April – 2016

B.Sc. EXAMINATION: April-2016

SEMESTER-VI

RING THEORY

PAPER NO.:M-601

TIME:2:30 HOURS

CODE NO:4619

TOTAL MARKS:70

INSTRUCTIONS(1)ALL QUESTIONS ARE COMPULSORY.
(2)EACH QUESTION CARRY EQUAL MARKS.

Q.1	A	If R is Boolean ring then prove that R is commutative ring and also find characteristics of R.	07
	B	If R is the set of residue classes modulo 6 then Show that (R_7 , $+_7$, $\bullet_7$) is commutative ring.	07
		OR	
Q.1	A	Prove : Ring R is without zero divisor iff the cancelation laws hold in R.	07
	B	Define sub ring ,State and prove necessary and sufficient condition for nonempty subset S of ring R to be a sub ring of R.	07
Q.2	A	If M and N are ideals of ring R then M + N is ideal of ring R.	07
	B	If f is homomorphism of ring R into ring R' with kernel S then S is an ideal of R.	07
		OR	
Q.2	A	Every finite integral domain is a field.	07
	B	If P is prime in principal ideal domain D iff an ideal <P> is maximal ideal in D.	07
Q.3	A	State and prove fundamental theorem on homomorphism of ring.	07
	B	Prove that an ideal I of the ring R is maximal ideal iff I is generated by some prime integer.	07
		OR	
Q.3	A	If R is commutative ring , a $\in R$ and I = { $ax = 0$ / x $\in$ R } then I is an ideal of R.	07
	B	Prove that an ideal M of commutative ring R with unity is maximal ideal iff R/M field.	07
Q.4	A	Define UFD and prove that P is prime in PID iff <p> is maximal ideal in D.	07
	B	Prove that every PID is UFD.	07
		OR	
Q.4	A	State and prove Euler's generalization theorem.	07
	B	State and prove factor theorem.	07
Q.5	A	If $f(x) = x^4 - 3x^3 + 2x^2 + 4x - 1$ and $g(x) = x^2 - 2x + 3 \in Z_5[X]$ then find q(x) and r(x) such that f(x) = q(x)·g(x) + r(x).	07
	B	State and prove Eisenstein's criterion theorem.	07
		OR	
Q.5	A	State and prove division algorithm theorem.	07
	B	State and prove Euler theorem.	07