राष्ट्रीय इलेक्ट्रॉनिकी एवं सूचना प्रौद्योगिकी संस्थान (रा.इ.सू.प्रौ.सं.)
National Institute of Electronics and Information Technology (NIELIT)
(An ISO 9001 : 2008 Certified Organisation)
इलेक्ट्रॉनिकी और सूचना प्रौद्योगिकी मंत्रालय, भारत सरकार
Ministry of Electronics and Information Technology, Government of India

No. I-34/7/2020-Academics-Part (2)   Date: 10/3/2023
       16

NOTIFICATION

Subject: 3rd **revision of CHMT (Computer Hardware Maintenance Technician) -O Level.**

     This notification is being issued in suppression of all the earlier notifications issued regarding revision of NIELIT (erstwhile DOEACC) O Level Course in Computer Hardware and Maintenance by National Institute of Electronics and Information Technology (NIELIT).

2.   By this notification, it is notified for the general public including all stake-holders that the 3rd revision of **CHMT (Computer Hardware Maintenance Technician) -O Level Syllabus** will be effective for teaching from March 2023. No fresh admission will be given as per as per the 2nd revised syllabus (CHM-O Level). The detailed revised syllabus is available at the website link http://nielit.gov.in/content/computer-course-0. This qualification has been approved by NCVET, MSDE in its 21st Meeting of the NSQC and aligned at Level-4 of NSQF. Further, on recommendation of NCVET, the qualification name of CHM O Level has been changed from CHM (Computer Hardware & Maintenance) O Level to CHMT (Computer Hardware Maintenance Technician)- O Level.

3.   The First examination based on this syllabus will be held in July 2023. Candidates undergoing training/examinations as per the existing syllabus (2nd revised syllabus) will be provided last chance in August 2024. March 2023 onwards registration/admission will be given as per the new revised syllabus (3rd revision)

       16/3/2023
(R.P. Pandey)
Registrar

इलेक्ट्रॉनिकी और सूचना प्रौद्योगिकी मंत्रालय, भारत सरकार की एक स्वायत्त वैज्ञानिक संस्था
An Autonomous Scientific Society of Ministry of Electronics and Information Technology, Government of India
नाइलिट भवन, प्लॉट न. 3, पीएसपी पॉकेट, इंस्टिट्यूशनल एरिया, सेक्टर—8, द्वारका, नई दिल्ली—110 077
NIELIT Bhawan, Plot No. 3, PSP Pocket, Institutional Area, Sector-8, Dwarka, New Delhi-110 077
वैबसाइट/Website - www.nielit.gov.in

Information Booklet cum Syllabus

of

CHMT (Computer Hardware Maintenance Technician) 'O' Level Course

Revision-III

March 2023

National Institute of Electronics and Information Technology

CONTENTS

1. About the Revised Syllabus

The second revised version of CHMT (Computer Hardware Maintenance Technician) O Level course in Computer Hardware Maintenance syllabus came into effect in August 2015 examinations. Since then, much advancement has been observed in the area of Information Technology and Computer Hardware. The need of industry has also changed with the availability of new and advanced technologies. With the advancement in technologies, the hardware selected jobs have also changed. This also has led to change in job profile. Different job roles require different skills. Moreover, the digital initiatives taken by Government have also changed the way the business is taking place these days. These factors have led to bringing the revision in syllabus of CHM-O Level course.

This document presents the third revised version of CHMT (Computer Hardware Maintenance Technician) O Level course in Computer Hardware Maintenance syllabus, which becomes effective for teaching with effect from its notification. The syllabus of CHMT (Computer Hardware Maintenance Technician) O Level course is designed to enhance the skills of students so as to get job or enable them to be entrepreneur. The self-learning approach is built into the syllabus enabling the learners to update themselves on the changing hardware scenario in their area of work. The syllabus has been designed to meet the skills required for various IT job roles.

2. NIELIT

National Institute of Electronics and Information Technology, NIELIT, (Erstwhile DOEACC Society) is an autonomous scientific society of the Ministry of Electronics & Information Technology, Government of India. The Society is registered under the Societies Registration Act, 1860. NIELIT was set up to carry out Human Resource Development and related activities in the area of Information, Electronics & Communications Technology (IECT). NIELIT is engaged both in Formal & Non-Formal Education in the area of IECT besides development of industry-oriented quality education and training programmes in the state-of-the-art areas. NIELIT has endeavoured to establish standards to be the country's premier institution for Examination and Certification in the field of IECT. It is also one of the National Examination Body, which accredits institutes/organizations for conducting courses in IT and Electronics in the non-formal sector.

Over the last three decades, NIELIT has acquired very good expertise in IT training through its wide repertoire of courses. These courses are as under.
- ➢ 'O' Level
- ➢ 'A' Level
- ➢ 'B' Level
- ➢ 'C' Level
- ➢ Digital Literacy Courses
  - o ACC (Awareness in Computer Concepts)
  - o BCC (Basic Computer Course)
  - o CCC (Course on Computer Concepts)

- CCC+ (Course on Computer Concepts Plus)
- Expert Computer Course

At present, NIELIT is operating from offices located at Itanagar, Pasighat, Tezu, Guwahati, Jorhat, Dibrugarh, Silchar, Kokrajhar, Majuli, Tezpur, Patna "Alawalpur (Saksharta Kendra)", "Lakhanpur (Saksharta Kendra)", Chandigarh, Delhi, Daman, Kurukshetra, Shimla, Mandi, Srinagar, Jammu, Leh, Kargil, Ranchi, Calicut, Aurangabad, Imphal, Churachandpur, Senapati, Shillong, Tura, Aizawl, Lunglei, Kohima, Chuchuyimlang, Dimapur, Bhubaneswar, Ropar, Ajmer, Pali, Gangtok, Chennai, Agartala, Gorakhpur, Lucknow, Haridwar, Kolkata with its Headquarters at New Delhi. It is also well networked throughout India with the presence of about 900+ accredited institutes. The Headquarters is situated at NIELIT Bhawan, Plot No. 3, PSP Pocket, Institutional Area, Sector 8, Dwarka, New Delhi – 110 077.

3. Objective of Computer Hardware Maintenance Course

The objective of the Scheme is to generate skilled manpower in the area of Computer Hardware, Networking and Electronics at the national level by utilizing the facilities and infrastructure available with the institutions/organizations in the non-formal sector. NIELIT is managed and administered by a Governing Council which consists of eminent academicians and professionals from IT and Electronics industries. Minister for Electronics & Information Technology, Government of India, is the Chairman of the Governing Council. The Director General is the Chief Executive Officer of the Society and manages day to day affairs of the Society. Manifold functions of this Scheme are:

     i.   Accreditation
    ii.   Registration
   iii.   Examination
   iv.   Certification

4. CHMT (Computer Hardware Maintenance Technician) O Level Course

4.1 Objective of CHMT (Computer Hardware Maintenance Technician) O Level Course

The objective of this course is to equip a student with necessary skills as per following job role based on specialisation attained.

i.   Computer Hardware Technician
ii. Computer Networking Technician
iii. Office Automation Maintenance and Technical Support Technician
iv. Customer Care Support Technician

4.2 Structure of CHMT (Computer Hardware Maintenance Technician) O Level Course

The revised syllabus (Revision III) of CHMT ('O' Level) course consists of four compulsory theory modules, one practical and one project. The structure of the CHMT (Computer Hardware Maintenance-Technician) O-Level syllabus is indicated below: -

Module/Practical Code	Module	Learning Hours (Theory)	Learning Hours (Practical/ Tutorials/ Project)	Total Learning Hours
CHMT1-R3	Basics of Computer Hardware	45	75	120
CHMT2-R3	Peripherals and Data Storage Devices	45	75	120
CHMT3-R3	Computer Networking and Hardware	45	75	120
CHMT4-R3	Working and Maintenance of Computer System	45	75	120
CHMT-PR1-R3, CHMT –PR2-R3, CHMT –PR3-R3, CHMT –PR4-R3	4 Practical's will be based on each module i.e. CHMT1-R3, CHMT2-R3, CHMT3-R3 and CHMT4-R3	-	-	-
	Sub-total	**180**	**300**	**480**
CHMT-PJ1-R3	Project	60		60
CHMT-ES-R3	Employability Skills	60		60
	Total	**600**		

4.3 Duration of the Course

The duration of the CHMT (Computer Hardware Maintenance Technician) O Level course is 600 learning hours and the minimum period to cover contents is one year for candidates undergoing CHMT (Computer Hardware Maintenance-Technician) O Level after 10+2 or equivalent qualifications (mentioned in para -11.1) and six months for candidates undergoing 'O' Level after Graduation.

5   Practical

The students have to devote time allotted to each module of the course for the practical sessions. Practical assignments have been worked out for each theory module. The 4 Practical examinations will be on the syllabi CHMT1-R3, CHMT2-R3, CHMT3-R3 and CHMT4-R3 modules of CHMT (Computer Hardware Maintenance Technician) O Level course.

6   Improvement

The candidates are allowed to improve his/her grade in one subject immediately after clearing all the theory papers (immediate to last examination where the candidate has cleared his/her last paper).

7   Project

CHMT (Computer Hardware Maintenance Technician) O Level courses has a project as an important component. The project is carried out by the student under guidance and support of faculty and management of Institute /Organization where the student is undergoing training. It is felt that such a project provides an opportunity to the student to apply his / her knowledge and skills to know hardware components, problem and troubleshooting. The project should be given utmost importance and priority both by the students as well as institution faculty / management in respect of its identification, planning and implementation. Preferably, students are to complete project work at industry premises.

7.1   Objective of the Project

The objective of the project is to give the students additional hands-on experience in solving a real-life problem by applying knowledge and skills gained on completion of theory papers in a course at a given Level. The project also helps the students to realize the importance of resource and time management, ownership of tasks towards deliverables, innovation and efficiency in task management apart from presentation skills. It also provides a good opportunity for students to build, enhance and sustain high levels of professional conduct and performance and evolves a problem solver frame of mind in the students. It is also felt that taking up the project by a student prepares him/her for a job in the industry and elsewhere.

7.2   Project Submission

The student undergoing the course CHMT (Computer Hardware Maintenance Technician) O-Level Course has to submit a project in order to be CHMT (Computer Hardware Maintenance Technician) O Level certified. The project should be original and relevant to the industry. The project should not be a copy of existing material from any other source.

The Learners (Students) are expected to carry out a project successfully and submit the project certificate in the prescribed format from the head of the institute running the accredited course or the organization of which the learner is an employee. Performa of the Project Completion Certificate is given on the next page

Performa of the Project Completion Certificate

This is to certify that the Project work done by Mr./Ms._____ (NIELIT Registration No._____) in partial fulfilment of CHMT (Computer Hardware Maintenance-Technician) O Level Course Examination at _____ has been found satisfactory.

This report has not been submitted for any other examination and does not form part of any other course undergone by the candidate.

Signature
Name:
(By Head of the Institution) with PROV No. /FULL No.)
Or
Signature
(Name of Head of the Organization / Division)
Division:
Organization Name:
Address:

8   Credit Scheme for CHMT (Computer Hardware Maintenance Technician) O Level Course

8.1   Calculation of Credits

Credit calculation based on NCVET guidelines i.e. 1 credit of 30hrs (both theory & practical's) is as under -

Sr. No.	Module Code	Module Name	No. of Lecture Theory Hours	No. of Tutorial/ Practical /Project Hours	Theory Credits	Practical Credits	Total Credits
			(A)	(B)	(C=(A)/ 30)	(D=((B)/ 30)	(E=(C) + (D))
1.	CHMT1-R3	Basics of Computer Hardware	45	75	1.5	2.5	4
2.	CHMT2-R3	Peripherals and Data Storage Devices	45	75	1.5	2.5	4
3.	CHMT3-R3	Computer Networking and Hardware	45	75	1.5	2.5	4
4.	CHMT4-R3	Working and Maintenance of Computer System	45	75	1.5	2.5	4
5.	CHMT-PJ1-R3	Project	60				2
6.	CHMT-ES-R3	Employability Skills	60		*	*	*
		Total Credits					**18**
*Credit is not applicable for the Employability skills							

9   Examination Pattern

The first examination with the revised syllabus will be held as per the notification issued by NIELIT in this regard. Dates for the various activities related to examinations will be announced on NIELIT website, well in advance of the examinations.

Laboratory/ Practical work will be conducted at Institutions/organizations, which are running the course. NIELIT will be responsible for holding the examination for the theory and practical both for the students from Accredited Centres. The accredited institutes are obliged to facilitate the conduct of Practical Examinations and arrange infrastructure, support of its faculty and staff for the conduct of Practical Examination at their Centre. Only practical fees as decided

from time to time by NIELIT are payable and institutes are not allowed to charge any fee from the candidates for facilitating the practical examination separately.

9.1 The examination pattern of each module/paper is tabulated below:

Examination	Duration	Mode of Examination	No. of Questions	Pattern of Question	Max. Marks	Min. Pass Marks	Weightage in Final Total per paper/Module
Theory	2 Hours	Online / OMR	100	MCQ	100	33%	60%
Practical & Viva	3 Hours	Lab Session / Online	3/4	Demonstration	80	33%	40%
				Viva	20		
Minimum Pass Percentage is 50% of total weightage (Theory + Practical) in each module							

9.2 Minimum and Maximum Marks Matrix is as under:

	Title of Component and Identification	Theory Marks		Practical Marks		Module Marks (60% of Theory Marks+ 40% of Practical Marks)	
		Min	Max	Min	Max	Min	Max
1	CHMT1-R3: Basics of Computer Hardware	33	100	33	100	50	100
2	CHMT2-R3: Peripherals and Data Storage Devices	33	100	33	100	50	100
3	CHMT3-R3: Computer Networking and Hardware	33	100	33	100	50	100
4	CHMT4-R3: Working and Maintenance of Computer System	33	100	33	100	50	100

6	CHMT PJ1-R3: Project	Project completion certificate is required to qualify CHMT-O level
7	Employability Skills	Employability Skills qualifying certificate is required to qualify CHMT-O level
	Maximum Marks in the level	400

Note: -Question paper for Employability Skills will be of 100 marks (objective type), candidate is required to score at least 50% marks to qualify the paper, however, these marks will not be considered while calculating the pass percentage of the course.

9.3. The qualification matrix for each module/paper is:

Theory	Practical	Result	Re-appear
Pass (Qualifying 33% criteria)	Pass (Qualifying 33% criteria)	Pass (Qualifying 50% criteria)	NA
Pass (Qualifying 33% criteria)	Pass (Qualifying 33% criteria)	Fail (Not qualifying 50% criteria)	Need to re-appear in both theory and practical.
Pass (Qualifying 33% criteria)	Fail (Not qualifying 33% criteria)	Qualifying 50% criteria, but Fail	-do-
Fail (Not qualifying 33% criteria)	Pass (Qualifying 33% criteria)	Qualifying 50% criteria, but Fail	-do-
Fail (Not qualifying 33% criteria)	Fail (Not qualifying 33% criteria)	Fail	-do-
Absent (Zero marks would be awarded)	Pass / Fail (as per 33% qualifying criteria)	Fail	-do-
Pass/Fail (as per 33% qualifying criteria)	Absent (Zero marks would be awarded)	Fail	-do

9.4. There would be no negative marking in theory examination.

9.5. The marks will be translated into grades, while communicating results to the candidates. No rounding takes place in the calculation of grades. The gradation structure is as given-

Pass Percentage	Grade
Failed (<50)	F
>= 50% to < 55%	D

>= 55% to < 65%	C
>= 65% to < 75%	B
>= 75% to < 85%	A
>=85%	S

9.6. The candidates would be required to apply for the examinations at the online portal as per the existing procedure.

9.7. The candidates would be issued separate Admit Cards for appearing in Theory and Practical Examinations.

9.8. The candidates would be issued other examination related instructions/guidelines along with the Admit Card.

10. Award of Certificates

The students would be eligible for the award of CHMT (Computer Hardware Maintenance-Technician) O Level certificate on successfully qualifying the Theory/practical Examinations of all modules, Employability Skills and the Project. The CHMT (Computer Hardware Maintenance Technician) O Level course is currently aligned at NSQF (National Skill Qualifications Framework) level 4.

11. Registration

Registration is a pre-requisite for appearing in CHMT (Computer Hardware Maintenance Technician) O Level examinations. A candidate can register at only **one level** at a time to appear for the examination. Registration is only for candidates and not for institutes. Candidate has to register with NIELIT through online portal.

11.1 Eligibility Criteria
The eligibility criteria for registration at CHMT (Computer Hardware Maintenance Technician) O Level are as follows:

11.1.1 Students from Institutes conducting accredited courses:

12ᵗʰ Pass

Or

10th + 2 Years ITI Certificate in relevant field

Or

10th + 1 Year ITI Certificate with one year of experience post qualification in the relevant field.

Or

Successful completion of the second year of a Government recognized polytechnic engineering diploma course after class 10, Training of CHMT 'O' Level course concurrently during the third year of the said 3 years Polytechnic engineering diploma course. The certificate of CHMT 'O' level will be awarded only after successful completion of the polytechnic engineering diploma.

Or

NSQF Level 3 Certified with 2 Years of experience.

For getting registered, a candidate fulfilling the eligibility criteria should apply online through NIELIT portal. Registration fee is also to be paid online. Registration fee once paid is not reimbursable or adjustable against any other payment.

Registration Application can be submitted online throughout the year, however cut off dates are specified below for submitting Registration Application for each Examinations Cycle for the convenience of processing and allotting Registration Numbers.

For January Exam Cycle			
Sr. N.	Level	Cut-off date for Institute candidates	Institute Cut-off date for online payment
1	O	30th Sept.	7th Oct.

For July Exam Cycle			
Sr. N.	Level	Cut-off date for Institute candidates	Institute Cut-off date for online payment
1	O	31st March	7th April

Once registered at a particular level, the registration is valid for ten consecutive examinations for CHMT (Computer Hardware Maintenance Technician) O Level, reckoned from the specific examination as indicated in the Registration allocation letter issued to the candidates.

Registration, by itself, does not entitle a candidate to appear for an examination at the Level concerned, unless all conditions, stipulated in the examination application form, and in any other notification, relevant to the examination are fulfilled by the candidate.

12. Re-registration

Candidates who are not able to clear the level within the validity period of initial registration, are allowed to re-register once, at the same level for another full term i.e. 5 years to clear the leftover papers by submitting filled in Registration application and full Registration fee within one year of the expiry of the validity period of existing Registration.

13. Hardware & Software Requirement

S.NO.	Table1: Hardware Requirement
	List of Computer Hardware Component and Trainer Kit
1	Desk Top Trainer Kit
2	Laptop Trainer Kit
3	Keyboard, Wireless Keyboard, Optical Mouse Trainer Kit
4	Dot Matrix Printer Trainer Kit
5	Ink-Jet Printer trainer Kit
6	Laser Printer Trainer Kit
7	All-In-One MFD (Multi-Function Device) Trainer Kit
8	Hub, Bridge, Switch, Router, Gateway Trainer Kit
9	Computer Network Cables Display Board
10	Function Generator
11	Bread Board and Power Supply
12	Variable Power Supply (0-15Volt, 2Amp)
13	Transformer Input-230V, 50Hzs, Output 9-0-9Volt
14	IC 741, IC7805, IC7404, IC7408, IC7432, IC7486, IC7400, IC74LS02, IC74266, IC74153, IC74139, IC74LS669, IC74LS194
15	Digital Multi-Meter
16	Soldering Station
17	Electronic Tool Kit Set
18	Digital Oscilloscope

S. No.	Table2: Software Requirement
	List of Software's
01	Linux OS – Ubuntu (Desk Top and Server)
02	PC Diagnostic Software – PC Doctor
03	Microsoft Windows Server – Latest Edition Windows 2000 Onwards
04	Microsoft OS – Latest Edition Windows 10 Onwards

14. Syllabus of Basics of Computer Hardware (CHMT1-R3)

14.1 Introduction

The module is designed to equip a student in gaining knowledge of Basics of Hardware used in Computers for professional as well as day to day use. It provides theoretical and practical in depth knowledge of various Computer Hardware and its components viz. Power Supply, Motherboard, Memories and I/O ports.

14.2 Objectives

After completing the module, the incumbent will be able to:

➢ Acquire confidence in identification of various hardware components viz. Power Supply, Motherboard, Memories and I/O ports.

➢ Well versed in Installation and Troubleshooting of Power Supply.

➢ Acquire knowledge of Motherboard, Form Factor, and in Depth analysis of Mother Board & its Reliability.

➢ Acquire knowledge in basic Principle and Operation of Primary and Secondary Memory.

➢ Acquire knowledge of Physical Identification and Working of Intel and AMD Chipset.

➢ Acquire knowledge of Bus Definition and Physical Identification and Applications of Ports and Buses on Motherboard.

14.3 Duration

120urs - (Theory: 45 hrs + Practical: 75 hrs)

14.4 Outline of Module

Module Unit	Duration (Theory) in Hours	Duration (Practical) in Hours	Learning Objectives

1. Power Supplies		10	25	After completion of this unit of module, the Learner will be able to ● Know Basic Principles of Power Supplies. ● Get familiar with Connectors of power supply. ● Well Versed in Assembling, Installation, Fault Analysis and Troubleshooting of
2. Mother Board		15	20	After completion of this unit of module, the Learner will be able to ● Get familiar with various types of motherboard used in computers. ● Acquire knowledge of Motherboard basics. ● Well versed in practical identification and troubleshooting of Mother Board-CPU Socket, Integrated Peripherals, Card Slots, CPU Fan Connector, and other components attached to Mother Board.
3. Chipset		5	10	After completion of this unit of module, the Learner will be able to ● Know working of Chipset. ● Physically Identify and various chipset available and technology advancement. ● Knowledge of chipset slot and socket
4. Primary and Secondary Memories		10	15	After completion of this unit of module, the Learner will be able to ● Get familiar with Memories and their types. ● Physical Identification of Primary and Secondary Memories. ● Learn about Virtual Memories, USB Flash Drive, DVD,CD etc.
5. Buses & I/O Ports		5	10	After completion of this unit of module, the Learner will be able to ● Identify various connecting ports used in desktop/laptop ● Physically identify types of Ports and Buses on the Motherboard.

14.5 Marks Distribution

Module Unit	Written Marks (Max.)
1. Power Supplies	20
2. Mother Board	25
3. Chipset	20
4. Primary and Secondary Memories	20
5. Buses & I/O Ports	15
Total	100

14.6 Detailed Syllabus

(i)   Power Supplies

Study and Application of Capacitor, Resistance, Diode, Zener Diode, Transistor, MOSFET, Introduction to Operation Amplifier IC 741 and its application as Comparators, Basic Principles and Operation of Power Supplies - Unregulated, Regulated, Linearly Regulated, Switched, Split Power Supply, Switching Supply and its Comparison w.r.t. Size, Weight, Input Voltage and Current Range and Output Voltage, Efficiency, Circuit Complexity, Applications and Cost, Power Supply Assembling and Installation, Flow Chart Preparation for Fault and Troubleshooting of Power Supply, Introduction to Power Supply Filter and Heat Sink

(ii)   Motherboard

Motherboard Definition, Study of Motherboard Form Factor – ATX, Micro-ATX, Flex ATX, ITX and Mini-ITX, Processor Socket Definition, Processor Slots Definition, its Type – Ball-Grid Array and Pin Grid Array, Study of Motherboard Components – I/O Chip, ROM BIOS, Single In Line Memory Module, Dual In Line Memory Module, Rambus In Line Memory Module (SIMM/DIMM/RIMM) Sockets, Instruction Set Architecture (ISA)/Peripheral Component Interconnect (PCI)/Accelerated Graphics Port (AGP) Bus Slots, CMOS Battery, Study of Motherboard Integrated Connectors – Audio, Video, Network Interface Card (NIC), Small Computer System Interface (SCSI),Audio Modem Raiser (AMR), Communication and Networking Raiser (CNR)

(iii)   Chipset

Chipset Definition, Study of Northbridge and Southbridge Chipset Architecture, Study of Intel Chipset for Processor Socket LGA2066 and LGA1200, Study of AMD Chipset for Processor Socket SP3r2 and SP3r3.

(iv)   Primary and Secondary Memories

Basic Principle and Operation of Memory, How Data Organization and Representation is done in Memories, Comparison between Volatile and Non-Volatile Memories and its Examples, Definition of Primary Memory and Secondary Memory, Working of RAM, ROM, Processor Register, Processor Cache, Virtual Memory, DDR2, DDR3, EPROM, EEPROM and Video Memory Secondary Memory – Working of HDD, SSD, SSHD, Optical Storage - Blue Ray, DVD, CD.

(v)   Buses & I/O Ports

Bus Definition, System and I/O Bus, its Types, Operation and Applications, Port Definition, Operations, Applications and its types - External and Internal Ports, Operation and Application of Parallel (LPT) and Serial Port (COM), Operation and Applications of Address, Data and Control Bus.

14.7 Reference Books/Study Material

1. Book Title   :   Upgrading and Repairing PCs
    Author   :   Scott Mueller
    Edition   : 22nd Edition
    Publisher   :   Que

2. Book Title   :   Modern Computer Hardware Course
    Author   :   Lotia Manahar
    Publisher   :   B P B Publications

3. Book Title   :   Computer Hardware
    Author   :   Hing Lown
    Publisher   :   Independently Published (Copy Right
                              Material of Author)

4. Book Title   :   Computer Hardware and Troubleshooting Lab
                              Guide: (Understand, Repair, Upgrade and do
                              troubleshooting your computer (PC's) yourselves)
    Author   :   G. Ganesh Shashidhar
    Publisher   :   Independently Published (Copy Right
                              Material of Author)

15. Syllabus of Peripherals and Data Storage Devices (CHMT2-R3)

15.1 Introduction to Module

This module is designed to equip incumbent with the knowledge, working and operations of various peripherals like Mouse, Keyboard, Printers and Display devices, its types. This module also provides understanding of peripherals connections with computer motherboard etc. This module also focusing on enhancing the soft skill, innovative thinking stress and problem management.

15.2 Objective

After completing the module, the incumbent will be able to:
- Understand difference between input and output devices.
- Understand operation, assembly and Disassembly of Impact and Non-Impact Printers etc along with general trouble shooting.
- Understand operation of various Electronic Display, System like Electronic Paper, LED Display, LCD Display, Flexible Display, Plasma Display etc.
- Understand diagnostic tools for problem shooting like Sys-Internals Suite, System Information for Windows (SIW) etc.
- Develop soft skills for understanding oneself, problem, stress and emotion management and development of leadership quality.

15.3 Duration

120 Hours - (Theory: 45 hrs + Practical: 75 hrs)

15.4 Outline of Module

Module Unit	Duration (Theory) in Hours	Duration (Practical) in Hours	Learning Objectives
1. **Mouse, Key Board, Printers**	10	25	After completing this unit, Learner will be able to • Know the types of Peripheral Devices. • Know the Working of Peripherals Devices and application.

				● Well versed in troubleshooting and identification of Components-Printers, Mouse, Keyboards.
2. **Display Devices and Data Storage Devices**	15	25	After completing this unit, learner will be able to ● Learn Various Display types and its operation. ● Understand working of LED, LCD, TFT. Plasma, Quantum Dot Flexible and Rollable Display. ● Online Data Storage ● Offline Data Storage ● Troubleshoot Display & Data Storage Devices	
3. **System Diagnostic Tools**	20	25	After Completion of this unit learner will be able to learn ● How to trouble shoot Computer hardware problems through software diagnostic tools ● Identification of faulty components and finally its rectification.	

15.5 Marks Distribution

Module Unit	Written Marks (Max.)
1 Mouse, Key Board, Printers	25
2 Display Devices & Data Storage Devices	40
3 Diagnostic Tools	35
Total	100

15.6 Detailed Syllabus

(i) Mouse, Key Board, Printers

Study of Basic Principle, Construction and Operation of wired and wireless Optical Mouse, wired and wireless Keyboard, Study of Printers types, principle, Construction, Operation and Application of Impact Printers – Dot Matrix and Line Printers, Non-Impact Printers - Inkjet, Laser and Multi-Function Printers.

(ii) Display Devices & Data Storage Devices

Display types and Operations of Electroluminescent Display, Electronic Paper Display, LED Display, LCD Display, TFT LCD Display, Plasma Display,

Quantum Dot Display, Flexible Display and Rollable Display. Data Storage Devices features - Volatility, Accessibility, Mutability and Addressability Online Data Storage – Cloud Storage – Google Drive, Flicker and Microsoft Sky Drive, Offline Data Storage – RAID, USB Flash Drive, Memory Card and Memory Stick. Troubleshooting of Display & Data Storage Devices.

(iii) System Diagnostic Tools

Diagnostic Tools Definition, Application of Windows OS Diagnostic Tools for Task Scheduler, Event Viewer, Shared Folder, Disk Management Services, Memory Diagnostic, Windows Defender, Windows OS Diagnostic Command for Resource, Performance and Memory – perfmon, perfmon /report and mdsched, Linux OS Diagnostic Command – htop, vmstat, iotop ,lscpu, hwinfo, lspci, lsscsi, lsusb, lsblk, fdisk and free.

15.7   Reference Books/Study Material

1.	Book Title	:	Upgrading and Repairing PCs
	Author	:	Scott Mueller
	Edition	:	22nd Edition
	Publisher	:	Que

2.	Book Title	:	Modern Computer Hardware Course
	Author	:	Lotia Manahar
	Publisher	:	B P B Publications

3.	Book Title	:	Computer Hardware
	Author	:	Hing Lown
	Publisher of Author	:	Independently Published (Copy Right Material

4.   Book Title   :   Computer Hardware and Troubleshooting Lab Guide:
(Understand, Repair, Upgrade and do troubleshooting your computer (PC's) yourselves)

Author	:	G. Ganesh Shashidhar
Publisher	:	Independently Published (Copy Right Material of Author)
Book Title	:	Personality Development and Soft Skill
Author	:	Barun K. Mitra
Publisher	:	Oxford University Press, 2nd Edition

16.   Syllabus of Computer Networking and Hardware (CHMT3-R3)

16.1 Introduction to Module

This module acquaint learner firstly with the Networking Hardware Devices like switch, Hub, Router, Bridges, RJ45 Connectors and their operations. Then learner studies Internet Architecture, OSI and TCP/IP Layer, WWW, Network Topology, Channel Access Protocol, Network Traffic and networking devices needed when designing and implementing a LAN. This module also introduces the wireless architecture like Bluetooth and gives hand on practice as how to establish a Wired and Wireless LAN in a professional manner. At the end Network diagnostic tools and command are introduced to handle and trouble shoot the Computer Networking problems.

16.2 Objectives

The objectives of this module are to make the learners understand basics of networking and hardware concepts like wires, cables, router, switches, Internet Architecture, OSI and TCP/IP, Bluetooth, Network Diagnostic Commands etc.

After completion of the module, the learner is expected to analyse the real life problem of establishing and troubleshooting Computer Networking either wired or wireless. The main emphasis of this module is to have sound knowledge of the Computer Hardware Networking Devices so that the learner will be able to establish Computer Networking in professional manner and also to trouble shoot.

- ➢ Know the various Network Hardware Devices
- ➢ Understand Internet & its uses
- ➢ Know about the Bluetooth Architecture, Protocols, Operation and Applications.
- ➢ Know how to Establishment of Computer Network
- ➢ Diagnose network problem using various Network Software and commands.

16.3 Duration

120hrs - (Theory: 45 hrs + Practical: 75 hrs)

16.4 Outline of Module

Module Unit	Duration (Theory) in Hours	Duration (Practical) in Hours	Learning Objectives

1. Network Hardware Devices	15	30	After completion of this unit of module, Learner will be able to • Understand the Computer Networking Hardware Devices • Practically use Networking Devices
2. Internet	20	20	After completion of this unit of module, Learner will be able to • Understand the Internet Architecture • Understand OSI, TCP/IP • Understand Network Topology • Understand WWW and it's working.
3.Bluetooth and Wireless Networking	5	15	After completion of this unit of module, Learner will be able to • Understand Bluetooth Architecture – PICONET and SCATTEMET • Bluetooth Layers • Establish Bluetooth Personal Area Network its operation and applications. • WLAN its types and Architecture
4.Networking Diagnostic Tools	5	10	After completion of this unit of module, candidate will be able to • Run Network Diagnostic Command • Run Network Diagnostic Software • Able to troubleshoot Network problems

16.5 Marks Distribution

Module Unit	Written Marks (Max.)
Network Hardware Devices	30
Internet	25
Bluetooth and Wireless Networking	30
Networking Diagnostic Tools	15
Total	100

16.6 Detailed Syllabus

(i) Network Hardware Devices

Introduction to Data Communication and Simplex, Half Duplex and Full Duplex Communication, Operation and Applications of Copper Wire, Aluminium Wire, Core Cable Wire (DC or Single Phase AC) and 4 Core Wire (3 Phase AC), Wires Gauge and Labelling, Operation and Application of Cables - Twisted Pair (Shielded and Non Shielded), Coaxial Cable (Thicknet and Thinnet), Optical Fiber Cables (Single and Multi-Mode), Operation and Application of Network Hardware Devices - NIC Card, Hub, Switches, Routers, Access Point, Modem and Gateway, Troubleshooting Fault Tree for Network Hardware Devices.

(ii) Internet

Definition Architecture and Working of Internet, World Wide Web (www), Internet Service Provider (ISP), Introduction of OSI and TCP/IP Model, TCP/IP, Detail Study of Network Application Layer – Architecture (Client-Server and Peer to Peer), Functions (Identifying Communication Partners, Determining Resource Availability, Synchronizing Communication), Services of Application Layer (NVT, FTAM, Addressing, Mail Services, Directory Services)Protocols in Application Layers (Telnet, FTP, TFTP, NFS, SMTP, LPD, X Windows, SNMP, DNS and DHCP with Command Practice), Detail Study of, IPv4, IPv6, IP Addressing and Subnetting in IPv4 and IPv6, Network Topology, Troubleshooting Fault Tree for Internet Connectivity.

(iii) Bluetooth and Wireless Networking

Introduction, Bluetooth Topology (PICONET, SCATTERNET), Bluetooth Architecture - Radio, Baseband, Link Management Protocol (LMP), Blue Tooth Low Energy (BLE) Definition – BLE Devices, BLE Architecture, BLE Protocol Stack and BLE Applications, WLAN Introduction, WLAN Architecture, WLAN types – WLAN, WMAN, WPAN, WWAN, WLAN Topologies – Adhoc, Infrastructure, RF, 802.11g, 802.11a, 802.11h, WLAN Benefits.

(iv) Networking Diagnostic Tools

Diagnostic Command - ping, tracert/traceroute, ipconfig/ifconfig, nslookup, netstat, Diagnostic Command for Linux - Windows Network Diagnostic Software Tool - PuTTY/Tera Term, Subnet Calculator, IP Calculator, Speed test.net Scope and Modules.

16.7 Reference Books/Study

1.	Book Title	:	Computer Network and Data Communications: Guide Question and Answer
	Author	:	Prof. Satish Jain
	Publisher	:	B P B Publication
2.	Book Title	:	Computer Network
	Author	:	Suresh Fatehpuria, Dimple Jayaswal
	Publisher	:	Genius
3.	Book Title	:	Internetworking Technology: An Engineering Perspective
	Author	:	Rahul Banerjee
	Publisher	:	Prentice Hall
4.	Book Title	:	Fundamental of Wireless Communication
	Author	:	David Tse and Pramod Viswanath
	Publisher	:	Cambridge University Press)

17. Syllabus of Working and Maintenance of Systems (CHMT4-R3)

17.1 Introduction

The module will demonstrate understanding of computer hardware covering complete eco system from desktop to laptop, microprocessor used and its technical specification, Digital Electronics, Number System, De-Morgan's Theorem, Simple combinational and sequential circuits working of BIOS, POST and booting process are covered. This module also covers working of OS and application software, its installation.

17.2 Objective

After completing the module, the incumbent will be able to:
- ➢ Knowledge of Digital Electronics, Number System, De-Morgan's Theorem
- ➢ Basic knowledge of Combinational and Sequential circuits
- ➢ Understand the hierarchy of Computer and Laptop Hardware, operation and Application of Computer.
- ➢ Knowledge of processors architecture and its operation.
- ➢ Understand the BIOS operation and Setup - CPU Configuration.
- ➢ Understand the booting process of Desktop and Laptop
- ➢ Understand the POST Test
- ➢ Knowledge of Windows and Linux OS Architecture, operation and Installation.
- ➢ Knowledge of Installation of Application Software

17.3 Duration

120Hours - (Theory: 45 hrs + Practical: 75 hrs)

17.4 Outline of Module

Module Unit	Duration (Theory) in Hours	Duration (Practical) in Hours	Learning Objectives
1. Computer Hierarchy	5	10	After completion of this unit of module, Learner will be able to ● Understand Digital Electronics, Number System, Sequential and Combinational Circuits

			● Understand different types of computers ● Understand types of OS, Application Software and its Installation.
2. Processor	10	15	After completing this unit, Learner will be able to ● Identify Processors for Workstation, Midrange, Mainframe and Supercomputer. ● Know Indian made super computer – Pratyush and Mihir ● Understand in -depth working of processor and comparison of processor based on Clock Speed, Cache etc.
3. Laptop	15	20	After completing this unit, Learner will be able to ● Understand internal operation of Laptop and its Architecture, ● Understand Hard and Soft Starting Process, ● Understand detail ACPI Specification ● Battery Charging Circuits,
4. BIOS, Booting and POST Test	5	10	After completing this unit, Learner will be able to understand ● BIOS definition, Starting BIOS, BIOS Setup - CPU Configuration. ● Working of BIOS Setup, SATA Configuration and Hardware. Health Configuration. ● BIOS and Booting Process, Security, POST Test Process
5. OS and Application Software	5	10	After completing this unit, Learner will be able to understand ● Definition and Architecture - Operating system(OS) ● Well Versed in installation of Ubuntu and Windows OS.

6. Virus Removal and Protection	5	10	After completing this unit, Learner will be able to understand • Computer Virus • Virus Types and its removal • Installation of Anti-Virus Software. • Virus Infected Identification of Computers.

17.5 Marks Distribution

Module Unit	Written Marks (Max.)
Computer Hierarchy	20
Processor	20
Laptop	30
BIOS, Booting and POST Test	10
OS and Application Software	10
Virus Removal and Protection	10
Total	100

17.6 Detailed Syllabus

(i)   Computer Hierarchy

Digital Computers - Number Systems, Binary, BCD, Hexadecimal, Grey and its conversion, Study of Logic Gates and Truth-Table, Combinational Circuit Examples - 1-Bit Half Adder, 1-Bit Subtraction, 2:1 MUX, 1:2 DEMUX Simple Clock Signal, Sequential Circuits Examples – SR Latch and SR Flip Flop, Study of Types, Operation and Application of WorkStation, Midrange Computer, Mainframe Computer and Super Computer, operating system and application software.

(ii)   Processor

Study of Specification, Electrical Properties and Application of Intel i7 Processor for Workstation, Intel i9 10980XE, AMD Ryzen3, AMD Ryzen5 Processors for Midrange Computer, Introduction to Indian Processor and its Applications – Shakti and Vega, Main and System Assistance Processor (SAP) for Mainframe Computer, Cray XC400 Parallel Multiprocessor Supercomputer, Introduction to Indian Super Computer and its Applications – Pratyush and Mihir.

(iii)   Laptop

Introduction to Laptop and its Architecture, Hard and Soft Starting Process, ACPI Specification and G(Global), D(Device), S(Sleeping) and C State of ACPI, Power and Control Signal of ACPI, Clock and Reset Circuits, Battery Charging Circuits, Fault Tree for Common Errors and Failure

(iv)   BIOS Booting and POST Test

Firmware Introduction and its Examples, BIOS, UEFI and its Comparison, Starting BIOS, BIOS Setup - CPU Configuration, SATA Configuration, USM Configuration, On Board Device Configuration, Power Management Configuration, Hardware Health Configuration, BIOS and Booting Process, Security, POST Test Process, AMI Beep Codes, Phoenix Beep Codes, Fault Tree for Common Error and Messages

(v)   OS Application

Definition and Architecture -Operating system (OS), Single, Multi-Tasking OS, Distributed OS, Embedded OS and Real Time OS, Installation of Ubuntu and Windows OS, Definition and Architecture of Application Software, Installation of Freeware Application Software from Ubuntu OS and Proprietary Application Software Installation from Windows OS, Fault Tree for Common Error and Messages.

(vi)   Virus Removal and Protection

Computer Virus Introduction, Virus Types – Malware, Trojan, Horse Worm, Spyware and Adware, Common Virus Signs – Popup Window Coming, Program Self Executing, Frequent Accounts Logout, Device Crashing, Mass Email, steps for Virus Removal – Trusted Antivirus Software, Non Clicking of unknown Popup Window, Email Scanning, File Scanning, Antivirus Software – Norton, AVG and Quick Heal Installation and Virus Protection.

17.7   Recommended Books/Study Material

1.	Book Title	:	Upgrading and Repairing PCs
	Author	:	Scott Mueller
	Edition	:	22nd Edition
	Publisher	:	Que
	ISBN-13	:	978-0789756107
	ISBN-10	:	9780789756107

2.	Book Title	:	Modern Computer Hardware Course
	Author	:	Lotia Manahar
	Publisher	:	B P B Publications
	ISBN No.	:	9788183331678

3.	Book Title	:	Computer Hardware
	Author	:	Hing Lown

Publisher : Independently Published (Copy Right Material of Author)
ISBN No. : 9781718124493

4. Book Title : Computer Hardware and Troubleshooting Lab Guide:
(Understand, Repair, Upgrade and do troubleshooting your
Computer (PC's) yourselves)
Author   : G. Ganesh Shashhar
Publisher : Independently Published (Copy Right Material of Author)
ISBN No. : 1983336319, 9781983336317

18. Syllabus of Working and Maintenance of Systems (CHMT-ES-R3)

(i) Introduction to Employability Skills

(ii) Constitutional values – Citizenship

(iii) Becoming a Professional in the 21st Century

(iv) Basic English Skills

(v) Career Development & Goal Setting

(vi) Communication Skills

(vii) Diversity & Inclusion

(viii) Financial and Legal Literacy

(ix) Essential Digital Skills

(x) Entrepreneurship

(xi) Customer Service

(xii) Getting Ready for Apprenticeship & Jobs

19. Sample Practical Assignments

19.1   CHMT1-R3 Basics of Computer Hardware

1.   How to use Digital Multi-Meter and its operation.
2.   Measurement of Resistance, Capacitance and Inductance values using Multi-Meter.
3.   How to use C.R.O. and its Operation.
4.   Measurement of Resistance, Capacitance and Inductance values using C.R.O.
5.   Measurement of Amplitude and Time of an input frequency.
6.   Verification of Ohm's Law.
7.   Measurement of Series and Parallel connected Resistance values.
8.   Measurement of Series and Parallel connected Capacitance values.
9.   Measurement of Series and Parallel connected Inductance values.
10.   Measurement of Charging and discharging voltage of capacitor with respect to time.
11.   Physical Identification of Diode, BJT Transistor and MOSFET.
12.   Identification of terminals of Diode, BJT Transistor and MOSFET using Mutli-Meter.
13.   Identification of faulty Diode, BJT Transistor and MOSFET using Mutli-Meter.
14.   Identification of faulty Diode, BJT Transistor and MOSFET using C.R.O.
15.   Full Wave Rectifier and observe output waveform on C.R.O.
16.   Perform operation of Transistor as a switch.
17.   To find out one example of each SSI, MSI and LSI VLSI ICs chips with operation of pin details from the datasheet.
18.   Design of regulated power supply with filter using IC 7805 with following specifications as
        -       Input Voltage 250V, 50Hzs and Output Voltage 5V DC
        -       Compare calculated and Measured Power delivered by Power supply.
19.   Design a SMPS power supply with filter using IC LM2576 with following specifications as
        -       Input Voltage 250V, 50Hzs and Output Voltage 5V DC
        -       Compare calculated and Measured Power delivered by Power supply.
20.   Design a Compactor for 5V using IC 741
21.   Identification of following on PC Mother Board
        -       CPU Socket
        -       CPU Fan
        -       Heat Sink
        -       SPU Fan Connector
        -       Power Connector
        -       SATA Connector
        -       DIMM Memory Slots
        -       Super IO Chip

- BIOS/UEFI Flash Chip
- North Bridge
- South Bridge
- CMOS Backup Battery
- Integrated Graphics Processor
- Integrated Audio Codec Chip
- Integrated Ethernet Chip
- PCI Slots
- Integrated Peripherals Connectors like HDMI, USB, WIFI, Audio, COM Port.
22. Disassembly and Assembly of PC SMPS Power Supply
23. Disassembly, Assembly, Windows OS Installation in Desktop PC.
24. Installation of Ubuntu Linux OS Installation in Desktop PC.
25. Installation of Dual OS with Dual Boot Facility (windows and Linux in Desktop PC.
26. Interfacing of AMD Chip set for processor socket SP3r3.

19.2 CHMT2-R3 Peripherals and Data Storage Devices

1. Disassembly, Component Identification and Assembly of 3-Button (with wheel facility) wired optical mouse.
2. Disassembly, Component Identification and Assembly of 3-Button (with wheel facility) wireless optical mouse.
3. Disassembly, Component Identification and Assembly of Dot-Matrix Printer.
4. Disassembly, Component Identification and Assembly of Ink-Jet Printer.
5. Disassembly, Component Identification and Assembly of Laser-Jet Printer.
6. Disassembly, Component Identification and Assembly of Multi-Function Printer.
7. Soldering Practice by connecting LEDs for displaying "NIELIT".
8. Pin Detail and connection of e-Paper and LED Dot-Matrix Display.
9. Pin Detail and connection of LCD and TFT Display.
10. Pin Detail and connection of Quantum Dot and Flexible Display.
11. With the help of Google Search list 05 nos of Free and Paid PC Diagnostic Tools in following Table

FREE PC DIAGNOSTIC TOOLS		
S.NO.	NAME	APPLICATION
01.		
02.		
PAID PC DIAGNOSTIC TOOLS		
S.NO.	NAME	APPLICATION
01.		
02.		

12. Pin Details and Working of following Ports

- HDMI
- USB
- WIFI
- COM
- LPT

13. Result Analysis of Diagnostic Tools and its Command for Windows OS studied in Theory Class.
14. Result Analysis of Diagnostic Tools and its Command for Ubuntu Linux OS studied in Theory Class.
15. Practical session for developing Communication skills for collaboration which are essential for Technician.
16. Practical Session for developing Successful Negotiation Skills essential for Technician.
17. Practical Session to develop confidence and skills to overcome the barriers for working efficiently and effectively.
18. Practical Session for developing the skill of working in Team.
19. Practical Session for developing the skill of Problem Management and Customer Handling.
20. Practical Session for developing the skill of Technical content writing.
21. Practical Session for developing the skill of content writing by viewing videos.
22. Practical Session for developing the skill of Leadership Quality.
23. Practical Session for developing the skill of working in Team.
24. Practical Session for developing the skill for facing Interview
25. Practical Session for developing the skill of Creative and Innovative Thinking. .

19.3 CHMT3-R3 Computer Networking and Hardware

1. Physical setup and component identification of Co-axial, UTP and Fiber Optics cables.
2. Disassembly, Component Identification and Assembly of Hub.
3. Disassembly, Component Identification and Assembly of Switch.
4. Disassembly, Component Identification and Assembly of Router.
5. Disassembly, Component Identification and Assembly of wired Access Point.
6. Disassembly, Component Identification and Assembly of Wi-Fi Access Point.
7. Practically identifying the Hardware and Software Components required for establishment of Gateways.
8. NIC Card Driver Installation for Windows OS.
9. NIC Card Driver Installation for Ubuntu OS.
10. Preparation of Cross-Over Network Cable using RJ45 Connector.
11. Preparation of Straight-Through Network Cable using RJ45 Connector
12. Setup 5(PCs) + 1(Server) wired networking using Windows Server 2000 and above and Windows OS on Client using IP and Subneting.
13. Setup 5(PCs) + 1(Server) wired networking using Ubuntu Linux Server and Ubuntu Linux OS on Client using using IP and Subneting.

14. Setup Login Credentials for accessing and sharing Internet on Windows Network Environment.
15. Setup Login Credentials for accessing and sharing Internet on Ubuntu Linux Network Environment.
16. Setup 5(PCs) + 1(Server) wifi networking using Windows Server 2000 and above and Windows OS on Client using IP and Subnetting.
17. Setup 5(PCs) + 1(Server) wifi networking using Ubuntu Linux Server and Ubuntu Linux OS on Client using IP and Subnetting.
18. Setup 5(PCs) + 1(Server) wired and wireless networking using Windows Server 2000 and above and Windows OS on Client using IP and Subnetting.
19. Setup 5(PCs) + 1(Server) wired and wireless networking using Ubuntu Linux Server and Ubuntu Linux OS on Client using IP and Subnetting.
20. Setup 5(PCs) + 1(Server) mixed of wired, wireless networking for Windows and Linux Environment in a single network using IP and Subnetting.
21. Setup Bluetooth Networking between PCs and Android Mobile Phone with resource sharing (Hardware and Software both).
22. Hands on Practice and Result Analysis of the Network Command for Windows OS studied in Class.
23. Hands on Practice and Result Analysis of the Network Command for Linux OS studied in Class.
24. With the help of Google Search list 05 nos of Free and Paid Network Diagnostic Tools in following Table

FREE NETWORK DIAGNOSTIC TOOLS		
S.NO.	**NAME**	**APPLICATION**
01.		
02.		
PAID NETWORK DIAGNOSTIC TOOLS		
S.NO.	**NAME**	**APPLICATION**
01.		
02		

25. Calculation and Comparison of the Network Speed between Windows and Linux OS on 5(PC)+1(Server) Environment.

19.4 CHMT4-R3 Working and Maintenance of Computer System

1. Download datasheet of all logic gates ICs
2. Performing AND, OR, NOT, XOR, EX-OR, EX-NOR, NAND and NOR Logical operations using Logic Gates ICs.
3. Implementation of all Logic Gates using NAND.
4. Implementation of all Logic Gates using NOR.
5. Half Adder Implementation using Logic Gates
6. Full Adder Implementation using Logic Gates.
7. Half Subtraction Implementation using Logic Gates.

8. Full Subtraction Implementation using Logic Gates.
9. Implementation of 4:1 MUX using IC 74153 using datasheet
10. Implementation of 1:4 DE-MUX using IC 74139 using datasheet.
11. Implementation of SR Latch using Logic Gates
12. Implementation of SR using Logic Gates.
13. Use of Datasheet for specification, electrical Properties and Application of Intel i7 Processor.
14. Use of Datasheet for specification, electrical Properties and Application of Intel i9 10980XE Processor.
15. Disassembly, Component Identification and Assembly of Laptop.
16. Disassembly, Component Identification and Assembly of Laptop Power Supply.
17. Disassembly, Component Identification and Assembly of Battery Charging Circuit of Laptop.
18. Formatting and Installation of Windows OS and Driver on Laptop.
19. Formatting and Installation of Ubuntu Linux OS and Driver on Laptop.
20. Installation of Dual OS (Windows and Linux Both) on Laptop.
21. Open the Laptop BIOS Setup and note down the setting and operation of following
    - CPU Configuration.
    - On Board device configuration.
    - Power Management Configuration.
    - Hardware Health Configuration.
    - Booting Process Configuration.
22. Practically identify failure of Hardware and Software component of Desktop PC during POST test and remove the failure.
23. Practically identify failure of Hardware and Software component of Laptop during POST test and remove the failure.
24. Install any Free Antivirus software in PC and check for virus infection and its removal.
25. Visit Market, Technical Institution and Industries for survey and comparison of Work Station, Laptop, Mid-Range Computer, Main Frame Computer and Super Computer in terms of specification, electrical properties, cost and Application

20. Sample Question Paper: Basics of Computer Hardware (CHMT1-R3)

TOTAL TIME: 2HOURS   **TOTAL MARKS: 100**

(Answer all the questions; each question carries ONE mark)

1. The video devices are connected to which of the following bus?
   a) PCI
   b) USB
   c) HDMI
   d) SCSI
 Ans: SCSI

2. The standards used in serial ports to facilitate communication is:
   a) RS-246
   b) RS-LNK
   c) RS-232-C
   d) Both RS-246 & RS-232-C
  Ans: RS-232-C

3. The high speed mode of operation of USB was introduced by:
   a) ISA
   b) USB 3.0
   c) USB 2.0
   d) ANSI
  Ans: USB2.0

4. For better transfer rates on the SCSI BUS the length of the cable is limited to:
   a) 2m
   b) 4m
   c) 1.3m
   d) 1.6m
  Ans: 1.6m

5. SCSI stands for _____

a) Small Computer System Interface
b) Switch Computer system Interface
c) Small Component System Interface

d) None of the mentioned

Ans: Small Computer System Interface

6. The serial port is used to connect basically _____ and processor.

a) I/O devices
b) Speakers
c) Printer
d) Monitor

Ans: I/O devices

7. IDE disk is connected to the PCI BUS using _____ interface.
a) ISA
b) ISO
c) ANSI
d) IEEE

Ans: ISA

8. _____ is an extension of the processor BUS.
a) SCSI BUS
b) USB
c) PCI BUS
d) None of the mentioned

Ans: PCI BUS

9. IDE stands for _____
a) Integrated Device Electronics
b) International Device Encoding
c) Industrial Decoder Electronics
d) International Decoder Encoder

Ans: Integrated Device Electronics

10. The BUS that allows I/O, memory and Processor to coexist is _____

a) Artibuted BUS
b) Processor BUS
c) Backplane BUS
d) External BUS

Ans: Backplane BUS

11. Which memory is necessary to refresh many times in one second?

a) Dynamic RAM
b) Static RAM
c) EPROM
d) ROM

Ans: Dynamic RAM

12. The SDRAM performs operation on -------------------
a) Rising edge of the clock
b) Falling edge of the clock
c) Middle state of the clock
d)Transition state of the clock

Ans: Rising edge of the clock

13. Which memory is on board storage?

A. Random-access memory
B. Cache memory
C. Virtual memory
D. Random Only memory
Ans: Cache Memory

14.The time taken to transfer a word or data to or from the memory is called as:
a) Access time
b) Cycle time
c) Memory latency
d)None of the above

Ans: Memory latency

15. Which type of ROM contains no Initial storage at the time of manufacturing?
a) PROM
b) EROM
c) DROM
d) Both A&B

Ans: PROM

16. Which one of the following ROM is a storage device?
a) Floppy disk
b) USB Device
c) Hard Disk
d) CD-ROM

Ans: CD-ROM

17. From where the processor can access data fastly?
a) Random-access memory
b) Cache memory
c) Registers
d) Secondary memory

Ans: Registers

18.The technology used in optical disks is:

 a) Reflective

 b) Refractive

 c) Laser beam

 d)Diffraction

 Ans: Laser Beam

19. Winchester disk are a type of:

 a) Optical disk

 b) Magnetic disk

 c) Compact disk

 d) Magnetic drives

 Ans: Magnetic disk

20. The process in which a file is partitioned into smaller parts and different parts are stored in different disks is _____
a) RAID
b) Mirroring
c) Stripping
d) RAID classification

Ans: Stripping

21. Which of the following is not a magnetic disk?
a) Floppy
b) Winchester
c) Zip
d) FLASH

Ans: Flash

22. The unattended interactive information systems such as automatic teller machine or ATM is called as _____
a) Kiosks
b) Sioks
c) Cianto
d) Kiaks

Ans: Kiosks

23. Which of the following is not a SSD device?

 a) Mother board
b) Integrated circuit
c) Hard disk
d) Flash memory

Ans: Hard disk

24. When was first SSD (Solid State Drive) made?

a) 1976
b) 1978
c) 1945
d) 1947

Ans:1976

25. Which of the following RAM require slowest response time?

a) SRAM

b) DRAM

c) EDORAM

d)None of the above

Ans: SRAM

26. The AGP slot is designed for what component?

a) Video Cards

b) Sound cards

c) Keyboard connection

d) Ethernet connection

Answer: Video Cards

27. What does Intel plan to replace with the PCI-Express?

a) AGP

b) PCI

c) North Bridge/South Bridge

d) All of the above

Answer: All of the above

28. What year did Intel first release the AGP slot for use in its own systems?

a) 1995

b) 1997

c) 1998

d) 2000

Answer: 1997

29. Which one of the following is a component on NIC?
a) Resistors

b) Capacitors

c)Diodes

d)All of the above

Ans: All of the above

30. Which one of the following is also known as fast Ethernet?

a)5 Base T

b)10 Base T

c)100 Base T

d) None of the above

Ans: 100 Base T

31.The Ethernet network interface card is characterised into how many types?

a) Two

b) Three

c)Four

d)Five

Ans: Four

32. Which one of the following is considered as 1000Base T Ethernet?

a) 5 Base T

b)10 Base T

c)100 Base T

d)Gigabit Ethernet

Ans: Gigabit Ethernet

33. Which one of the following is a basic function of network interface card?

 a) Data transfer

 b) Encapsulation

 c)Buffering

 d)All of the above

  Ans: All of the above

34.Which one of the following is a part of ATX form factor?

 a) Mini-ITX

 b) MacroATX

 c)Micro ATX

 d) PicoATX

  Ans: MicroATX

35. Which one of the following output voltage cannot be provided by the ATX 12V 2.0 P1 connector?

 a) +5V

 b) +3.3V

 c)-3.3v

 d)12v

 Ans: -3.3v

36. The minimum amount of current that must pass through the Zener diode in order to drive Zener diode into the reverse breakdown condition is called:

a) Threshold current

b) Knee current

c)Holding current

d)None of the above

Ans: Knee current

37. In which region the Zener diode must be operated in order to make it work as a voltage regulator?

a) Active region

b) Saturation region

c)Reverse bias region

d)Reverse breakdown region

Ans: Reverse breakdown region

38. What happens to the depletion width when a given diode is operated in a reverse biased region?

a) Increases

b) Decreases

c)Remains same

d)None of the above

Ans: Increases

39.The condition at which the entire base region of a transistor is occupied by the depletion width on application of reverse bias voltage is called:

a) Channel breakdown

b) Source breakdown

c)Punch through

d)None of the above

Ans: Punch through

40. What is the threshold voltage of a Silicon diode?

a)0.2V

b)0.7V

c)1.1v

d)None of the above

Ans:0.7V

41. OPAMP is also called as:

a) Feedback amplifier

b) Differential amplifier

c)Low-gain amplifier

d)None of the above

Ans: Differential amplifier

42. The input impedance of an ideal OPAMP is:

 a) Infinite

 b) Very High

 c) Very low

 d) Zero

Ans: Infinite

43. What is the type of feedback when OPAMP is used as an oscillator?

a) Positive feedback

b) Negative feedback

c)Buffer state

d)None of the above

Ans: Positive feedback

44.Which of the following is not a part of D.C power supply?

 a) Load Resistance

 b) Filter

c)Regulator

d) Diode

Ans: Load resistance

45. Automatic switching OFF function is accomplished in MCB by:

a) Relay

b) Clutch

c) Bimetallic strip

d) Diode

Ans: Bimetallic strip

46. The working of SMPS is based on:

a) Integral control principle

b) Frequency control principle

c)Chopper principle

d)Phase control principle

Ans: Chopper principle

47.The most suitable for high-frequency inversion in SMPS is:

 a) BJT

 b) IGBT

c)MOSFET

d)GTO

Ans: MOSFET

48.The disadvantage of SMPS over conventional linear power supply is:

 a) Low efficiency

 b) Bulky components

 c)Generates strong electromagnetic field

 d) Low cost

Ans: Generates strong electromagnetic field

49.Switch mode power supply is used for:

a) Obtaining controlled DC supply

b) Switching over from one supply to another

c) Obtaining AC voltages at higher frequencies

d) Obtaining AC voltages at lower frequencies

Ans: Obtaining controlled DC supply

50.Which of the following is the main advantage of SMPS over linear power supply?

a) No transformer is required

b) No filter is required

c)Higher efficiency

d)One stage conversion

Ans: Higher efficiency

51. Which of the following provides the fastest data access time –

a) RAM
b) ROM
c) SCSI
d) Hard Drive

52. Which of the following component is active first during the normal pc booting –

a) RAM BIOS
b) CMOS
c) CPU
d) ROM BIOS

53. The computer has two type of memories 'RAM' & 'ROM' they are part of –

a) Backup memory
b) Main memory
c) Storage memory

d) Long-term memory

54. Which of the following devices has converted AC to DC line –

a) DVD
b) Adapter
c) RAM
d) SMPS

55. Which of the following chip are interconnection between most of the input/output devices and the CPU –

a) North Bridge
b) RAM
c) ROM
d) South Bridge

56. Where are the expansion cards are inserted into the computer–

a) Slots of CPU
b) Peripheral devices
c) Hard Disk of CPU
d) Back of monitor

57. SCSI stands for –
a) System Computer Scanning Interface
b) Small Computer System Interface
c) Small Computer System Internet
d) System Computer System Interfaced

58. A pc has 2 SCSI internal hard drives, where do you connect the second hard drive –

a) Any open SCSI port on the pc
b) A serial port on the pc
c) An open parallel port on the pc
d) An open SCSI port on the primary disk drive

59. Which of the following motherboard form factor uses 20 pin connector –

a) ATX
b) AT
c) Baby AT
d) All of the above

60. _____ connects the computer to the network media.

a) cable
b) hub
c) NIC
d) terminator

61. Where does the motherboard store the keyboard controller support program?

a) DRAM
b) hard drive
c) RAM
d) ROM chip

62. The IC chip used in computers is made of

a) Chromium
b) Iron Oxide
c) Silica
d) Silicon

63. Which of the following is called as memory controller Hub –

a) South Bridge
b) RAM
c) North Bridge
d) CPU

64. ___ is the highest speed memory used in the computer –

a) Ram
b) Hard Disk
c) Cache
d) BIOS

65. EEPROM stands for –

a) Electronically Erasable Programmable Read-Only Memory
b) Electrically Erasable Programmable Read-Only Memory
c) Electrically Enabled Programmable Read-Only Memory
d) Electronically Enabled Programmable Read-Only Memory

66. Which register holds the actual instruction being executed currently by the computer?

(a) Memory address register (MIR)
(b) Instruction register (IR)
(c) Memory data register (MDR)
(d) Program counter register

67. Which memory is non-volatile and may be written only once?

   a) RAM
   b) EEPROM
   c) EPROM
   d) PROM

68. Which of the following memory is non-volatile?

   e) SRAM
   f) DRAM
   g) ROM
   h) All of the above

69. The basic architecture of computer was developed by

   a) John Von Neumann
   b) Charles Babbage
   c) Blaise Pascal
   d) Garden Moore

70. Storage which stores or retains data after power off is called-

   a) Volatile storage
   b) Non-volatile storage
   c) Sequential storage
   d) Direct storage

71. Which of the following memories must be refreshed many times per second?

   a) EPROM
   b) ROM
   c) Static RAM

d) Dynamic RAM

72. Magnetic tape is not practical for applications where data must be quickly recalled because tape is _____.

    a) A random-access medium
    b) A sequential-access medium
    c) A read-only medium
    d) An expensive storage medium

73. Typical acronym of reusable optical storage will be

    a) CD
    b) CD-RW
    c) DVD
    d) RPM

74. The faster, costlier and relatively small from of storage managed by computer system hardware is:

    a) Main Memory
    b) Flash Memory
    c) Cache
    d) Disk

75. Main memory works in conjunction with _____.

    a) RAM
    b) CPU
    c) Graphics card
    d) LAN

76. SRAM stands for-

    a) Special Random-Access Memory
    b) Supreme Random-Access Memory
    c) Static Random-Access Memory
    d) Stable Random-Access Memory

77.. SRAM stands for-

    e) Special Random-Access Memory

    f) Supreme Random-Access Memory

    g) Static Random-Access Memory

    h) Stable Random-Access Memory

78. Total parallel capacitance is less than that of the smallest capacitor in parallel.

    a) True

    b) False

79. When the voltage across a capacitor is tripled, the stored charge

    a) Triples

    b) Is cut to one-third

    c) Stays the same

    d) Doubles

80. A 0.00022 F capacitor equals how many microfarads?

    a) 22 μF

    b) 220 μF

    c) 2,200 μF

    d) 22,200 μF

81. Which type of memory can speed up computer processing?

    a) ROM

    b) Cache memory

    c) Registers

    d) Both A & B

82. From where the processor can access data fastest?

    a) Random-access memory

    b) Cache memory

    c) Registers

    d) Secondary memory

83. The Boot sector files of the system are stored in which computer memory?

(a) RAM

(b) ROM

(c) Cache
(d) Register

84. Which of the following statements are not correct about the main memory of a computer?

(a) In main memory, data gets lost when power is switched off.
(b) Main memory is faster than secondary memory but slower than registers.
(c) They are made up of semiconductors.
(d) All are correct

85. Which of the following is the lowest in the computer memory hierarchy?

(a) Cache
(b) RAM
(c) Secondary memory
(d) CPU registers

86. Which process is used to map logical addresses of variable length onto physical memory?

(a) Paging
(b) Overlays
(c) Segmentation
(d) Paging with segmentation

87. PS2 and USB are examples of Logical Ports

a) True
b) False

88. Physical ports are usually referred to as _____
a) jacks
b) cables
c) **interfaces**
d) hardware plugs

89. Logical ports are also known as _____
a) numbered ports
b) virtual numbering
c) **virtual ports**
d) network protocol ports

90. Which of the following is the port number for FTP data?
a) 20

b) 21

c) 22

d) 23

91. HTTP is _____ protocol.

a) **application layer**

b) transport layer

c) network layer

d) data link layer

92. In FTP protocol, a client contacts a server using _____ as the transport protocol.

a) **Transmission control protocol**

b) User datagram protocol

c) Datagram congestion control protocol

d) Stream control transmission protocol

93. A semiconductor has generally ……………… valence electrons.

    a) 2

    b) 3

    c) 6

    d) 4

94. When a pure semiconductor is heated, its resistance ………….

    a) Goes up

    b) Goes down

    c) Remains the same

    d) Can't say

95. In an unregulated power supply, if input a.c. voltage increases, the output voltage …….

    a) Increases

    b) Decreases

    c) Remains the same

    d) None of the above

96. A Zener diode utilises ………… characteristic for voltage regulation

    a) Forward

b) **Reverse**
c) Both forward and reverse
d) None of the above

97. An oscillator produces……………. oscillations
   a) Damped
   b) **Undamped**
   c) Modulated
   d) None of the above

98. The piezoelectric effect in a crystal is ……………
   a) **A voltage developed because of mechanical stress**
   b) A change in resistance because of temperature
   c) A change in frequency because of temperature
   d) None of the above

99. In any linear network, the elements like inductor, resistor and capacitor always_____
a. Exhibit changes due to change in temperature
b. Exhibit changes due to change in voltage
c. Exhibit changes due to change in time
d. **Remains constant irrespective of change in temperature, voltage and time**

100. For an Op-amp with negative feedback, the output is …….
   a) equal to the input
   b) increased
   c) **feed back to the inverting input**
   d) feed back to the noninverting input

21. Sample Question Paper: Peripheral and Data Storage Devices (CHMT2-R3)

TOTAL TIME: 2HOURS   **TOTAL MARKS: 100**

(Answer all the questions; each question carries ONE mark)

1. There are _____ layers are present in modern key board
a) 1
b) 2
c) 3
d) 4

 Ans: 3

2. In a keyboard, when we press a key, internally it
a) Completing a circuit and allowing a tiny amount of current to flow through
b) Open a circuit and allowing a tiny amount of current to flow through
c) Close a circuit and allowing a tiny amount of current to flow through
d) None of the above

 Ans: Completing a circuit and allowing a tiny amount of current to flow through

3. Which of the following groups are only input devices?
a) Mouse, keyboard, monitor
b) Mouse, keyboard, printer
c) Mouse, keyboard, Speaker
d) Mouse, keyboard, Touch Screen

 Ans: Mouse, keyboard, Touch Screen

4. _____ is used to detect optical mouse motion
a) Light sensor
b) Rollers
c) Mechanical sensor
d) Electrical circuit

Ans: Light sensor

5. Which of the following mouse contain a ball on its underside and sensors to detect direction of ball movement?
   a) Mechanical Mouse
   b) Opto- mechanical Mouse
   c) Optical Mouse

   d) None of these

Ans: Opto- mechanical Mouse

6. Cordless mouse connects to the computer through
a) Optical Fiber
b) Radio wave
c) Ultrasound wave
d) None of these

Ans: Radio wave

7. Speed of a dot matrix printer is measured in
a) LPM
b) PPM
c) DPI
d) DPS

Ans: DPI

8. Microphone has a
a) Electric to acoustic sensor
b) Acoustic to electric sensor
c) Acoustic to sound sensor
d) Sound to acoustic sensor

Ans: Acoustic to electric sensor

9. What allows you to print on both sides of the printer
a) Fuser
b) Duplexer
c) Toner
d) Paper swapping unit

Ans: Paper swapping unit

10. What do we use to measure the speed of a dot matrix printer?
a) Dots per inch
b) Lines per sheet

c) Characters per Inch
d) Characters per second

Ans: Dots per inch

11. Daisy wheel printer is a type of
a) Matrix printer
b) Impact printer
c) Laser printer
d) Non-impact printer

Ans: Impact printer

12. A dot matrix printer (i) prints an entire line at time (ii) is a non-impact printer (iii) allows multiple copies to be taken at a time (iv) prints one character at a time
a) (i) & (ii)
b) (i) & (iii)
c) (iii) & (iv)
d) (ii) & (iii)

Ans: (iii) & (iv)

13. A Line printer (i) prints an entire line at time (ii) is a non-impact printer (iii) allows multiple copies to be taken at a time (iv) prints one character at a time
a) (i) & (ii)
b) (i) & (iii)
c) (iii) & (iv)
d) (ii) & (iii)

Ans: (i) & (iii)

14. _____ Printer has tiny nozzles
a) LASER
b) Inkjet
c) Dot Matrix
d) Line Printer

Ans: Inkjet

15. _____use an electrical charge to attract toner particles to a transfer roller
a) LASER
b) Inkjet
c) Dot Matrix
d) Line Printer

Ans: LASER

16. _____ uses pressure and heat to fuse the toner powder onto the paper.
a) Photoelectric Drum
b) Cleaning blade
c) Fuser Roller
d) Pressure valve

Ans: Fuser Roller

17. Printer in which printing head and paper is forced together to form the letters is called
a) Impact printer
b) Non-Impact printer
c) 3D printer
d) Nozzle Head Printer

Ans: Impact printer

18. Why is the print drum given a negative charge?
a) To attract the toner to every area of the drum
b) To attract the toner to the areas of the drum that have a stronger negative charge
c) **To attract the toner to the areas of the drum that have a weaker negative charge**
d) To attract the positively charged paper to the print drum

Ans: To attract the toner to the areas of the drum that have a weaker negative charge

19. What allows you to print on both sides of the printer
a) Fuser
b) Duplexer
c) Paper Swapping Unit
d) Toner

Ans: Paper Swapping Unit

20.   Spead of Laser Printer is measured in
a) Ppm
b) Dpi
c) Cpm
d) lpm

Ans: ppm

21.   The full form of LCD is _____
a) Liquid Crystal Display
b) Liquid Crystalline Display
c) Logical Crystal Display
d) Logical Crystalline Display

Ans. Liquid Crystal Display

22.   The optical properties of liquid crystals depend on the direction of _____
a) Air
b) Solid
c) Light
d) Water

Ans. Light

23.   By which properties, the orientation of molecules in a layer of liquid crystals can be changed?
a) Magnetic field
b) Electric field
c) Electromagnetic field
d) Gallois field

Ans. Electric field

24.   The first LCDs became commercially available in _____
a) 1950s
b) 1980s
c) 1960s
d) 1970s

Ans. 1960s

25.   LCDs operate from a frequency ranges from _____
a) 10Hz to 60Hz
b) 50Hz to 70Hz
c) 30Hz to 60Hz
d) None of the Mentioned

Ans.30Hz to 60Hz

26. The maximum number of points that can be displayed without an overlap on a display screen is called
a)   Dots per inch

b) Resolution
c) Aspect ratio
d) Pixel Pitch

 Ans. Resolution

27.   A light emitting diode is _____
a) Heavily doped
b) Lightly doped
c) Intrinsic semiconductor
d) Zener diode

Ans. Heavily doped

28.   Which of the following materials can be used to produce infrared LED?
a) Si
b) GaAs
c) CdS
d) PbS

Ans. GaAs

29.   What is the bandwidth of the emitted light in an LED?
a) 1 nm to 10 nm
b) 10 nm to 50 nm
c) 50 nm to 100 nm
d) 100 nm to 500 nm

Ans. 10 nm to 50 nm

30.   Which process of the Electron-hole pair is responsible for emitting of light?
a) Generation
b) Movement
c) Recombination
d) Diffusion

Ans. Recombination

31.   Plasma Monitor is suitable for _____?
a) Large Display
b) Small Display
c) Display of mobile phones
d) Display of watches

Ans. Large Display

32.   TFT Stands for
a) Tiny Film Transistor
b) Thin Film Transistor
c) Thin Floppy Transistor
d) Thin Film Transmission

Ans. Thin Film Transistor

33.   Quantum dots can be used in _____
a) Crystallography
b) Optoelectronics
c) Mechanics
d) Quantum physics

Ans. Optoelectronics

34.   How do the hard disks record information?

a) Propagation
b) Magnetization
c) Centrifugation
d) Gravitation

 Ans. Magnetization

35.   In _____ storage device the access time is effectively independent of the location of data.

a) Primary storage
b) Secondary storage
c) Direct access
d) Indirect access

Ans. Direct access

36.   In _____ storage device the access time is effectively independent of the location of data.

a) Primary storage
b) Secondary storage

c) Direct access

d) Indirect access

Ans. Direct access

37.   Which of the following system does not has provision storage to most users?

a) PaaS

b) IaaS

c) CaaS

d) SaaS

Ans.IaaS

38.SSD uses this based fash memory

a) AND

b) NAND

c) XOR

d) XNOR

 Ans. NAND

39.   Which of the following storage option is available for managed storage?

a) formatting

b) partitioning

c) replicating data

d) all of the mentioned

Ans. all of the mentioned

40.   What   is   Cloud   Computing?

a) Cloud Computing means providing services like storage, servers, database, networking, etc

b)   Cloud   Computing   means   storing   data   in   a   database

c)   Cloud   Computing   is   a   tool   used   to   create   an   application

d) None of the mentioned

Ans. Cloud Computing means providing services like storage, servers, database, networking, etc

41.   Which of the following is not a type of cloud server?

a) Public Cloud Servers

b) Private Cloud Servers

c) Dedicated Cloud Servers

d) Merged Cloud Servers

Ans. Merged Cloud Servers

42.   Which of the following is an example of the cloud?
a) Amazon Web Services (AWS)
b) Dropbox
c) Cisco WebEx
d) All of the above

Ans. All of the above

43.   Which RAID type doesn't use parity for data protection?
a) RAID 1
b) RAID 4
c) RAID 6
d) RAID 5

Ans. RAID 1

44. What is the minimum number of disks required for RAID1?
a) 1
b) 2
c) 4
d) 5

Ans.2

45. 480Mbps of operation of USB is done by _____
a) ISA
b) USB 3.0
c) USB 2.0
d) ANSI

Ans. USB 2.0

46. The USB device follows _____ structure.
   a) List
   b) Huffman
   c) Hash
   d) Tree

Ans. Tree

47. A hard disk is divided into tracks which are further subdivided into
a) Cluster
b) Sector

c) Vector

d) Head

Ans. Sector

48. Which of the followings have fastest access time?

a) SSD

b) magnetic disk

c) magnetic drive

d) optical disk

Ans. SSD

49. The ALU of a computer response to the commands coming from

a) Primary memory

b) External Memory

c) Cache Memory

d) Control Section

Ans: Control Section

50. What is the meaning of RAID?

a) Redundancy Array of the Independent Disk

b) Redundancy Array of the Interdependent Disk

c) Redundancy Array of the Interdependent Disk

d) Redundancy Array of the Inversion Disk

Ans. Redundancy Array of the Independent Disk

51. The information about all files is kept in _____

a) operating system

b) separate directory structure

c) swap space

d) none of the mentioned

Ans: separate directory structure

52. To recover from failures in the network operations _____ information may be maintained.

a) operating system

b) ip address

c) stateless

d) state

Ans: state

53. On systems where there are multiple operating system, the decision to load a particular one is done by _____
    a) process control block
    b) file control block
    c) boot loader
    d) bootstrap

Ans: boot loader

54. The two steps the operating system takes to use a disk to hold its files are _____ and _____
    a) caching & logical formatting
    b) logical formatting & swap space creation
    c) swap space creation & caching
    d) partitioning & logical formatting

Ans: partitioning & logical formatting

55. The _____ program initializes all aspects of the system, from CPU registers to device controllers and the contents of main memory, and then starts the operating system.
    a) bootstrap
    b) main
    c) bootloader
    d) rom

Ans: bootstrap

56. What is an operating system?
    a) interface between the hardware and application programs
    b) collection of programs that manages hardware resources
    c) system service provider to the application programs
    d) all of the mentioned

Ans: all of the mentioned

57. CPU scheduling is the basis of _____
    a) multiprogramming operating systems
    b) larger memory sized systems
    c) multiprocessor systems
    d) none of the mentioned

Ans: multiprogramming operating systems

58. Which one of the following errors will be handle by the operating system?
    a) lack of paper in printer
    b) connection failure in the network
    c) power failure
    d) all of the mentioned

Ans: all of the mentioned

59. If a process fails, most operating system write the error information to a _____
    a) new file
    b) another running process
    c) log file
    d) none of the mentioned

Ans: log file

60. The operating system is responsible for?
    a) bad-block recovery
    b) booting from disk
    c) disk initialization
    d) all of the mentioned

Ans: all of the mentioned

61. Whenever a process needs I/O to or from a disk it issues a _____
    a) system call to the operating system
    b) a special procedure
    c) system call to the CPU
    d) all of the mentioned

Ans: system call to the operating system

62. In SCSI disks used in high end PCs, the controller maintains a list of _____ on the
    disk. The disk is initialized during _____ formatting which sets aside spare sectors
    not visible to the operating system.
    a) destroyed blocks, partitioning
    b) bad blocks, low level formatting
    c) destroyed blocks, high level formatting
    d) bad blocks, partitioning

Ans: bad blocks, low level formatting

63. Linux is an(a) ………………. Operating system.

a) Open source
b) Microsoft
c) Windows
d) Mac

Ans: Open source

64. Which of the following is suitable after you install new drivers?
a) Shut Down
b) Restart
c) Sleep
d) Hibernate

Ans: Restart

65. When you start up the computer the boot up storage at which the BIOS versions manufacturer and data are displayed on the monitor is called
a) Bootstrap
b) Power on self-test (POST)
c) System configuration
d) Kernel loading

Ans: Power on self-test (POST)

66. Which one of the following is not a multitasking operating system?
a) DOS
b) Windows
c) Unix
d) Linux

Ans: DOS

67. The Command do you use to create Linux file system is ....
a) fsck
b) mkfs
c) mount
d) None of the mentioned

Ans: mkfs

68. Which of the following directory contains configuration files in Linux?

a) /dev/
b) /etc/
c) /bin/
d) /root/

Ans: /etc/

69. If there are multiple recycle bin for a hard disk
a) You can set different size for each recycle bin
b) You can choose which recycle bin to use to store your deleted files
c) You can make any one of them default recycle bin
d) None of above

Ans: You can set different size for each recycle bin

70. If the displayed system time and date is wrong, you can reset it using
a) Write
b) Calendar
c) Write file
d) Control panel

Ans: Control panel

71. Which of the key is used to close the active window?
a) Ctrl+F4
b) Ctrl+F5
c) Alt+F4
d) None of above

Ans: Alt+F4

72. Which is the default file system type of Linux.
a) etx
b) Mimix
c) NTFS
d) FAT

Ans: etx

73. The shortcut key to open a task manager is:
a) Alt + F1
b) Alt + Ctrl + Delete
c) Alt + Tab

d) F1

Ans: Alt + Ctrl + Delete

74. The windows feature is the ability of computer to automatically configure a new hardware component is that
a) Auto detect
b) Plug and play
c) Add remove hardware
d) None of above

Ans: Plug and play

75. Which of the following does not support more than one program at a time?
a) DOS
b) Linux
c) Windows
d) Unix

Ans: DOS

76. Poor expressions, wrong gestures, nuclear presentations can be termed as
a) Difficulties in communication
b) Encoding errors
c) Barriers in communication
d) Decoding errors

Ans: Barriers in communication

77. Communication is valid in the form of
a) Non-verbal messages
b) Written messages
c) Verbal messages
d) All of these

Ans: Written messages

78. A systematic, well organized document listing analysis or problem and suggestions or ideas to achieve
a) A Report
b) Internal communication
c) Instructions
d) Feedback

Ans: A Report

79. Ability to do what needs to be done, without influence of other people or situations can be particularly termed as
a) Motivation
b) Self-motivation
c) Confidence
d) None of these

Ans: None of these

80. Personal letter does not include_____.
a) Salutation
b) Qualification
c) Heading
d) Body of letter

Ans: Qualification

81. One to one communication is complete when
a) A receiver receives the message
b) A receiver responds after understanding the message
c) A sender sends a message
d) Both sender and receiver interchange4 the roles continuously

Ans: A receiver responds after understanding the message

82. The dialogue or exchange of words and ideas among peer is
a) Lateral communication
b) Internal communication
c) Upward communication
d) Downward communication

Ans: Lateral communication

83. By which of the following way one can combat stress?
a) Relaxation exercises
b) Negative attitude
c) Unbalanced approach
d) All of these

Ans: Relaxation exercises

84. A crucial parameter for professional success, this is not dependent on outside factors like finance, experience, education etc.
a) Self-awareness
b) Self-analysis
c) Self-motion
d) None of these

Ans: None of these

85. A two-way process including meetings, conferences, teleconferencing, multimedia presentations, group discussions are examples of
a) Social communication
b) Interactive communication
c) mass communication
d) Formal communication

Ans: Formal communication

86. A clear perception of own personality traits like strengths, weakness, thoughts, benefits, motivation, and emotions can be referred as
a) Self-awareness
b) Self-analysis
c) Self-esteem
d) Self-respect

Ans: Self-awareness

87. Personality can be defining as
a) Combination of different skill and physical appearance
b) Unique and persistent qualities is an individual
c) Overall actions of a person
d) All of these

Ans: All of these

88. Worrying excessively about the past or the future is the sign of _____.
a) Self-doubt
b) Self-analysis
c) Negative Tendency & low self-esteem
d) Good self-esteem

Ans: Negative Tendency & low self-esteem

89. Code of behaviour in accordance with socially acceptable norms are also referred as
Obligation
a) Social status
b) Etiquettes
c) None of these

Ans: Etiquettes

90. Irritability, aggressiveness, depression, loss of sense of humor or assertiveness are sign of
a) Self-doubt
b) Low self-efficacy
c) Disinterest
d) Stress

Ans: Stress

91. The basic purpose of any communication includes
a) Persuasion
b) Motivation
c) Instruction
d) All of these

Ans: All of these

92. Advantage of time management include
a) Confusion
b) Stress
c) Higher motivation
d) None of these

Ans: Higher motivation

93. A continuous positive thought process to achieve something worthwhile can be defined in one word as
a) Strength
b) Appearance
c) Motivation
d) Personality

Ans: Higher motivation

94. The positive words like please; Thank you; you're welcome etc. are considered as_____.
a) Effective communication
b) High self-efficacy
c) Good etiquettes
d) Good presentation

Ans: Good etiquettes

95. Reviewing the dialogue before winding up to get a clear understanding between communicating parties is called as
a) Reinforcement
b) Summarizing
c) Closing
d) Agreement

Ans: Summarizing

a) Which of the following quality does not include in positive self- esteem person?
b) Always blaming behaviour
c) Positive thoughts
d) Self-motivation
e) Ability to say No

Ans: Always blaming behaviour

96. To improve self-esteem _____is important
a) Timer Management
b) Positive Outlook
c) Self-Motivation
d) All of these

Ans: Positive Outlook

97. Which of the following is not a way to maintain a coordinal relationship?
a) Negative Attitude
b) Be a patient listener
c) Talk politely
d) Give and take respect

Ans: Negative Attitude

98. The non-verbal responses like nodding the head, clapping or smiling at appropriate time is categorized as

a) Positive feedback
b) Negative feedback
c) Confusing feedback
d) Neutral feedback

Ans: Positive feedback

99. Lip licking, Lip biting or nail biting conveys the gesture of
a) Confusion
b) Nervousness
c) Confidence
d) Anger

Ans: Nervousness

100.   The public speaking through interactive communication is
a) formal communication
b) social interaction
c) a presentation
d) professional communication

Ans: a presentation

22. Sample Question Paper: Computer Networking and Computer Hardware (CHMT3-R3)

TOTAL TIME: 2HOURS   **TOTAL MARKS: 100**

(Answer all the questions; each question carries ONE mark)

1. A _____ can be defined as an electronic machine that accepts information (data + instructions) from an input device, process it and send the information to output device.
   a) computer
   b) calculator
   c) smartphone
   d) camera
2. Data can be any information that needs to be processed to get a specific output (result).
   a) modified
   b) processed
   c) added
   d) rectified
3. The set of all instructions is called a _____
   a) command
   b) logic
   c) computer
   d) program
4. A computer can _____, _____, _____ , _____ and _____.
   a) store data, accept data, retrieve data, print data, process data
   b) accept data, store data, retrieve data, print data, process data
   c) store data, accept data, retrieve data, process data , print data
   d) Accept data, store data, process data, retrieve data, print data,
5. Computers are classified in a variety of ways depending upon the principles of _____
   a) working
   b) applications
   c) construction and size
   d) All of these
6. _____ computers are widely used for variety of applications across the globe,and are least powerful as compared to other computers
   a) Super Computer
   b) Mainframe Computers
   c) Mini Computers
   d) Micro Computers

7. The computers that process _____ signals are known as Analog Computers
   a) analog
   b) digital
   c) signum
   d) parabolic
8. An digital signal can be represented as a series of _____
   a) saw tooth wave
   b) square wave
   c) sign wave
   d) spin wave
9. The analog signal can have infinite values over the continuous wave
   a) finite
   b) unknown
   c) infinite
   d) numerous
10. The _____ are widely used in the construction of analog computers when the analog electrical signal is to be processed.
    a) Transistors
    b) Integrated circuits
    c) operational amplifiers
    d) none of these
11. _____ Computers process digital signals.
    a) analog
    b) digital
    c) Both
    d) None of these
12. The Digital signal is a discrete signal with two states _____ and ____
    a) 1,2
    b) 0,1
    c) 1, 7
    d) 1, 9
13. Examples of _____ are personal computers, supercomputers, mainframe computers etc
    a) digital computers
    b) analog computers
    c) calculator
    d) hybrid computers
14. _____ are the most powerful computers in terms of speed of execution
    a) DESKTOP
    b) supercomputers
    c) mainframe computers

d) pamtop

15. _____ was the first super computer made in India by C-DAC
a) Trishul
b) Pruthvi
c) Param
d) Eniac

16. The _____ computers are multi-terminal Computers
a) laptop
b) personal
c) mini
d) mainframe

17. Unlike personal computers, _____ computers offer time-sharing.
a) mini
b) super
c) mainframe
d) pamtop

18. _____ computers are also known as midrange computers
a) mini
b) mainframe
c) pcs
d) palmtop

19. As compared to _____ mainframes and minicomputers, microcomputers are the least powerful
a) micro Computers
b) computers
c) super Computers
d) mini Computers

20. _____ is the term referred to the computer that is designed for use by a single person
a) Mainframe computer
b) mini computer
c) super Computers
d) personal computer

21. _____ are sometimes called microcomputers
a) PCs
b) minis
c) mainframes
d) super computers

22. The term _____ is frequently used to refer to desktop computers.
a) laptop
b) handheld computers

c) palmtop

d) PCs

23. _____ comprises of a keyboard, mouse, monitor and system unit.
    a) laptop
    b) handheld computers
    c) Desktop
    d) palmtop

24. The _____ is also known as cabinet or chassis.
    a) motherboard
    b) system unit
    c) cpu
    d) monitor

25. Desktop computers come in two models- horizontal model and _____.
    a) vertical model
    b) flat model
    c) right model
    d) tower model

26. The size of a _____ is like an appointment book.
    a) Palmtop
    b) laptop
    c) Tablet computer
    d) desktop computer

27. The palmtops are generally kept for _____ such as taking notes, developing a list of friends, keeping track of dates, agendas etc.
    a) Public use
    b) Personal use
    c) Mass use
    d) Common use

28. there are four main building blocks in a computer's functioning - Input, Processor, Output and Memory.
    a) Input, Processor, Output and printer.
    b) Input, Processor, printer and Memory.
    c) Input, Processor, Output and Memory.
    d) memory, Processor, Output and monitor

29. The _____ controls and manipulates the data
    a) Mouse
    b) Monitor
    c) printer
    d) CPU

30. The processed data is either stored in the _____ or sent to the output device

a) hard disk
b) memory
c) pen drive
d) CD

31. The _____ unit holds data and program instructions for processing data
    a) hard disk
    b) pen drive
    c) memory
    d) CD

32. _____ translate the processed information from the computer into a form that we can understand.
    a) input devices
    b) memory
    c) processor
    d) Output devices

33. This is the process of entering data and programs into the computer
    a) system input
    b) input device
    c) process
    d) computing

34. _____ accept the command or input in a language used by the user like English and converts the same into machine language
    a) Input devices
    b) memory
    c) processor
    d) Output devices

35. The process of input, output, processing and storage is performed under the supervision of a unit called _____ .
    a) Arithmetic Logic unit
    b) Control Unit
    c) co-processor
    d) memory management unit

36. This is the storage area of a computer.
    a) memory
    b) hard disk
    c) floppy disk
    d) cd rom

37. There are two categories of memory namely a _____ memory and _____
    a) volatile, non-volatile
    b) DDR2, DDR3

c) Fast, slow

d) ROM, EPROM

38. all number crunching or logical operations are performed by the _____.
    a) CU
    b) Memory
    c) ALU
    d) storage

39. The _____ and the _____ of a computer system are jointly known as the Central Processing Unit.
    a) Ram, rom
    b) memory, Hard disk
    c) ALU, CU
    d) input, output

40. Text input device - _____
    a) mouse
    b) scanner
    c) Keyboard
    d) joystic

41. _____ is a pointing device
    a) keyboard
    b) mouse
    c) scanner
    d) printer

42. _____ uses light to determine motion
    a) scanner
    b) Optical Mouse
    c) joystick   bar
    d) code reader

43. _____ A control device that consists of a handheld stick
    a) digital pen
    b) stick
    c) joystick
    d) selfi-stick

44. _____ an input device.
    a) website
    b) webpage
    c) webcam
    d) cadcam

45. _____ A low resolutionvideo camera
    a) smartphone camera

b) webcam
c) digital camera
d) video camera

46. _____ An acoustic sensor that provides input by converting sound into electrical Signals
    a) co-processor
    b) microprocessor
    c) Microphone
    d) smartphone

47. output devices are _____
    a) Display, keyboard, Printers, Plotters, Storage media and projectors
    b) Display, monitors, mouse, Plotters, Storage media and projectors
    c) Display, monitors, Printers, Plotters, Storage media and joystick
    d) Display, monitors, Printers, Plotters, Storage media and projectors

48. input devices are _____
    a) Mouse, keyboard, joystick, monitor, microphone and scanner
    b) Mouse, keyboard, joystick, webcam, microphone and scanner
    c) Mouse, keyboard, joystick, webcam, printer and scanner
    d) Mouse, keyboard, joystick, webcam, microphone and projector

49. storage devices are _____
    a) hard disk, cd rom, pen drive, floppy disk, memory card
    b) hard disk, cd rom, pen drive, floppy disk, RAM
    c) hard disk, cd rom, pen drive, digital pen, memory card
    d) hard disk, cd rom, webcam, floppy disk, memory card

50. The most common output device connected to any computer is a _____
    a) Speaker
    b) projector
    c) monitor
    d) printer

51. A network is a combination of _____ and _____ that sends data from one location to another.
    a) hardware, software
    b) server, client
    c) computer, user
    d) adapter, cables

52. The hardware consists of the physical equipment that carries _____ from one point of the network to another.
    a) data
    b) information
    c) signals
    d) program

53. In network we connect various devices except _____
    a) computers
    b) printers
    c) storage
    d) monitors

54. Commonly connected devices include microcomputers, minicomputers, mainframe computers, terminals, printers, fax machines, pagers, and various data storage devices.
    a) TRUE
    b) FALSE

55. _____ is a device which sends the data signal from one terminal to another terminal or workstation in the network system
    a) Receiver
    b) Transmitter
    c) Medium
    d) Protocol

56. _____ is used to receive the data on the network.
    a) Receiver
    b) Transmitter
    c) Medium
    d) Protocol

57. _____ means the Communication Channel through which the data signals are transmitted
    a) Receiver
    b) Transmitter
    c) Medium
    d) Protocol

58. _____ is a measure of the capacity of the medium to transmit the data through it
    a) speed
    b) Bandwidth
    c) rate of receiving
    d) rate of transmitting

59. Bandwidth is measured data transimetted through the medium in terms of mega bits or giga bits per _____
    a) hour
    b) minute
    c) second
    d) day

60. The portion of the electromagnetic spectrum occupied by a signal is called _____
    a) Bandwidth
    b) data
    c) electric signal

d) magnetic waves

61. The bandwidth is difference between the _____ and _____ frequency limits of the signals.

   a) positive, negative
   b) upper, lower
   c) faster, slower
   d) server, client

62. Bandwidth of cable depends on the _____ of cable
   a) thickness
   b) length
   c) material of cable
   d) all of these

63. A _____ length cable provides higher (greater) bandwidth than a lengthy cable
   a) short
   b) thin
   c) both 1 and 2
   d) none of these

64. set of rules for communication across the network is known as _____
   a) contract
   b) protocol
   c) agreement
   d) pact

65. The language used for communication over network of computers is called _____
   a) contract
   b) agreement
   c) pact
   d) protocol

66. Protocol along with _____ and _____ defines the type of network
   a) architecture, topology
   b) architecture, medium
   c) Medium, topology
   d) none of these

67. _____ is the functional structure of interconnection of various computers and devices for effective sharing of resources for optimum performance
   a) topology
   b) protocol
   c) Architecture
   d) medium

68. _____ is the way of establishing the connections for enabling the devices over a network to communicate

a) topology
b) protocol
c) Architecture
d) medium

69. _____ is a plan or design of interconnections leading to desired performance
a) protocol
b) Architecture
c) medium
d) topology

70. A network can be defined as the inter-connection of _____ computers
a) two
b) many
c) two or more
d) none of these

71. Information is divided into _____ for transmission between nodes
a) blocks
b) packets
c) pages
d) messages

72. server is a computer that accesses the resources from the client.
a) TRUE
b) FALSE

73. The _____ may be a complete computer or just a terminal without any local storage device.

a) server
b) client
c) master
d) none of these

74. A specially designed computer that provides shared resources and services to the other computers on the network is known as
a) server
b) client
c) terminal
d) user

75. server is also referred to as master
a) TRUE
b) FALSE

76. _____ are computers connected in such a manner that each of them acts as a server or a client concurrently
a) master

    b) terminal

    c) peers

    d) slave

77. The size of a network can be expressed by the _____ they occupy

    a) server

    b) geographic area

    c) cables

    d) adapters

78. All of these are type of networks except _____

    a) PAN

    b) CAN

    c) MAN

    d) DAN

79. Full form of SAN is

    a) Storage Area Network

    b) Storage And Network

    c) Servers And Network

    d) Small Area Network

80. _____ is a computer network organized around an individual person within a single building

    a) VPN

    b) PAN

    c) LAN

    d) SAN

81. If multiple individuals use the same network within a residence, the network is sometime referred to as _____

    a) VPN

    b) PAN

    c) LAN

    d) HAN

82. _____ consists of a computer network at a single site, typically an individual office building

    a) VPN

    b) PAN

    c) LAN

    d) HAN

83. The smallest LAN may only use _____ computer/s

    a) one

    b) two

    c) three

   d) four
84. _____ speed and relatively _____ cost are the defining characteristics of LANs
    a) low,low   l
    b) ow, high
    c) high, low
    d) high, high
85. If a local area network is entirely wireless, it is referred to as a _____
    a) VPN
    b) WAN
    c) LAN
    d) WLAN
86. _____ is a computer network that covers relatively larger geographical area such as a state, province or country
    a) VPN
    b) WAN
    c) LAN
    d) WLAN
87. WAN is made up of two or more _____ or _____
    a) computers, servers
    b) LANs, MANs
    c) LANs, WANs
    d) LANs, WLANs
88. in WAN Computers are connected through _____ networks
    a) private
    b) public
    c) cables
    d) large
89. _____ are used primarily as information databases
    a) VPN
    b) PAN
    c) LAN
    d) SAN
90. In _____ network most of the shared resources are installed on the main (central) computer

    a) Client / Server
    b) private
    c) Lan
    d) Office

91. _____ is the real-world, useful form of data
    a) program
    b) files
    c) information
    d) software
92. The _____ layer defines the electrical, mechanical, procedural, and functional specifications
    a) network
    b) physical
    c) transport
    d) application
93. Characteristics such as voltage levels, timing of voltage changes, maximum transmission distances, etc are defined by _____
    a) layer   physical
    b) network
    c) transport
    d) application
94. _____ uses a conductor such as a wire or a fiber optic cable to move the signal from sender to receiver
    a) wireless media
    b) unguided media
    c) guided media
    d) none of these
95. _____ uses radio waves of different frequencies and do not need a wire or cable conductor to transmit signals
    a) unguided media
    b) guided media
    c) conducted media
    d) all of these
96. _____ are manufactured so that signals will be confined to a narrow path and will behave predictably.
    a) wireless media
    b) guided media
    c) unguided media
    d) none of these
97. guided media is also known as bounded media
    a) TRUE
    b) FALSE
98. CAT 3, CAT 5, CAT 6 cables are of the type _____
    a) twisted pair wires

b) untwisted pair wires

c) unshielded twisted pair wires

d) shielded twisted pair wires

99. _____ cable is used for television,

a) telephone line and Lan

b) co-axial   cat 5

c) twisted pair

d) none of these

100.   Greater capacity: high-speed point-to-point transmission of app. 10 gbps to 100 gbps can be achieve with the help of _____.

a) co axial cable

b) fibre optic

c) twisted pair

d) unshielded wire

23. Sample Question Paper: Working and Maintenance of Systems (CHMT4-R3)

TOTAL TIME: 2HOURS   **TOTAL MARKS: 100**

(Answer all the questions; each question carries ONE mark)

1. Which of the following is not a type of computer on the basis of operation?
    a. Remote
    b. Hybrid
    c. Analog
    d. Digital
   Ans: Remote

2. A computer that operates on digital data.
    a. Remote
    b. Hybrid
    c. Analog
    d. Digital
   Ans: Digital

3. Any signed negative binary number is recognised by its___
    a. MSB
    b. LSB
    c. Byte
    d. Nibble
   Ans: MSB

4. The parameter through which 16 distinct values can be represented is known as___
    a. Bit
    b. Byte
    c. Word
    d. Nibble
   Ans: Word

5. Which one of the following errors will be handle by the operating system?
    a. Lack of paper in printer
    b. Connection failure in the network
    c. Power failure

d. All of the mentioned

Ans: All of the mentioned

6. If a process fails, most operating system write the error information to a ____
    a. New file
    b. Another running process
    c. Log file
    d. None of the mentions.

    Ans: Log file

7. Which of the following is not a real time operating system?
    a. RTLinux
    b. Palm OS
    c. QNX
    d. VxWorks

    Ans: Palm OS

8. The FCFS algorithm is particularly troublesome for___
    a. Operating systems
    b. Multiprocessor systems
    c. Time sharing systems
    d. Multiprogramming system

    Ans: Time sharing systems

9. The main memory accommodates____
    a. Cpu
    b. User processes
    c. Operating system
    d. All of the mentioned

    Ans: Operating system

10. Computer has a built-in system clock that emits millions of regularly spaced electric pulses per ___ called clock cycles.
    a. Second
    b. Millisecond
    c. Microsecond
    d. Minute

    Ans: second

11. The operation that does not involves clock cycles is __
    a. Installation of a device
    b. Execute
    c. Fetch
    d. Decode

Ans: Installation of a device

12. MAR stands for___
    a. Memory address register
    b. Main address register
    c. Main accessible register
    d. Memory accessible
    Ans: Memory address register

13. Which of the following part of a processor contains the hardware necessary to perform all the operations required by a computer?
    a. Controller
    b. Registers
    c. Cache
    d. Data path
    Ans: Data path

14. Which of the following is a type of microprocessor?
    a. CISC
    b. RISC
    c. EPIC
    d. All of the mentioned
    Ans: All of the mentioned

15. The microprocessor of a computer can operate on any information if it is present in _____ only.
    a. Program Counter
    b. Flag
    c. Main Memory
    d. Secondary Memory
    Ans: Main Memory

16. Which of the following technology was used by Intel to design its first 8-bit microprocessor?
    a. NMOS
    b. HMOS
    c. PMOS
    d. TTL
    Ans: PMOS

17. What is the word length of an 8-bit microprocessor?
    a. 8-bits – 64 bits
    b. 4-bits – 32 bits
    c. 8-bits – 16 bits

d. 8-bits – 32 bits

Ans: 8-bit – 64 bits

18. Which of the following is a special-purpose register of microprocessor?
   a. Program counter
   b. Instruction register
   c. Accumulator
   d. Temporary register

   Ans: Program counter

19. The main purpose of laptop design is
   a. For Entertainment
   b. For Portability
   c. To increase data transfer speed
   d. To reduce Cost

   Ans: For Portability

20. The CPU of a laptop produces
   a. Less Heat
   b. Light Heat
   c. Very High Heat
   d. Do Not Produce Heat

   Ans: Less Heat

21. Memory Modules used by Laptop is called
   a. PCI
   b. ZIF Socket
   c. SIMM
   d. SO-DIMM

   Ans: SO-DIMM

22. In laptop, all internal component is connected to the system board which is known as
   a. Mother Board
   b. Switch Board
   c. Component Board
   d. Common Board

   Ans: Mother Board

23. Express Card is also known as
   a. Standard Card
   b. PCMCIA Card
   c. Standalone Card
   d. Special Card

   Ans: PCMCIA Card

24. The capacity of a laptop battery is expressed in terms of
    a. Current rating
    b. Voltage rating
    c. Ampere hour rating
    d. None of the above
    Ans: Ampere hour rating

25. What kind of technology is used in the LCD/LED display of the laptop?
    a. Zoop raxioscope
    b. Active Matrix Display
    c. Photonic switching
    d. Graphics accelarator
    Ans: Active Matrix Display

26. Which kind of battery is used by current laptops
    a. Lithium-Ions
    b. Lead acid
    c. Nickel metal hydride
    d. Nii-cd
    Ans: Lithium-Ions

27. Which device is first removed during hardware troubleshooting of a laptop
    a. LCD
    b. Keyboard
    c. Battery
    d. HDD
    Ans: Battery

28. BIOS is abbreviated as _____
    a. Basic Input Output Server
    b. Basic Internet Output Systems
    c. Basic Input Output System
    d. Battery-based Input Output System
    Ans: Basic Input Output System

29. _____ passwords are next level of security.
    a. BIOS
    b. CMOS
    c. SMOS
    d. BOIS
    Ans: BIOS

30. Which is loaded into memory when system is booted?

a. Kernel
b. Shell
c. Commands
d. Script
Ans: Kernel

31. Bootstrapping is also known as
    a. Quick boot
    b. Cold boot
    c. Hot boot
    d. Fast boot
   Ans: Cold boot

32. Which of the following does not occur during the power-on-self-test (POST)?
    a. The ScanDisk utility begins to run
    b. The video card and video memory are tested
    c. The BIOS identification process occurs
    d. Memory chips are checked
   Ans: The ScanDisk utility begins to run

33. SATA initially came as a evolution/improvement ove
    a. IDE
    b. Fiber Channel
    c. SAS
    d. SCSI
   Ans: IDE

34. What is the BUS architecture used by SATA?
    a. Parallel
    b. Serial
    c. Depends on the chipset used
    d. None of the mentioned
   Ans: Serial

35. Maximum number of SATA devices that can be connected through SATA is
    a. 1
    b. 5
    c. 8
    d. 15
   Ans: 15

36. What is the maximum distance that you can connect through a SATA?
    a. 1 meter
    b. 1 kilometers

    c. 100 kilometers' with repeaters

    d. 5 meters

Ans: 1 meter

37. What is an operating system?

    a. interface between the hardware and application programs

    b. collection of programs that manages hardware resources

    c. system service provider to the application programs

    d. all of the mentioned

Ans: all of the mentioned

38. What is the main function of the command interpreter?

    a. to provide the interface between the API and application program

    b. to handle the files in the operating system

    c. to get and execute the next user-specified command

    d. none of the mentioned

Ans: none of the mentioned

39. In Operating Systems, which of the following is/are CPU scheduling algorithms?

    a. Priority

    b. Round Robin

    c. Shortest Job First

    d. All of the mentioned

Ans: All of the mentioned

40. To access the services of the operating system, the interface is provided by the
_____

    a. Library

    b. System calls

    c. Assembly instructions

    d. API

Ans: System calls

41. CPU scheduling is the basis of _____

    a. multiprogramming operating systems

    b. larger memory sized systems

    c. multiprocessor systems

    d. none of the mentioned

Ans: multiprogramming operating systems

42. In a timeshare operating system, when the time slot assigned to a process is completed, the process switches from the current state to?

    a. Suspended state

    b. Terminated state

     c. Ready state

     d. Blocked state

Ans: Ready state

43. The operating system is responsible for?
     a. bad-block recovery
     b. booting from disk
     c. disk initialization
     d. all of the mentioned

Ans: all of the mentioned

44. The operating system maintains a _____ table that keeps track of how many frames have been allocated, how many are there, and how many are available.
     a. memory
     b. mapping
     c. page
     d. frame

Ans: frame

45. In real time operating system _____
     a. process scheduling can be done only once
     b. all processes have the same priority
     c. kernel is not required
     d. a task must be serviced by its deadline period

Ans: a task must be serviced by its deadline period

46. Which of the following is not a type of virus?
     a. Boot sector
     b. Polymorphic
     c. Multipartite
     d. Trojans

Ans: Trojans

47. A computer _____ is a malicious code which self-replicates by copying itself to other programs.
     a. program
     b. virus
     c. application
     d. worm

Ans: virus

48. Which of them is not an ideal way of spreading the virus?
     a. Infected website
     b. Emails

c. Official Antivirus CDs

d. USBs

Ans: Official Antivirus CDs

49. _____ gets installed & stays hidden in your computer's memory. It stays involved to the specific type of files which it infects.
    a. Boot Sector Virus
    b. Direct Action Virus
    c. Polymorphic Virus
    d. Multipartite Virus

Ans: Direct Action Virus

50. _____ infects the executables as well as the boot sectors.
    a. Non-resident virus
    b. Boot Sector Virus
    c. Polymorphic Virus
    d. Multipartite Virus

Ans: Multipartite Virus

51. A _____ is a small malicious program that runs hidden on infected system.
    a. Virus
    b. Trojan
    c. Shareware
    d. Adware

Ans: Trojan

52. Which of them is not a proper way of getting into the system?
    a. IM
    b. Attachments
    c. Official product sites
    d. Un-trusted sites, freeware and pirated software

Ans: Official product sites

53. Which of the following port is not used by Trojans?
    a. UDP
    b. TCP
    c. SMTP
    d. MP

Ans: MP

54. Once activated _____ can enable _____to spy on the victim, steal their sensitive information & gain backdoor access to the system.
    a. virus, cyber-criminals
    b. malware, penetration testers

    c.   trojans, cyber-criminals

    d.   virus, penetration testers

Ans: trojans, cyber-criminals

55. Which out of the following Binary numbers is equivalent to decimal number 24
    a. 1101111
    b. 11000
    c. 111111
    d. 11001

Ans: 11000

56. The Base of the hexadecimal number systems is
    a. 6
    b. 8
    c. 16
    d. 10

Ans: 16

57. If each Successive Code differs from its preceding code by a single bit only,Then this code is called
    a. BCD code
    b. Gray Code
    c. Weighted Code
    d. Binary Code

Ans: Gray Code

58. The ASCII code is basically
    a. 5 Bit code
    b. 6 bit code
    c. 7 bit code
    d. 4 bit code

Ans: 7 bit code

59. The universal gate is
    a. NAND gate
    b. OR gate
    c. AND gate
    d. NOT gate

Ans: NAND gate

60. How many types of number systems are there?
    a. One
    b. Two
    c. Three

d. Four

Ans: Four

61. The base is eight for _____ number system
   a. Binary
   b. Hexadecimal
   c. Decimal
   d. Octal

   Ans: Octal

62. The most suitable gate for comparing two bits is
   a. AND
   b. OR
   c. NAND
   d. X-OR

   Ans: X-OR

63. Which of the following gates cannot be used as an inverter?
   a. NAND
   b. AND
   c. NOR
   d. X-NOR

   Ans: NOR

64. A gate is disabled when its disable input is at logic 0. The gate is
   a. AND
   b. NOR
   c. OR
   d. None of these

   Ans: AND

65. A multiplexer is also called ___?
   a. MUX
   b. Data selector
   c. Multiplexor
   d. All of these

   Ans: Multiplexor

66. A method of transmitting many signals over a specific medium is known as ____?
   a. Multiplexing
   b. De-multiplexing
   c. Aliasing
   d. Amplifying

   Ans: Multiplexing

67. The truth table for an S-R flip-flop has how many VALID entries?
    a. 1
    b. 2
    c. 3
    d. 4
    Ans: 3

68. When both inputs of a J-K flip-flop cycle, the output will
    a. Be invalid
    b. Change
    c. Not change
    d. Toggle
    Ans: Not change

69. A basic S-R flip-flop can be constructed by cross-coupling of which basic logic gates?
    a. AND or OR gates
    b. XOR or XNOR gates
    c. AND or NOR gates
    d. NOR or NAND gates
    Ans: NOR or NAND gates

70. The sequential circuit is also called _____
    a. Flip-flop
    b. Latch
    c. Strobe
    d. Adder
    Ans: Latch

71. In S-R flip-flop, if Q = 0 the output is said to be _____
    a. Set
    b. Reset
    c. Previous state
    d. Current state
    Ans: Reset

72. In a timeshare operating system, when the time slot assigned to a process is completed, the process switches from the current state to?
    a. Suspended state
    b. Terminated state
    c. Ready state
    d. Blocked state
    Ans: Ready state

73. A deadlock avoidance algorithm dynamically examines the _____ to ensure that a circular wait condition can never exist.

a. operating system
b. resources
c. system storage state
d. resource allocation state

Ans: resource allocation state

74. _____ is the program which is used to start the computer once the computer is turned on.
   a. processor
   b. CMOS
   c. RAM
   d. BIOS

   Ans: RAM

75. _____is used/placed to cool the processor in the motherboard, whenever it gets hot
   a. Water
   b. Ice box
   c. Fan
   d. Air Conditioner

   Ans: Fan

76. Which of the following processor has a fixed length of instructions?
   a. CISC
   b. RISC
   c. EPIC
   d. Multi-core

   Ans: RISC

77. A circuitry that processes that responds to and processes the basic instructions that are required to drive a computer system is _____
   a. Memory
   b. ALU
   c. CU
   d. Processor

   Ans: Processor

78. CISC stands for _____
   a. Complex Information Sensed CPU
   b. Complex Instruction Set Computer
   c. Complex Intelligence Sensed CPU
   d. Complex Instruction Set CPU

   Ans: Complex Instruction Set Computer

79. LCD stands for:
   a. Liquid Crystalline Display

b. Liquid Crystal Display
c. Logical Crystal Display
d. Liquid Crystal Device

Ans: Liquid Crystal Display

80. What is the most popular category of portable PCs?
    a. Notebook
    b. Palmtop
    c. Laptop
    d. Suitcase computer

Ans: Laptop

81. Which of the following system modules makes a PC really portable?
    a. Battery
    b. AC adapter
    c. DC controller
    d. PC Card

Ans: Battery

82. A plastic card with inbuilt memory and a microprocessor that resembles a credit card is:
    a. Chip card
    b. Card punch
    c. Magnetic tape
    d. Punched paper tape

Ans: Punched paper tape

83. A USB communication device is referred to as a _____ if it offers data encryption for a safe wireless connection for laptop users.
    a. USB wireless network adapter
    b. wireless switch
    c. wireless hub
    d. router

Ans: USB wireless network adapter

84. Which of the following port is used to connect a laptop with a wired network?
    a. Super video port
    b. Parallel port
    c. Ethernet port
    d. USB port

Ans: Ethernet port

85. Which port can support both audio and video?
    a. USB port
    b. IDE port

      c. VGA port

      d. HDMI Port

Ans: HDMI Port

86. Which Laptop storage is best?
      a. HDD
      b. SSD
      c. Floppy disk
      d. RAM

Ans: SSD

87. what are the parts of a laptop charger?
      a. Transformer and Power cord
      b. Brick and wire
      c. Adapter and cable
      d. USB

Ans: Transformer and Power cord

88. From where can the boot option be selected?
      a. Advanced BIOS Features
      b. Advanced Chipset Features
      c. CPU Soft menu
      d. Power management Setup

Ans: Advanced BIOS Features

89. Which chip contains the system BIOS and can hold data permanently, even without electricity?
      a. Flash ROM
      b. NVRAM
      c. RAM
      d. ROM

Ans: Flash ROM

90. What is POST?
      a. post-operative self-test
      b. PC operating system test
      c. power-on self-test
      d. personal overall starter test

Ans: power-on self-test

91. Where is POST located?
      a. System ROM
      b. CMOS
      c. POST expansion card

d. RAM

Ans: System ROM

92. What else is a command interpreter called?
    a. prompt
    b. kernel
    c. shell
    d. command
Ans: shell

93. What is the full name of FAT?
    a. File attribute table
    b. File allocation table
    c. Font attribute table
    d. Format allocation table
   Ans: File allocation table

94. Which among the following interacts directly with system hardware?
    a. Shell
    b. Commands
    c. Kernel
    d. Applications
   Ans: Kernel

95. Which is the Linux operating system?
    a. Private operating system
    b. Windows operating system
    c. Open-source operating system
    d. None of these
   Ans: Open-source operating system

96. A system software that helps Operating System to communicate with a device is called
    a. Operating system
    b. Device Driver
    c. Utility
    d. Graphics Software
   Ans: Device Driver

97. Computer virus is simply meaning is _____
    a. hardware component
    b. disease
    c. set of computer instructions or code
    d. All of these
   Ans: set of computer instructions or code

98. Which of the following is not the symptoms of an infected Computer?
    a. Run Slower Than Normal
    b. Sudden Freezes & Crashes
    c. Faster Internet Processing
    d. Show a blue screen with error code
   Ans: Faster Internet Processing

99. eScan Anti-Virus Toolkit is supported by which of the following operating sytem?
    a. MaC
    b. Windows
    c. Linux
    d. Android
   Ans: Windows

100.   Quick Heal, Norton, AVG, Smart Dog, Mc Affee etc are the examples of
    a. Antivirus
    b. Boot sector virus
    c. Worms
    d. Trojan Horses
   Ans: Antivirus

24. Sample Question Paper: Employability Skills (CHMT-ES-R3)

Will be available soon