D-003-001621 Seat No. _____

B. Sc. (Sem. VI) (CBCS) Examination

April / May – 2015

Biotechnology

BT-601 : Principles of Biotechnology Applied to Plants & Animal

Faculty Code : 003
Subject Code : 001621

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

Instructions : (i) All questions are compulsory.

(ii) The right side figures indicate total marks of the question.

(iii) Draw the figure wherever necessary.

(iv) Multi Choice Questions have to be answered in answer sheet only.

1 Multiple choice questions : **20**

(1) Growth hormone producing apical dominance is

(A) Auxin (B) Gibberellin

(C) Ethylene (D) Cytokinin

(2) The phenomenon of the reversion of mature cells to the meristematic state leading to the formation of callus is known as

(A) Redifferentiation (B) Dedifferentiation

(C) Either (A) or (B) (D) None of these

(3) Disaggregation of cells can be achieved by

(A) Physical disruption

(B) Enzymatic digestion

(C) Treating with chelating agents

(D) All of the above

(4) The human fibroblast is a classic example of

(A) Stable primary cell lines

(B) Established cell lines

(C) Cell transformations

(D) None of these

(5) The ability of cells to take up DNA fragments from surrounding is called

(A) Transfection (B) Transduction

(C) Transformation (D) Conjugation

(6) Sometimes cell lines can be cultured for such a long time that they apparently develop the potential to be subcultured indefinitely in vitro. Such cells lines are called

(A) Established cell lines

(B) Primary cell lines

(C) Secondary cell lines

(D) Propagated cell lines

(7) Synthetic seed is produced by encapsulating somatic embryo with

(A) Sodium chloride (B) Sodium alginate

(C) Sodium acetate (D) Sodium nitrate

(8) Somaclonal variations are the ones

(A) Caused by mutagens

(B) Produced during tissue culture

(C) Caused by gamma rays

(D) Induced during sexual embryogeny

(9) To produce plants that are homozygous for all traits, the best choice is

(A) Cell suspension culture

(B) Callus culture

(C) Anther / pollen culture

(D) Plant organ culture

(10) The enzymes required to obtain wall-free / naked protoplasts are

(A) Cellulase and proteinase

(B) Cellulase and pectinase

(C) Cellulase and amylase

(D) Amylase and pectinase

(11) The unique feature of callus is

(A) It gives rise to cells only

(B) It can give rise to zygotic embryos

(C) It can give rise to root, shoot and embryoids

(D) It can give rise to flowers directly

(12) A plant called *Rauolfia serpentina* is under the threat to extinction. To save this plant, which technique is highly useful ?

(A) Genetic engineering

(B) DNA fingerprinting

(C) Hybridoma technology

(D) In vitro culture

(13) The cell line used for the production of polio vaccine was

(A) Primate kidney cell line

(B) CHO cell line

(C) Dog kidney cell line

(D) Mouse fibroblast cell line

(14) The production of complete animals from somatic cells of an animal is called

(A) Gene cloning (B) Animal cloning

(C) Cell cloning (D) All of these

(15) The virus commonly used to infect cell cultures for the production of interferon is

(A) Corona virus (B) Sendai virus

(C) Polio virus (D) Small pox virus

(16) Hybrid antibodies are

(A) Antibodies produced in cell cultures

(B) Antibodies designed using rDNA technology produced in cell cultures

(C) Antibodies produced in *in-vivo*

(D) Both (A) and (B)

(17) When dissolved oxygen is lower than the critical concentration, viable cell concentration declines because of

(A) Incomplete glutamine oxidation

(B) Increase in specific lactate production from glucose

(C) Both (A) and (B)

(D) Accumulation of ammonia

(18) Excess CO_2 suppresses cell growth and productivity by

(A) Inhibiting respiration

(B) Altering intracellular pH by diffusing across cell membrane

(C) Both (A) and (B)

(D) Altering pH of the medium

(19) Unlike the somatic cells of animals, plant cells can be grown in tissue culture and regenerate new plants

(A) Because each cell contains the entire genome

(B) Because plant cells can dedifferentiate and revert back to seeds

(C) Because plant cells are able to express genes that weren't previously expressed

(D) Both (A) and (B)

(20) The technique of organ culture may be divided on the basis of employing

(A) Solid medium

(B) Liquid medium

(C) Both (A) and (B)

(D) Semi-solid medium

2 (a) Write any three : **6**

(1) Define "Totipotency".

(2) What is callus ?

(3) Define "Cybrids".

(4) What do you mean by synthetic medium ?

(5) Enlist methods of transformation in animals.

(6) Define "Stem cell".

(b) Write any three : **9**

(1) What is floriculture ? Write about role of PTC in floriculture.

(2) Discuss role of hormones and other plant growth regulators in PTC.

(3) Explain *Agrobacterium* mediated gene transfer in plants.

(4) Discuss in detail primary explantation techniques for animal cell culture.

(5) Explain carrel flask culture in detail.

(6) Explain serum free medium with an example.

(c) Write any two : **10**

(1) Write a detailed note on secondary metabolite production in plants.

(2) What is somatic embryogenesis ? Explain in detail production of synthetic seeds.

(3) Explain chemical methods for plant transformation.

(4) Write a note on laboratory requirement for animal cell culture laboratory.

(5) Describe in detail enzymatic disaggregation of animal tissues.

3 (a) Write any three : **6**

(1) Write a note on cyto-differentiation.

(2) What are plantibodies ?

(3) Enlist components of plant tissue culture media.

(4) Explain non-vector mediated genetic transformation methods for plants.

(5) What do you mean by "Transgenic Animals" ? Give an example.

(6) Enlist commonly used cell lines.

(b) Write any three : **9**

(1) Write a note on bioreactors for cell culture techniques.

(2) What is edible vaccine ? Explain in detail.

(3) What is somaclonal variation ? Give its importance.

(4) Short note : Protoplast fusion.

(5) Explain retrovirus mediated gene transfer.

(6) Write a note on organ culture technique.

(c) Write any two : **10**

(1) Write a note on application of PTC and briefly discuss its importance.

(2) Explain haploid culture technique.

(3) Describe *in-vitro* fertilization in detail.

(4) What is cell line ? Explain with examples.

(5) Application of transgenic animals.
