

U.G. 5th Semester Examination-2020**Molecular Biology & Biotechnology****[HONOURS]****Discipline Specific Elective (DSE)****Course Code : MBBT-DSE-T-505****(Plant Biotechnology)**

Full Marks : 40

Time : 2½ Hours

*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.*

1. Answer any **five** of the following: $2 \times 5 = 10$
- a) Differentiate between somaclonal and gametoclonal variation.
 - b) What is embryo rescue?
 - c) Differentiate between cytodifferentiation and organogenic differentiation.
 - d) Name two popular media formulations used for plant tissue culture.
 - e) Why ammonium and potassium nitrate both are used in MS media?
 - f) Differentiate between somatic and zygotic embryogenesis.

- g) Why subculturing is necessary for routine maintenance of plant culture?
 - h) What is the difference between dedifferentiation and redifferentiation?
2. Answer any **two** of the following: $5 \times 2 = 10$
- a) What is somaclonal variation? Write down the applications and limitations of somaclonal variation. $2+3$
 - b) Mention two major objectives of protoplast fusion. How can you verify the hybridity after protoplast fusion (any one strategy)? What are the differences between symmetric and asymmetric hybrid? $2+2+1$
 - c) What is called explant? Name the different types of explants used in plant tissue culture. What is the difference between totipotency and pluripotency? $1+2+2$
 - d) Explain in details the various steps involved in micropropagation. 5
3. Answer any **two** of the following: $10 \times 2 = 20$
- a) Write down the various steps involved in somatic embryogenesis of any dicot plant. How polyploid plants can be produced using plant tissue culture technique and add a note on its

significance of it. What do you mean by epigenetic variation? 5+4+1

- b) How is organogenesis different from embryogenesis? Differentiate between direct and indirect organogenesis. State the importance of organogenic differentiation in tissue culture. Write down any two important methods of cell suspension culture. 2+2+2+4
- c) What is clonal propagation? How can you produce virus free plants by tissue culture process? What is haploid culture? Write down the significance of using haploid culture. What is depolarization? 2+3+1+3+1
- d) Write down the various kinds of sterilization techniques used in plant tissue culture. State the role of 70% alcohol in surface sterilization of explants. Write down the roles of plant growth regulators in tissue culture. Explain with example. Write down the effect pH in the plant growth medium. 3+2+3+2
- _____