STUDENT LAB SAFETY, HIRARC, DATASHEET VERIFICATION CHECKLIST, AND BRIEF REPORT SUBMISSION

EXPERIMENT X3: BASIC OPERATION OF OSCILLOSCOPE & FUNCTION GENERATOR

STUDENT NAME : _____
MATRIC NO. : _____
GROUP : _____
DATE : _____

A. Equipment and System Verification Checklist

Item	Verification Requirement	✓
Function Generator	Output leads and BNC connections are intact; red and black crocodile clips are not shorted.	☐
Function Generator	Required waveform, frequency and Vpp are verified before connection to the circuit.	☐
Oscilloscope	Probe, ground clip and selected channel are correctly connected.	☐
Oscilloscope	Sec/Div, V/Div and probe/channel settings are suitable for the measurement.	☐
Breadboard / Leads	No damaged contacts, loose jumpers or exposed conductors are observed.	☐
Resistors	Two 2.2 kΩ resistors are identified and connections are checked against Fig. 5.	☐
Multimeter	AC-voltage mode is selected before measuring the sinusoidal output.	☐
Circuit	All connections are checked before equipment is switched ON.	☐

B. HIRARC Checklist (OSH-Based Risk Assessment)

Hazard / Unsafe Condition	Potential Consequence	Control Measure	✓
Short circuit between FG red and black clips	Damage to the function generator / leads	Keep output clips separated and verify connections before switching ON.	☐
Changing wiring while equipment is energised	Short circuit, component or equipment damage	Switch OFF the FG/DSO output or equipment before modifying connections.	☐
Incorrect oscilloscope ground connection	Unintended short circuit and incorrect measurement	Connect probe ground only to the circuit reference/ground point specified.	☐
Loose or incorrect breadboard connection	Unstable readings or unintended circuit condition	Inspect wiring and firmly seat components/jumpers before operation.	☐
Incorrect FG amplitude/frequency setting	Incorrect results or excessive applied signal	Verify frequency and Vpp on the DSO before proceeding.	☐
Damaged leads, probes or cables	Unreliable measurement or exposure to electrical fault	Do not use damaged accessories; report and replace them before use.	☐
Trailing cables / untidy workspace	Trip, snagging or equipment displacement	Keep leads organised and the work area clear.	☐
Equipment left energised after experiment	Unnecessary electrical/equipment risk	Switch OFF FG, DSO and power outlet; return probes/components neatly.	☐

C. Engineering Practice Verification

Requirement	✓
Connections and instrument settings checked before energising.	☐
Measured frequency/Vpp compared with the specified FG settings.	☐
Saved/captured waveforms correspond to the correct test condition.	☐
Test 5 DSO and multimeter readings recorded using the correct Vpp/Vrms quantities.	☐
Work area and laboratory equipment restored after completion.	☐

D. Student Declaration

I confirm that I have completed the above verification and HIRARC checks, followed the laboratory safety requirements, and will report any unsafe condition or equipment fault to the demonstrator/technician.

Student Signature : _____

Date : _____

E. Experimental Results Record

Test 2 & 3: Generating Signals & Changing Parameters

Task	FG Frequency (Hz)	FG Vpp (Vpp)	Measured f (Hz)	Measured Vpp	Sec/Div	V/Div
TEST 2	50	10				
TEST 3 (Case 1)	500	6				
TEST 3 (Case 2)	3000	12				
TEST 3 (Case 3)	85000	10				
TEST 3 (Case 4)	200000	16				
TEST 3 (Case 5)	100	4				

Test 4: Advanced Functions (Waveforms)

Waveform	FG f (Hz)	FG Vpp	Measured f	Measured Vpp	Brief Observation
Square	50	10			
Sawtooth	50	10			

Test 5: Measurement using DSO & Multimeter

Measurement	Device Used	Measured Value (V)	Calculated Value (V)	% Error
Input (a)	DSO (CH1)	Vpp =	Vpp =	
Output (b)	DSO (CH2)	Vpp =	Vpp =	
Output (b)	Multimeter (AC)	Vrms =	Vrms =	
Output (b)	Calculated from DSO (CH2)	Vrms =	Vrms =	

DISCUSSION:

CONCLUSION:

LAB LECTURER

SIGNATURE : _____

DATE : _____

INSTRUCTOR

SIGNATURE : _____

DATE : _____