NAM-003-001621 Seat No. _____

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

March / April - 2017

BT-601 : Biotechnology

(Principles of Biotechnology Applied to Plants & Animals) (New Course)

Faculty Code : 003
Subject Code : 001621

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

Instructions : (1) Question no. 1 is compulsory and carry equal marks.
(2) Answer the Section - I (Question 1) in one word or one line.

SECTION - I

1 All questions are compulsory and carry equal marks : **1×20**

(1) Define callus.

(2) Who is regarded as father of plant tissue culture?

(3) Which pathway of micropropagation ensure genetic truthfulness ?

(4) Name any two chemicals which can be used for sterilization of explant.

(5) Differentiate between protoplast and cytoplast.

(6) Which plant growth regulators are generally used to induce *in vitro* rooting during plant tissue culture?

(7) Write two differences in somatic embryo and gametic embryo.

(8) Write two disadvantages of chemical method of protoplast fusion.

(9) During culturing, at- which growth phase of cells, the maximum accumulation of secondary metabolites is observed.

(10) BT Cotton is mainly resistant against which insect? From which source organism this resistant gene was isolated?

(11) What do you understand by 'In Planta Transformation'.

(12) During culturing of animal cell, which concentration of CO_2 is recommended?

(13) Define 'Established Cell Line' in animal cell culture.

(14) What is the range of optimum glucose concentration in the animal tissue culture media?

(15) Write any two toxic effect of higher dissolved oxygen concentration in animal tissue culture medium.

(16) Which is the most commonly used protease to disaggregate the animal tissue?

(17) How the toxicity due to ammonia accumulation is overcame during animal cell culture?

(18) Name any two plant propagules which can be used as starting material to prepare synthetic seeds.

(19) Which vaccine was developed first of all through animal cell culture?

(20) What is the effect of excess accumulation of lactate and ammonium on animal cells during culture condition.

SECTION - II

2 (a) Answer any three questions out of following six : **2×3**

(i) Write the contribution of Shipra Guha Mukharjee and S. C. Maheshwari in development of plant tissue culture science.

(ii) Define explant with suitable example.

(iii) Mention the stages of micropropagation.

(iv) Mention only the main components of plant tissue culture medium.

(v) Write three differences between natural and synthetic animal tissue culture medium.

(vi) Define cell line. Write two attributes of cell lines with examples.

(b) Answer any three questions out of following six : **3×3**

(i) Write any three landmark discoveries in the history of plant tissue culture

(ii) What do you understand by hardening and acclimatization in plant tissue culture? Write its two importance.

(iii) Write the three important role of auxins in plant tissue Culture.

(iv) Write three difference between diploid and transformed cell line.

(v) Discuss any two visual Markers with examples, which can be used to select the true hybrid from the population of fused and unfused protoplast.

(vi) Discuss any three methods of tissue disaggregation.

(c) Answer any two questions out of given five : **5×2**

(i) Draw the labeled schematic diagram of Ti plasmid of Agrobacterium and mention the role of its various coding sequence.

(ii) Write the factors which affect the protoplast isolation. Discuss the enzymatic method of protoplast isolation.

(iii) What do you understand by incineration? How explant sterilization is done in plant tissue culture?

(iv) What do you understand by *in vitro* fertilization? Give the details of methodology of in *vitro* fertilization.

(v) Give a detailed account of biological method of transformation in animal cell.

3 (a) Answer any three questions out of following six : **2×3**

(i) What do you mean by clean area in tissue culture lab?

(ii) What is the full form of HEPA filters? Write the pore size and role of HEPA filters.

(iii) Name at least three macronutrient which are added in plant tissue Culture medium. What : effect will be caused by deficiency of manganese in plant culture medium?

(iv) What is the role of cytokinins in plant tissue culture?

(v) Write two landmark discoveries in the history of animal cell culture.

(vi) What do you understand by BSS in animal cell culture medium? Write the role of BSS in cell culture.

(b) Answer any three questions out of following six : **3×3**

(i) Write short note on somatic embryogenesis.

(ii) Explain biotransformation in reference to secondary metabolite production with suitable example.

(iii) Define elicitors. How elicitation is different from biotransformation?

(iv) Write short note on microinjection. .

(v) Write three important applications of animal cell culture.

(vi) Write short note on 'edible vaccines'.

(c) Answer any two questions out of given five : **5×2**

(i) Describe and discuss lay-out plan for a large-sized plant tissue culture facility.

(ii) Give a detailed account of continuous cell line.

(iii) Describe in detail physical and chemical method of protoplast fusion.

(iv) Write the mains steps of transgenic plant development. Give an account of Bt cotton.

(v) Compare and contrast upon plant and animal tissue culture medium.
