	pc_ctl	ext_ctl	rd_sel	cmp_ctl	pc_gen_ctl	fsm_dly	muxa_ctl	muxb_ctl	alu_func	alu_we	dmem_ctl	wb_we	wb_mux
SLL	PC_GEN	EXT_SA	RD_RD	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_EXT	MUXB_RT	ALU_SLL	EN	DMEM_NOP	EN	WB_ALU
SRL	PC_GEN	EXT_SA	RD_RD	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_EXT	MUXB_RT	ALU_SRL	EN	DMEM_NOP	EN	WB_ALU
SRA	PC_GEN	EXT_SA	RD_RD	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_EXT	MUXB_RT	ALU_SRA	EN	DMEM_NOP	EN	WB_ALU
JR	PC_GEN	EXT_NOP	RD_NOP	CMP_NOP	PC_JR	FSM_NOP	MUXA_NOP	MUXB_NOP	ALU_NOP	DIS	DMEM_NOP	DIS	WB_NOP
MFHI	PC_GEN	EXT_NOP	RD_RD	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_NOP	MUXB_NOP	ALU_MFHI	EN	DMEM_NOP	EN	WB_ALU
MFLO	PC_GEN	EXT_NOP	RD_RD	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_NOP	MUXB_NOP	ALU_MFLO	EN	DMEM_NOP	EN	WB_ALU
SUB	PC_GEN	EXT_NOP	RD_RD	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_RS	MUXB_RT	ALU_SUB	EN	DMEM_NOP	EN	WB_ALU
SUBU	PC_GEN	EXT_NOP	RD_RD	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_RS	MUXB_RT	ALU_SUBU	EN	DMEM_NOP	EN	WB_ALU
ADD	PC_GEN	EXT_NOP	RD_RD	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_RS	MUXB_RT	ALU_ADD	EN	DMEM_NOP	EN	WB_ALU
ADDU	PC_GEN	EXT_NOP	RD_RD	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_RS	MUXB_RT	ALU_ADD	EN	DMEM_NOP	EN	WB_ALU
AND	PC_GEN	EXT_NOP	RD_RD	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_RS	MUXB_RT	ALU_AND	EN	DMEM_NOP	EN	WB_ALU
MULT	PC_GEN	EXT_NOP	RD_NOP	CMP_NOP	PC_NEXT	FSM_MUL	MUXA_RS	MUXB_RT	ALU_MULT	DIS	DMEM_NOP	DIS	WB_NOP
MULTU	PC_GEN	EXT_NOP	RD_NOP	CMP_NOP	PC_NEXT	FSM_MUL	MUXA_RS	MUXB_RT	ALU_MULTU	DIS	DMEM_NOP	DIS	WB_NOP
NOR	PC_GEN	EXT_NOP	RD_RD	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_RS	MUXB_RT	ALU_NOR	EN	DMEM_NOP	EN	WB_ALU
OR	PC_GEN	EXT_NOP	RD_RD	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_RS	MUXB_RT	ALU_OR	EN	DMEM_NOP	EN	WB_ALU
SLT	PC_GEN	EXT_NOP	RD_RD	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_RS	MUXB_RT	ALU_SLT	EN	DMEM_NOP	EN	WB_ALU
SLTU	PC_GEN	EXT_NOP	RD_RD	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_RS	MUXB_RT	ALU_SLTU	EN	DMEM_NOP	EN	WB_ALU
XOR	PC_GEN	EXT_NOP	RD_RD	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_RS	MUXB_RT	ALU_XOR	EN	DMEM_NOP	EN	WB_ALU
DIV	PC_GEN	EXT_NOP	RD_NOP	CMP_NOP	PC_NEXT	FSM_MUL	MUXA_RS	MUXB_RT	ALU_DIV	DIS	DMEM_NOP	DIS	WB_NOP
DIVU	PC_GEN	EXT_NOP	RD_NOP	CMP_NOP	PC_NEXT	FSM_MUL	MUXA_RS	MUXB_RT	ALU_DIVU	DIS	DMEM_NOP	DIS	WB_NOP
BGEZ	PC_GEN	EXT_B	RD_NOP	CMP_BGEZ	PC_BC	FSM_CUR	MUXA_NOP	MUXB_NOP	ALU_NOP	DIS	DMEM_NOP	DIS	WB_NOP
BLTZ	PC_GEN	EXT_B	RD_NOP	CMP_BLTZ	PC_BC	FSM_CUR	MUXA_NOP	MUXB_NOP	ALU_NOP	DIS	DMEM_NOP	DIS	WB_NOP
ORI	PC_GEN	EXT_UNSIGN	RD_RT	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_RS	MUXB_EXT	ALU_OR	EN	DMEM_NOP	EN	WB_NOP
ADDI	PC_GEN	EXT_SIGN	RD_RT	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_RS	MUXB_EXT	ALU_ADD	EN	DMEM_NOP	EN	WB_ALU
ADDIU	PC_GEN	EXT_UNSIGN	RD_RT	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_RS	MUXB_EXT	ALU_ADD	EN	DMEM_NOP	EN	WB_ALU
ANDI	PC_GEN	EXT_UNSIGN	RD_RT	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_RS	MUXB_EXT	ALU_AND	EN	DMEM_NOP	EN	WB_ALU
BEQ	PC_GEN	EXT_B	RD_NOP	CMP_BEQ	PC_BC	FSM_CUR	MUXA_NOP	MUXB_NOP	ALU_NOP	DIS	DMEM_NOP	DIS	WB_NOP
BGTZ	PC_GEN	EXT_B	RD_NOP	CMP_BGTZ	PC_BC	FSM_CUR	MUXA_NOP	MUXB_NOP	ALU_NOP	DIS	DMEM_NOP	DIS	WB_NOP
BLEZ	PC_GEN	EXT_B	RD_NOP	CMP_BLEZ	PC_BC	FSM_CUR	MUXA_NOP	MUXB_NOP	ALU_NOP	DIS	DMEM_NOP	DIS	WB_NOP
BNE	PC_GEN	EXT_B	RD_NOP	CMP_BNE	PC_BC	FSM_CUR	MUXA_NOP	MUXB_NOP	ALU_NOP	DIS	DMEM_NOP	DIS	WB_NOP
J	PC_INC	EXT_J	RD_NOP	CMP_NOP	PC_J	FSM_NOP	MUXA_NOP	MUXB_NOP	ALU_NOP	DIS	DMEM_NOP	DIS	WB_NOP
JAL	PC_INC	EXT_J	RD_R31	CMP_NOP	PC_JR	FSM_NOP	MUXA_PC	MUXB_RT	ALU_PA	EN	DMEM_NOP	EN	WB_ALU
LI	PC_GEN	EXT_SIGN	RD_RT	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_RS	MUXB_EXT	ALU_PB	EN	DMEM_NOP	EN	WB_ALU
LUI	PC_GEN	EXT_S2H	RD_RT	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_RS	MUXB_EXT	ALU_PB	EN	DMEM_NOP	EN	WB_ALU
SLTI	PC_GEN	EXT_SIGN	RD_RT	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_RS	MUXB_EXT	ALU_SLT	DIS	DMEM_NOP	EN	WB_ALU
SLTIU	PC_GEN	EXT_UNSIGN	RD_RT	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_RS	MUXB_RT	ALU_SLTU	DIS	DMEM_NOP	EN	WB_ALU
LW	PC_GEN	EXT_SIGN	RD_RT	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_RS	MUXB_RT	ALU_ADD	DIS	DMEM_LW	EN	WB_MEM
SW	PC_GEN	EXT_SIGN	RD_RT	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_RS	MUXB_RT	ALU_ADD	DIS	DMEM_SW	DIS	WB_NOP
LB	PC_GEN	EXT_SIGN	RD_RT	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_RS	MUXB_RT	ALU_ADD	DIS	DMEM_LB	EN	WB_MEM
LH	PC_GEN	EXT_SIGN	RD_RT	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_RS	MUXB_RT	ALU_ADD	DIS	DMEM_LH	EN	WB_NOP
LBU	PC_GEN	EXT_SIGN	RD_RT	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_RS	MUXB_RT	ALU_ADD	DIS	DMEM_LBU	EN	WB_MEM
LHU	PC_GEN	EXT_SIGN	RD_RT	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_RS	MUXB_RT	ALU_ADD	DIS	DMEM_LHU	EN	WB_MEM
SB	PC_GEN	EXT_SIGN	RD_RT	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_RS	MUXB_RT	ALU_ADD	DIS	DMEM_SB	DIS	WB_NOP
SH	PC_GEN	EXT_SIGN	RD_RT	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_RS	MUXB_RT	ALU_ADD	DIS	DMEM_SH	DIS	WB_NOP
XORI	PC_GEN	EXT_UNSIGN	RD_RT	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_RS	MUXB_EXT	ALU_XOR	EN	DMEM_NOP	EN	WB_ALU
MFC0	PC_GEN	EXT_NOP	RD_RD	CMP_NOP	PC_NEXT	FSM_NOP	MUXA_SPC	MUXB_RT	ALU_PA	EN	DMEM_NOP	EN	WB_ALU

BREAK	PC_GEN	EXT_NOP	RD_NOP	CMP_NOP	PC_NEXT	FSM_RET	MUXA_NOP	MUXB_NOP	ALU_NOP	DIS	DMEM_NOP	DIS	WB_NOP
SLLV	PC_GEN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN
SRLV	PC_GEN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN
SRAV	PC_GEN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN
JALR	PC_GEN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN
MTHI	PC_GEN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN
MTLO	PC_GEN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN
INVALID	PC_GEN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN
BLTZAL	PC_GEN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN
LWR	PC_GEN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN
LWL	PC_GEN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN
SWL	PC_GEN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN
SWR	PC_GEN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN
INVALID	PC_GEN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN
SYSCALL	PC_GEN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN	IGN