical Cell disruption
4) Patent
5) Phytoremdiation
6) Bioaugmentation
7) Upstream process

SECTION – II

Answer any four of the following

Q.2 Explain in detail – the ideal characters of fermenter. **14**

Q.3 Give an account on purification of fermentation products by chromatography and ultra filtration. **14**

Q.4 Give an account on treatment and disposal of industrial effluent. **14**

Q.5 Answer any two of the following **14**

A) Write short note on chemical toxicants of industry
B) Write short note on energy crisis
C) Write short note on citric acid fermentation

Q.6 Answer any two of the following **14**

A) Write short note on Patenting procedure in India
B) Discuss Phytoremdiation
C) Discuss Plant Breeder's Rights

SLR-RK – 506

Seat No.	

M.SC. Genetics (Semester – IV) (New) (CBCS) Examination, 2017
ANIMAL CELL CULTURE

Day & Date: Wednesday, 26-04-2017 Max. Marks: 70

Time: 02.30 PM to 05.00 PM

Instructions : *1) Section-I is **compulsory.***
*2) From **Section –II** attempt any four.*
*3) All questions **carry** equal **marks**.*
*4) Figures to **right** indicate full **marks**.*
*5) Draw neat and labeled **diagrams** wherever **necessary**.*

Q.1 A) Rewrite the following sentence by using correct alternative. **07**

1) HeLa cell line is derived from _____ cell line.
   a) Stomach b) Cervical c) Lung d) Blood

2) Which of the following behavior not shown by normal cell in culture?
   a) Contact inhibition b) Monolayer formation
   c) Uncontrolled cell division d) Anchorage dependent

3) Hybridoma technique used for monoclonal antibodies discovered by _____.
   a) Milstein b) Harrison c) Carrel d) Skoog

4) Isolation of lymphocyte from blood is carried out by using _____.
   a) PBS b) Ficol Hypaque c) EMEM d) BSS

5) Laminar air flow platform sterilized by using.
   a) 70% ethanol b) 100% ethanol
   c) 50% ethanol d) 30% ethanol

6) _____ chemical method used to get all the cells in same phase of growth in culture.
   a) Electrophoresis b) Metabolic Inhibitor
   c) GLC d) Centrifugation

7) _____ is indirect method of cell monitoring.
   a) Protein estimation b) Hemocytometry
   c) Coulter counter d) Viability count

B) Answer the following terms: **07**

1) Define serum.
2) Describe in brief laminar air flow.
3) Explain in brief karyotyping.
4) Write a note on Sterilization of Glasswares.
5) Explain in brief animal cell line.
6) Define Senescence.
7) Explain in brief cell repositories.

SECTION-II

Q.2 Describe physiological properties of media. **14**

Q.3 Give details of applications of animal cell culture. **14**

Q.4 Discuss in detail characteristics of culture cells **14**

Q.5 Answer any TWO of the following : **14**

1) Describe sterilization practices in ACT
2) Write a note on identifications of specific cell lines.
3) Explain in brief BSS.

Q.6 Answer any TWO of the following: **14**

1) Write a note on morphology of culture cells.
2) Write a note on culture based vaccine.
3) Discuss instruments used in ATC