

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
DEPARTMENT OF PLANT BIOLOGY
FIRST SEMESTER BTECH. EXAMINATION, 2019/2020 SESSION

COURSE CODE PLB 515
COURSE TITLE: CYTOGENETICS
COURSE UNIT: 3
TIME ALLOWED: 2 HOURS

INSTRUCTION: ANSWER ANY FOUR (4) QUESTIONS IN ALL

- 1a. With the aid of appropriate examples explain the mechanism involved in the evolution of new species from interspecific hybridization and polyploidy in a natural population.
- b. Write note on structural chromosomal aberrations
- 2 a. Explain the following modes of speciation; (i) Allopatric (ii) Sympatric (iii) Parapatric
- b. Succinctly write on forms of reproductive isolating mechanism
- 3 a *Triticale hexaploide* is a new wheat species obtained from a cross between rye (*Secale cereale*) $2n = 14$ (diploid) and tetraploid wheat (*Triticum turgidum*) $2n = 28$ (diploid).
- iii. Explain the mechanism involved in the evolution of the species.
- iv. Determine the chromosome number and the ploidy level if newly evolved species is backcrossed to *S. cereale*
- b. State the functions of pretreatment in cytological examination of chromosomes
- 4 a. Write in details on the following crop selection methods:
(i) Mass selection (ii) Pure line selection
- b. Highlight essential criteria of consideration for selecting good parents in hybridization programmes.
- 5 a. Discuss the essential steps involve in the study of plant somatic chromosomes.
- b. Explain succinctly, modern synthetic theory of evolution
- 6 a. In sequential order, explain the essential steps involved in artificial hybridization of pearl millet for yield improvement.
- b. Succinctly write on the following:
(i) Monoploid (ii) Nullisomy (iii) Trisomy (iv) Tetrasomy (v) Mitotic index