

Scheme of Practical Examination
XII – HSC Vocational – Technical Group
ELECTRONICS TECHNOLOGY

Introduction

Higher Secondary Vocational Courses are included under the broad category of Vocational Education. These courses include both educational process as well as acquisition of practical skills, knowledge and values relating to various occupations. Practical Training is an essential component of vocational courses. It helps in developing the required competencies with adequate precision. The practical training is achieved through Term work, Project work, On Job training (OJT) and Industrial visits. Today employers are looking for individuals who are knowledgeable, skilled, more flexible and have capacity to adjust to the needs of organization. These programs will help in developing *generic skills or core* work skills and positive attitude.

Term Work : Term work includes the performance of students in 80% experiments from the list of practicals throughout the year.

Project Work: Project work is an assignment given to students during each term/year. Activities such as specimen collection, market survey, field visits, participation in exhibition, maintenance of laboratory equipments etc. can be given as project work. Such activities could be given to individual or group of students.

On Job Training : In order to be enriched with practical experience, a student can be taken to a service centre, repair centre or production unit to work in a real life situation, under the guidance of an expert practitioner. He will be evaluated jointly by the teacher and the expert. Linkage between the school and industry/ establishment is an important feature of vocational education program. Memorandum of Understanding can be established between school and industries.

Students are sent to the nearby institute / establishment/ factory / laboratory to get hands on practice / experience in doing the job and gaining experience.

Following things are expected –

OJT sessions should be arranged during vacation for XIth students. The evaluated marks are to be awarded at the end of XII std Practical examination.

Engineering and Technology Group

1. ELECTRONICS TECHNOLOGY (EA, EB, EC)

Instructions to the Head of the Institute

1. The program of practical examination is to be finalized and notified on the notice board by the Head of the Institute in accordance with the instructions regarding the conduct of the examinations laid down by the Divisional Board.
2. In case the external examiner fails to report or inform the Head of the Institute, is authorized to make the necessary emergency appointment in his place and inform the Divisional Board accordingly.
3. The Head of the Institute should see that proper arrangements (**Lab. Accommodation and Equipments as per H.S.C Board Syllabus**) are made for conducting the practical examination in consultation with the internal.
4. The Head of the Institute should immediately hand over the packet of related documents received from H.S.C Board office to the examiners concerned before the exams.
5. The Head of the Institute should immediately display the Instructions to candidate on proper notice board along with the time table.
6. Both the internal and external examiners will be appointed by the Divisional Board.
7. The following laboratory staff will be appointed for a batch of 12 students:
 - a) Expert Assistant (Instructor) - 1
 - b) Workshop / Laboratory Assistant - 1
 - c) Peon (Helper) - 1

The Remuneration of above staff will be paid as per the H.S.C board Rules.

ELECTRONICS TECHNOLOGY (EA, EB, EC)

Instructions to the Examiners and Scheme of Marking

1. Experiment which have been conducted during the year should be kept for the practical examination. (Minimum 80 % experiments of each paper).
2. The candidate should be given one experiment by lot system from each paper. Period of examination will be three hours for each paper. Change of experiment should be avoided as far as possible. However the internal examiner can change the allotted experiment in consultation with the external examiner, if the candidate has not performed and entered the allotted experiment in the journal.
3. Examiner should see that in a batch every candidate performs a different experiment.
4. Examiner should personally verify at every stage whether each sub-question in the given slip is answered or not.
5. The assessment of answer books and the conduct of practical examination will be done jointly by both the examiners.
6. In case of any dispute the decision of the external examiner will be final.
7. The external examiner should check the journal and project work completed during the year by the candidate.
8. The marks for O.J.T. and I.V. should be given by both external and internal examiner as per the marking scheme given by the Board office.

Following scheme of marking should be followed

a)	Experiment	60 marks	80 marks
	Oral	20 marks	
b)	Journal – Term Work		10 marks
c)	Project work		10 marks
d)	O.J.T - On Job Training		10 marks
d)	I.V – Industrial Visit		10 marks

Total Marks (Each paper) 120 marks

9. Scheme of Marking for assessment of O.J.T. work -----10 marks

10) Industrial Visit report submitted by each student 10 marks.

ELECTRONICS TECHNOLOGY (EA, EB, EC)

Instructions to the Candidate

1. Candidates should bring with them their certified journals, project report, O.J.T. and I.V reports with Concerned Certificates , project etc.
2. All reports and journals should be certified by the Head of the Institution or Head of the Vocational Department with counter signature of practical in charge.
3. Candidates should remain present at least 15 minutes before the commencement of the examination.
4. Candidates should read the slip carefully and answer all the questions in the slip.
5. List of components should necessarily include its type, tolerance, wattage, voltage rating, current rating etc.
6. Use of log-tables is allowed. Use of Pocket calculator, Scientific calculator is not allowed.
7. Use of any electronic gadgets (cell phone , digital watch, pager, I pod, etc) are not allowed.
8. In case of any difficulty, the candidate should approach the concerned examiner.
9. Switch on the circuit only after getting the connections checked by the examiner.
10. After finishing the experiment switch off the circuit / power supply / soldering iron etc.
11. Leave your table neat and clean.
12. Keep silence in the examination hall.

XII - Electronics Technology
Paper I Applied and Industrial Electronics (EA)
Practical Question Papers

1. **Determination of gain of Inverting amplifier.**
Assemble circuit of inverting amplifier using IC741 and measure output for two different inputs.
- a. Draw circuit diagram and Write specification of components (10)
 - b. Assemble the circuit and get it checked (10)
 - c. Write working /explanation (10)
 - d. Apply two different inputs and measure output and tabulate observations (10)
 - e. Observe waveform on CRO and plot it on graph paper (10)
 - f. Compare theoretical and practical gain of Inverting Op-Amp (10)
 - g. Oral (20)
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2. **Determination of gain of Non- Inverting amplifier.**
Assemble circuit of non-inverting amplifier using IC741 and measure output for two different inputs.
- a. Draw circuit diagram and Write specification of components (10)
 - b. Assemble the circuit and get it checked (10)
 - c. Write working /explanation (10)
 - d. Apply two different inputs and measure output and tabulate observations (10)
 - e. Observe waveform on CRO and plot it on graph paper (10)
 - f. Compare theoretical and practical gain of Non-Inverting Op-Amp (10)
 - g. Oral (20)
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3. **Study Op-Amp as Inverting Adder.**
Assemble circuit of inverting adder using IC741 and measure output for three different inputs.
- a. Draw circuit diagram and Write specification of components (10)
 - b. Assemble the circuit and get it checked (10)
 - c. Write working /explanation (10)
 - d. Apply two different inputs and measure output and tabulate observations (10)
 - e. Observe waveform on CRO and plot it on graph paper (10)
 - f. Compare theoretical and practical gain of Inverting adder (10)
 - g. Oral (20)
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4. Study Op-Amp as Subtractor.

Assemble circuit of Op-Amp as Subtractor using IC741 and measure output for three different inputs.

- a. Draw circuit diagram and Write specification of components (10)
 - b. Assemble the circuit and get it checked (15)
 - c. Write working /explanation (10)
 - d. Apply two different inputs and measure output and tabulate observations (10)
 - e. Compare theoretical and practical readings of Op-Amp as Subtractor (15)
 - f. Oral (20)
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5. Study Op-Amp as Integrator.

Assemble circuit of Op-Amp as Integrator using IC741

- a. Draw circuit diagram and Write specification of components (15)
 - b. Assemble the circuit and get it checked (15)
 - c. Write working /explanation (15)
 - d. Apply sine and square wave input. Observe waveform on CRO and plot it on graph paper (15)
 - e. Oral (20)
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6. Study Op-Amp as differentiator.

Assemble circuit of Op-Amp as differentiator using IC741

- a. Draw circuit diagram and Write specification of components (15)
 - b. Assemble the circuit and get it checked (15)
 - c. Write working /explanation (15)
 - d. Apply sine and square wave input. Observe waveform on CRO and plot it on graph paper (15)
 - e. Oral (20)
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7. Study Op-Amp as Buffer.

Assemble circuit of Op-Amp as Buffer (Voltage follower) using IC741

- a. Draw circuit diagram and Write specification of components (15)
 - b. Assemble the circuit and get it checked (15)
 - c. Write working /explanation (15)
 - d. Apply different DC inputs. Measure outputs tabulate observations in a table (15)
 - e. Oral (20)
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8. Study Op-Amp as Comparator.

Assemble circuit of Op-Amp as +ve and -ve reference Comparator using IC741

- a. Draw circuit diagrams and Write specification of components (15)
 - b. Assemble the circuit and get it checked (10)
 - c. Write working /explanation (10)
 - d. Apply different DC inputs. Measure outputs tabulate observations in a table (15)
 - e. Write any two Applications (05)
 - f. Oral (20)
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9. Study Op-Amp as Schmitt's Trigger.

Assemble circuit of Op-Amp as Schmitt's Trigger using IC741

- a. Draw circuit diagrams and Write specification of components (10)
 - b. Assemble the circuit and get it checked (15)
 - c. Write working /explanation (10)
 - d. Apply different DC inputs. Measure UTP and LTP. Tabulate observations in a table (15)
 - e. Observe waveform by applying different sine waves on CRO (10)
 - f. Oral (20)
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10. Study of IC 555 as Monostable Multivibrator.

Assemble circuit of Monostable Multivibrator using IC 555

- a. Draw circuit diagrams and Write specification of components (15)
 - b. Assemble the circuit and get it checked (10)
 - c. Design and Test the circuit for given $T = \text{----sec.}$ (15)
 - d. Measure outputs tabulate observations (10)
 - e. Compare theoretical and practical time period (10)
 - f. Oral (20)
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11. Study of IC 555 as Astable Multivibrator.

Assemble circuit of Astable Multivibrator using IC 555

Given : $R_a = \text{---}$, $R_b = \text{---}$, $C = \text{---}$

- a. Draw circuit diagrams and Write specification of components (10)
 - b. Assemble the circuit and get it checked (10)
 - c. Calculate frequency, duty cycle. (10)
 - d. Measure frequency and duty cycle on CRO. (10)
 - e. Measure outputs tabulate observations (10)
 - f. Compare theoretical and practical time period (10)
 - g. Oral (20)
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12	Study of Opto-coupler	
	a) Draw circuit diagram with components specification	(15)
	b) Assemble the circuit and get it checked	(15)
	c) Working/ explanation	(15)
	d) Internal diagram and Pinout diagram of opto-coupler	(15)
	e) Oral	(20)
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13.	Study of Solar Cell and Solar appliances	
	a) Design Solar Cell Arrangement for given Load	(20)
	b) Assemble the panel	(20)
	c) Connect the load and test it	(20)
	d) Oral	(20)
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14	Speed control of DC Motor	
	a) Draw circuit Diagram	(15)
	b) Enlist components with specifications	(15)
	c) Assemble the circuit	(15)
	d) Test the circuit and take the readings	(15)
	e) Oral	(20)
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15	Study of FSK	
	a) Draw circuit Diagram	(15)
	b) Enlist components with specifications	(15)
	c) Assemble the circuit	(15)
	d) Test the circuit and take the readings	(15)
	e) Oral	(20)
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16.	Study of V-I characteristics of photo-diode	
	a) Draw circuit Diagram	(15)
	b) Enlist components with specifications	(15)
	c) Assemble the circuit	(15)
	d) Test the circuit and take the readings	(15)
	e) Oral	(20)
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XII - Electronics Technology

Paper II Modern Instruments and communication systems (EB)

1) Study of Thermistor (NTC/PTC)

- a) Measure the resistance of thermistor for different temperature (room temp . to 80 °c) while heating & cooling gradually take reading for every degree of temperature (15)
- b) Calculate the average resistance (heating and cooling) for every temperature reading (15)
- c) Plot a graph of resistance verses temperature (15)
- d) Explanation / working (10)
- e) Application of Thermistor (5)
- f) Oral (20)
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2) Use of condenser microphone as transducer in Clap Switch

Construct clap switch using condenser mike on tag board

- a) Circuit diagram (15)
- b) Specification of components (15)
- c) Assemble the circuit on tag board and get it check by examiner (15)
- d) Test the circuit for ON and OFF positions (15)
- e) Oral (20)
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3) Reconing of Speaker

- a) Draw diagram (15)
- b) Specification of speaker components (15)
- c) Assemble /recone the speaker (15)
- d) Test the speaker for DC and AC (15)
- e) Oral (20)
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4) To Study the V-I Characteristics of photocell

- (a Draw the circuit diagram and write specifications of components (15)
- b) Assemble the circuit and check it by examiner (10)
- c) Take readings for V I characteristic by keeping the light intensity constant (15)
- d) Explanation/Working (10)
- e) Draw the graph (10)
- f) Oral (20)
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- 5) To verify the RPM of DC motor by using opto-coupler circuit**
- a) Draw the internal diagram and pin out diagram of opto coupler (15)
 - b) Draw the circuit diagram to verify rpm of DC motor (15)
 - c) Measure input diode current and open collector current for different diode voltage(15)
 - D) Set the circuit to verify RPM of DC motor. Observe the waveform on CRO (10)
 - e) Measure the RPM using frequency of CRO (10)
 - d) Oral (20)
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- 6) To construct multirange Ammeter using galvanometer**
- a) Draw the circuit diagram and write specifications (15)
 - b) Assemble the circuit and check it by examiner (10)
 - c) Find the value of shunt resistor for --- amps. and ----- amps. current ranges (15)
 - d)Take readings (10)
 - e)Result (10)
 - f)Oral (20)
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- 7) To construct multirange voltmeter using galvanometer**
- a)Draw the circuit diagram and specification of each part (15)
 - b) Assemble the circuit and check it by examiner (15)
 - c) Find the value of series resistor for ----Volts and ----- Volts. Voltage ranges (10)
 - d)Take readings (10)
 - e) Result (10)
 - f)Oral (20)
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- 8) To study the front panel of CRO**
- a) Draw the front panel diagram of CRO (20)
 - b) Show the use of following controls to Examiner
Horizontal control, Vertical control, focus,
intensity, AC/DC, time/div, volts/div, trigger, auto, X*5 (40)
 - c)Oral (20)
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9)	To measure frequency, period, AC and DC voltage with help of CRO	
a)	Draw the diagram to measure frequency and period for application of sine and square wave	(30)
b)	Draw the diagram to measure AC voltage.	(15)
c)	Draw the diagram to measure DC voltage.	(15)
d)	Oral	(20)
10)	To measure phase and frequency on CRO with help of internal time base(Direct method) and lissageous figures	
a)	Draw the diagram to measure frequency using internal time base and lissageous figure	(20)
b)	Measure frequency and phase using internal time base	(20)
c)	Measure frequency and phase using lissageous figure	(20)
d)	Oral	(20)
11)	To build and study of AM modulator circuit	
a)	Draw the circuit diagram and specification of each part	(15)
b)	Assemble the circuit and check it by examiner	(15)
c)	Explanation/Working	(10)
d)	Apply two diff input and tabulate output	(10)
e)	Draw the waveforms on graph paper after observation on CRO	(10)
f)	Oral	(20)
12)	To construct and to study AM Demodulator	
a)	Draw the circuit diagram and write specification of each part	(15)
b)	Assemble the circuit and check it by examiner	(25)
c)	Draw the input output waveforms on graph paper	(20)
e)	Oral	(20)

13) Installation of DTH

- a) Assemble and install dish with set top box (30)
 - b) Procedure of installation (10)
 - c) Test for signal and check signal strength (20)
 - d) Oral (20)
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14) Downloading of various Educational Apps on Android Mobile

- a) Download any two educational apps on cell phone (20)
 - b) Check it by examiner (20)
 - c) Explanation /Working of that application (20)
 - e) Oral (20)
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15) Study of television controls

- a) Enlist all television controls of TV receiver set which are controlled by remote (20)
 - b) Adjust and show different settings of television set by remote (20)
 - c) Explanation/Working (20)
 - d) Oral (20)
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XII - Electronics Technology
Paper III Computer Hardware and Networking (EC)
Practical Question Papers

1.	Architecture and Pinout diagram of μP 8085	
a.	Draw architecture of μ P 8085.	15
b.	Label all blocks and data flow neatly.	15
c.	Draw Pinout diagram of μ P 8085.	20
d.	Write features of μ P 8085.	10
e.	Oral	20
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2.	Data Storage using different addressing modes	
a.	Write a program for storage in Memory using data transfer instructions	10
b.	Execute the program	10
c.	Check and show results	10
d.	Write a program for storage in Registers(8085) using data transfer instructions	10
e.	Execute the program	10
f.	Check and show results	10
g.	oral	20
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3.	Addition of Data stored in any two Registers	
a.	Write ALP to add two hexadecimal numbers stored in registers	15
b.	Write opcodes for above program	15
c.	Enter the program on microprocessor kit.	10
d.	Execute the program	10
e.	Check and show results	10
f.	Oral	20
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4.	Addition of Data stored in memory	
a.	Write ALP to add two hexadecimal numbers stored in memory	15
b.	Write opcodes for above program	15
c.	Enter the program on microprocessor kit.	10
d.	Execute the program	10
e.	Check and show results	10
f.	Oral	20
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5.	Subtraction of Data stored in any two Registers	
a.	Write ALP to subtract ___HH from ___HH hexadecimal numbers stored in Registers	15
b.	Write opcodes for above program	15
c.	Enter the program on microprocessor kit.	10
d.	Execute the program	10
e.	Check and show results	10
f.	Oral	20
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6.	Subtraction of numbers stored in memory	
a.	Write ALP to subtract ___HH from ___HH hexadecimal numbers Data stored in Registers	15
b.	Write opcodes for above program	15
c.	Enter the program on microprocessor kit.	10
d.	Execute the program	10
e.	Check and show results	10
f.	Oral	20
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7.	Logical and Branching Instructions	
a.	Write a simple Program to understand Logical instructions and Branching conditional and unconditional instructions	15
b.	Write opcode for above instructions	15
c.	Enter the program in microprocessor kit.	10
d.	Execute the program	10
e.	Test the Program and show it examiner	10
f.	Oral	20
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- 8. Find Largest number among the given three hexadecimal numbers**
- Write ALP to find largest number among _____, _____, and _____ hexadecimal numbers 20
 - Enter the program in microprocessor kit. 20
 - Execute the program 10
 - Test the Program and show it examiner 10
 - Oral 20
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- 9. Find Smallest number among the given three hexadecimal numbers**
- Write ALP to find Smallest number among _____, _____, and _____ hexadecimal numbers 20
 - Enter the program in microprocessor kit. 20
 - Execute the program 10
 - Test the Program and show it examiner 10
 - Oral 20
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- 10. Move Data Block**
- Write ALP to move the stored block of data in memory location _____ to memory location _____ 20
 - Enter the program in microprocessor kit. 20
 - Execute the program 10
 - Test the Program and show it examiner 10
 - Oral 20
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- 11. Exchange Data Block**
- Write ALP to Exchange the stored block of data in memory location _____ and memory location _____ 20
 - Enter the program in microprocessor kit. 20
 - Execute the program 10
 - Test the Program and show it examiner 10
 - Oral 20
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12.	Multiplication of Data stored in any two registers	
a.	Write ALP to multiply two hexadecimal numbers stored in any two registers	15
b.	Write opcodes for above program	15
c.	Enter the program on microprocessor kit.	10
d.	Execute the program	10
e.	Check and show results	10
f.	Oral	20
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13.	Multiplication of Data stored in memory	
a.	Write ALP to multiply two hexadecimal numbers stored in any two memory locations	15
b.	Write opcodes for above program	15
c.	Enter the program on microprocessor kit.	10
d.	Execute the program	10
e.	Check and show results	10
f.	Oral	20
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14.	8051 Microcontroller	
a.	Draw internal architecture of 8051 Microcontroller.	30
b.	Neat label it.	15
c.	Enlist applications of Microcontroller.	15
d.	Oral	20
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15.	Connectivity Devices	
a.	Draw a neat labelled diagram of MODEM.	15
b.	Draw a neat labelled diagram of HUB.	15
c.	Draw a neat labelled diagram of REPEATER.	15
d.	Draw a neat labelled diagram of ROUTER.	15
e.	Oral	20
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16.	Networking	
a.	Draw and Explain neat labelled diagram of LAN	20
b.	Draw and Explain neat labelled diagram of MAN	20
c.	Draw and Explain neat labelled diagram of WAN	20
d.	Oral	20
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17.	Networking Topologies	
a.	Draw and Explain neat labelled diagram of STAR Networking Topology.	20
b.	Draw and Explain neat labelled diagram of BUS Networking Topology.	20
c.	Draw and Explain neat labelled diagram of RING Networking Topology.	20
d.	Oral	20
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18.	Personal computer	
a.	Draw the block diagram of different parts connected with motherboard of PC.	20
b.	Identify and Enlist it	20
c.	Write the specification of it.	20
d.	Oral	20
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19.	Trouble Shooting of PC	
a.	Identify the any one fault in PC if other peripherals are normal working (PC speed very slow, No display, No booting, key board not r3esponding, no printing ,etc)	20
	Rectify the problem	15
b.		
c.	explain the problem	15
d.	Test and Show it examiner	10
e.	Oral	20
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