**Write the following information in the first page of Answer Script before starting answer**

**ODD SEMESTER EXAMINATION: 2020-21**

Exam ID Number_____

Course_____ Semester_____

Paper Code_____Paper Title_____

Type of Exam: _____ (Regular/Back/Improvement)

***Important Instruction for students:***

1. Student should write objective and descriptive answer on plain white paper.
2. Give page number in each page starting from 1st page.
3. After completion of examination, Scan all pages, convert into a single PDF and upload to the Google classroom as attachment.
4. Exam timing from 10am – 1pm (for morning shift).
5. Question Paper will be uploaded before 10 mins from the schedule time.
6. Additional 20 mins time will be given for scanning and uploading the single PDF file.
7. Student will be marked as ABSENT if failed to upload the PDF answer script due to any reason.

# M. Sc. BIOTECHNOLOGY
# THIRD SEMESTER
# PLANT & ANIMAL BIOTECHNOLOGY
# MBT - 302

**Duration : 3 hrs.** **Full Marks : 70**

## PART-A: Objective

**Time : 20 min.** **Marks : 20**

***Choose the correct answer from the following:*** ***1 ×20=20***

**1.** Which of the following is the most commonly used carbon source?
**a.** Glucose **b.** Sucrose
**c.** Maltose **d.** Fructose

**2.** In plant tissue culture, which of the following shows totipotency?
**a.** Meristem **b.** Sieve cells
**c.** Xylem vessels **d.** Phloem

**3.** Out of the following, which one is the not the basic component of culture media used for plant tissue culture?
**a.** Complex mixture of salts **b.** Amino acids
**c.** Serum albumin **d.** Sucrose

**4.** Disarming of Ti plasmid means
**a.** removal of left and right border **b.** removal of vir genes
**c.** removal of T DNA **d.** none of the above

**5.** Ri plasmid cause the following disease in plants
**a.** hairy root disease **b.** crown gall disease
**c.** powdery mildew **d.** all of the above

**6.** A/n _____ is excised piece of leaf or stem used for micropropagation
**a.** Microshoot **b.** Explant
**c.** Scion **d.** None of the above

**7.** Embryo like structures formed from mass of callus is called
**a.** Somatic embryo **b.** Zygotic embryo
**c.** Dividing embryos **d.** All of the above

**8.** Batch cultures are a type of suspension culture where
**a.** Medium is continuously replaced
**b.** Medium is loaded only at the beginning
**c.** No depletion of medium occurs
**d.** Cellular wastes are continuously removed and replaced

**9.** In biolistic method, DNA sample is coated with
**a.** mercury particle **b.** manganese particle
**c.** both (a) and (b) **d.** gold particles

**10.** Which of the following is NOT a method of direct gene delivery?
**a.** *Agrobacterium* mediated **b.** electroporation
**c.** micro injection **d.** both (b) and (c)

**11.** *Bt.* Cotton transgenic plants are resistant against
**a.** viral disease **b.** insect
**c.** male sterility **d.** none of the above

**12.** Following are the advantages of animal cell culture
**a.** Control of physical parameters **b.** Control of cell passages
**c.** Control of physiological conditions **d.** All of the above

**13.** Following is not a future perspective of animal cell culture
**a.** cancer research **b.** vaccine production
**c.** growth of plants **d.** gene therapy

**14.** Which is NOT a cell culture growing medium or substrate in animal cell culture?
**a.** gold as substrate **b.** disposable plastic
**c.** glass as a substrate **d.** palladium as a substrate

**15.** Which are the methods used for disaggregation of cell culture in animal cell culture?
**a.** mechanical disaggregation **b.** enzymatic disaggregation
**c.** primary explanation technique **d.** all of the above

**16.** Haploids are produced in large number by
**a.** Anther culture **b.** Ovary culture
**c.** Embryo culture **d.** Both (a) and (b)

**17.** To obtain naked protoplast during somatic hybridization the enzymes needed are
**a.** Cellulase and pectinase **b.** Cellulase and amylase
**c.** Cellulase, pectinase and hemicellulase **d.** None of the above

**18.** The first report of forming hybrid embryos from Datura by invitro was published by
**a.** Nitch **b.** Maheshwari
**c.** Bourgin and Nitch **d.** Guha and Maheshwari

**19.** Which of the following is the main effect of cytokines in the tissue culture medium?
**a.** Induction of somatic embryos **b.** Shoot elongation
**c.** Adventitious shoot formation **d.** Root formation

**20.** Different culture techniques employed in protoplast culture is/are
**a.** Hanging droplet **b.** Liquid culture
**c.** Co-culture **d.** All of the above

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## PART-B : Descriptive

**Time : 2 hrs. 40 min.** **Marks : 50**

*[ Answer question no.1 & any four (4) from the rest ]*

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|---|---|---|
| **1.** | Write a note on media composition. What is clonal propagation? Explain meristem culture. | **4+1+5 =10** |
| **2.** | What are approaches of gene transfer in plants? Explain in brief about the organization of Ti plasmid. | **2+8=10** |
| **3.** | Define dedifferentiation and redifferentiation. Explain the method of indirect organogenesis. Write about somatic embryogenesis. | **2+4+4 =10** |
| **4.** | Write a note on insect resistant plants and transfer of male sterility into plants. | **5+5=10** |
| **5.** | define primary culture and stem cells. Write a note on types of stem cells. | **2+8=10** |
| **6.** | Write on the scope of animal biotechnology. What is the basic requirement for animal cell culture? | **3+7=10** |
| **7.** | What are haploids? Explain anther culture. Write in brief the methods used to increase the number of chromosomes in a haploid culture cell. What is the significance and uses of haploid plant production? | **1+3+3+3 =10** |
| **8.** | What is somatic hybridization? Explain the methods of protoplast fusion. What are the methods of identification of hybrids? What is importance of somatic hybridization? | **1+4+3+2 =10** |

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