Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 07

M.Sc. Mathematics (2017 Batch) (Sem.–2)

ALGEBRA-II

Subject Code : MSM-201

Paper ID : [75008]

Time : 3 Hrs. Max. Marks : 80

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of EIGHT questions carrying TWO marks each.
2. SECTION - B & C. have THREE questions in each section carrying SIXTEEN marks each.
3. Select atleast TWO questions from SECTION - B & C EACH.

SECTION-A

Q1. Answer briefly :

a) Define UFD.

b) Prove that every field is principal ideal domain.

c) Use Eisenstein's criterion to prove that the following polynomials are irreducible over Q.

i) x^2+1

ii) x^2-3x+4

d) State Gauss lemma.

e) Show that no finite field is algebraically closed.

f) State Fundamental theorem of Algebra.

g) Discuss PID.

h) Find splitting fields of the polynomial x^4+x^2+1.

SECTION-B

Q2. Prove that Every Euclidean Domain is P.I.D.

Q3. State and prove Eisenstein's Criterion.

Q4. Prove that any finite extension of a finite field is a Galois extension.

SECTION-C

Q5. State and prove fundamental theorem of Galois Theory.

Q6. Prove that every finite separable extension is a simple extension.

Q7. Prove that a field is finite if and only if its multiplicative group is cyclic.