







### Semester V

| Paper Code | Title   | Generic / Skill Component | Theory / Practical | Internal (Theory) | External (Theory) | Internal (Practical) | External (Practical) | Credit |
|------------|---|---------------------------|--------------------|-------------------|-------------------|----------------------|----------------------|--------|
| GE         | Critical thinking<br>Essential tests          | General                   | Theory             |                   |                   |                      |                      |        |
| GC         | Introduction to<br>Statistics<br>An important | General                   | Theory             |                   |                   |                      |                      |        |
| H          | Lecture                                       |                           | Theory             |                   |                   |                      |                      |        |
| H          | Lecture                                       |                           | Theory             |                   |                   |                      |                      |        |

**B.Voc. (HARDWARE AND NETWORKING) Semester: I**

**Paper Title: COMMUNICATION SKILLS Paper Code: \*GEN 101 Credits: 6**

**Job Role: Field Technician-Computing and Peripherals**

**Objective:** To evaluate the student's ability to understand and apply the concepts of communication in the field of computing and peripherals.

**Instructions for Examiner:**

- 1. The student is to answer any five questions out of the following.
- 2. Each question carries 20 marks.
- 3. The student is to answer the questions in their own words.
- 4. The student is to write the answers in their own words.
- 5. The student is to write the answers in their own words.

**UNIT-I**

**Introduction to Communication:** This unit covers the basic concepts of communication, including the sender, receiver, message, and channel. It also discusses the importance of communication in the field of computing and peripherals.

## **UNIT-III**







**Paper Title: COMPUTER HARDWARE**

**Paper Code: HWN-103**

**Credits: 6**

**Job Role: Field Technician-Computing and Peripherals**

**Objectives:** Her e Fun e nt e s n e t stu nts to e rn e out e r e t no o s t r

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F. e. t. u. r. s. o. r. e.

### Practical based on HWN-103

#### Instructions for practical:

E. e. n. r. s. t. o. t. e. o. u. r. q. u. e. s. t. i. o. n. s. o. v. e. r. n. e. w. o. s. e. u. s.  
t. u. n. t. e. t. t. p. t. e. n. t. r. q. u. e. s. t. i. o. n.

E. e. q. u. e. s. t. i. o. n. e. r. s. e. r. s.

r. e. t. e. e. r. s. e. r. s. e. n. e. r. s. o. r. p. r. e. t. e. o. r. e. n. v. e. v.

r. e. t. e. p. e. p. r. o. n. u. t. t. o. n. o. e. o. r. e. t. o. n. t. t. r. s. p. t. v. p. r. t. s.  
e. n. e. r. s. s. u. t. t. o. e. n. e. v. n. v. r. s. t.

#### Suggested Resources for Reading:

Go. v. n. e. r. e. e. u. B. B. C. e. n. C. o. n. s. H. e. r. e. r. r. o. u. s. o. o. t. n. e. n. e. n. t. n. e. n. e. t. e.  
Gr. e. H. n. D.

B. e. s. e. n. r. e. C. o. p. u. t. e. r. s. o. e. G. e. t. e. u. e. t. o. n. s.

C. r. e. Z. e. r. e. C. o. p. t. r. n. C. H. e. r. e. r. e. H. u. e. t. o. n.

#### References Resources:

o. t. t. u. r. e. p. r. e. n. e. n. p. e. r. n. C. e. r. s. o. n.  
e. n. A. n. r. A. G. u. t. o. H. e. r. e. r. e. t. E. t. o. n.

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## **UNIT-IV**

**Paper Title: PRACTICAL ON NETWORKING-IPaper Code: HWN-105 Credits: 6**

**Job Role: Field Technician-Computing and Peripherals**

**Objectives:** To evaluate the student's practical skills in identifying and troubleshooting network hardware and software issues.

**Instructions for Examiner:**

Examiner should read the questions over to the student before starting the practical. The student should be allowed to ask for clarification if needed. The student should be given a maximum of 15 minutes to complete the practical. The student should be allowed to use any tools or equipment available in the lab. The student should be allowed to use any resources available in the lab. The student should be allowed to use any notes or diagrams provided. The student should be allowed to use any other resources available in the lab.

### UNIT-I

Identify the components of a network. Explain the function of a network interface card (NIC). Explain the function of a network switch. Explain the function of a network router. Explain the function of a network firewall. Explain the function of a network proxy server. Explain the function of a network load balancer. Explain the function of a network intrusion detection system (IDS). Explain the function of a network intrusion prevention system (IPS). Explain the function of a network intrusion detection and prevention system (IDPS). Explain the function of a network intrusion detection and prevention system (IDPS).

### UNIT-II

Identify the components of a network. Explain the function of a network interface card (NIC). Explain the function of a network switch. Explain the function of a network router. Explain the function of a network firewall. Explain the function of a network proxy server. Explain the function of a network load balancer. Explain the function of a network intrusion detection system (IDS). Explain the function of a network intrusion prevention system (IPS). Explain the function of a network intrusion detection and prevention system (IDPS). Explain the function of a network intrusion detection and prevention system (IDPS).

### UNIT-III

Identify the components of a network. Explain the function of a network interface card (NIC). Explain the function of a network switch. Explain the function of a network router. Explain the function of a network firewall. Explain the function of a network proxy server. Explain the function of a network load balancer. Explain the function of a network intrusion detection system (IDS). Explain the function of a network intrusion prevention system (IPS). Explain the function of a network intrusion detection and prevention system (IDPS). Explain the function of a network intrusion detection and prevention system (IDPS).

## UNIT-IV

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t n o a p at pat or s onn tors tr n s

### Suggested Resources for Reading:

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C s o t or n Ess nt s Aut or an tro l ut or on. ons  
s Gupt Co H r an t or n Cours t st E ton Dr t r ss  
Cr pto n t or urt r E ton r H E u t on

### References Resources:

C s o B mn rs Gu F t E ton Gr H s orn a  
t or n Co p t r n st E ton r H E u t on

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### UNIT III

Introduction to Business  
of Management  
Human Resource Management  
Development of Management





An r Cr n D r t n Bus n ss Et s or v n v rs t r ss D  
 D n A qu rqu Bus n ss Et s r n p s n r t s n n E t on or  
 v n v rs t r ss D  
 Fr For n o C o Bus n ss Et s n o spons t stor

**References Resources:**

C F rr o n Fr r L n F rr Bus n ss Et s Et n D s on n  
 C s s C n n L n n  
 B o A n urr Corpor t spons t A Cr t n tro u t on  
 or v n v rs t r ss D

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**Paper Title: PERSONAL COMPUTING SOFTWARE Paper Code: HWN-203 Credits:6**

**Job Role: Field Technician-Computing and Peripherals**

**Objectives:** o t v o t s ours s to n r v stu nts t Fun n t s o n or t on  
 n o o n ts pp t ons t n s t stu nt to t pr t n posur to r s too s

**Instructions for Examiner:**

s s us o t s p r s n v nto F v un ts  
 E n r s t t o Equ st ons o pr s n o qu st ons ro n un t n u n  
 u st on o o pu sor o s ort ns r t p o v r n t o s n us  
 stu nts r r qu r to t pt on qu st on ro n un t n t ntr Co pu sor  
 u st on o  
 A qu st ons r r qu n r s

**UNIT- I**

D rs ons o D Boot n s qu n n Co r oot Con pt o F n r tor  
 r t n o n nput n output p p s n r n t rs

D↑ / E↑ Y E E      L E t mē Co ēn s XC Y A↑↑ B BAC v J E↑ E F D  
 Y F / A↑ CH D D C Y LABEL      E↑ EE DE↑ EE DEF AG CA D  
 J DELE↑ E Bāt F s ntro uton to s p ēt s ntro uton to C FG Y ēn  
 A↑ EXEC BA↑ s Grēp ē v s r ntr ē Fun ē ntē s o n o s t p s o n o s  
 ēnēto o n o s o n s      n p rē t o n s o n n o p n n ē. n o v n v n ēn  
 v ē v n ē n o v o v n n o s v n . n o C o s n t n o n o s p o r r  
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## UNIT- II

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## Practical based on HWN-203

### Instructions for practical:

Enr s tot o our qu st ons o r n t o s us  
tu nt tt pt n tr qu st on  
Enr qu st on r s r s  
r t r s r s n r s or pr t or n  
r t p r on ut t o n o r t on t t r sp t p rts n  
r s su tt to n n r s t

### Suggested Resources for Reading:

at ur r n n or or n o s t p t p G ot  
at ur r n n E or n o s t p t p G ot  
s r s A s u n o s G ot B s n r

### References Resources:

Co put rs o G ot  
ss r B r r s n t nt m t H t D  
D v A t rs s n t or H n D



### UNIT- III

ro ssor B<sub>2</sub>s s p r or <sub>2</sub>n <sub>2</sub> tors o s nstru t on s t C C C <sub>2</sub>n up rs <sub>2</sub> <sub>2</sub>r ro ssor  
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## UNIT- IV





## **UNIT- IV**



## UNIT-IV

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#### UNIT- IV

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En r pt n an r pt n o rs an s

#### Practical based on HWN-303

##### Instructions for practical:

E an r s t tot o our qu st ons o v r n t o s a us

tu nt at pt an tr qu st on

E qu st on ar s ar s

ra t a ar s ar s an ar s or pr t a or an \ \ \

ra t a p ar on u t j t o n o a or at on t t r sp t v p rts an  
ar s su tt to an a \ n v rs t

##### Suggested Resources for Reading:

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B a s an ra Co put rs o a G a ot a

at ur a \ L an n . or or. n o s t p . t p G a ot a

at ur a \ L an n E or. n o s t p . t p G a ot a

##### References Resources:

D ar G son / roso t. n o s t or n Ess nt a s st E t on

**Paper Title: ROUTING & SWITCHING**

**Paper Code: HWN-304**

**Credits: 6**

**Job Role: Network Support Engineer**

**Objective:** This course provides an in-depth understanding of network operations and configuration. It aims to equip students with the necessary skills to design, implement, and troubleshoot network systems.

## UNIT- IV





## UNIT-IV

Convergent routing LA routing out r on st su nt r s upstr routing  
n psu t on Con ur nt r s n C s o F s Boot r r n s C s o s

**B.Voc. (HARDWARE AND NETWORKING)**

**Semester : IV**

**Paper Title: ENVIRONMENTAL STUDIES Paper Code: \* GEN 401 Credits: 6**

**Job Role: Network Support Engineer**

to provide support to users on the network environment to ensure that the network is available and secure. This role involves monitoring network performance, troubleshooting issues, and implementing security measures.

**Instructions for Examiner:**

- The questions are to be attempted in the order given.
- Each question carries 10 marks.
- The total marks for the paper are 100.
- The duration of the examination is 3 hours.
- The questions are to be attempted in the order given.
- Each question carries 10 marks.
- The total marks for the paper are 100.
- The duration of the examination is 3 hours.
- The questions are to be attempted in the order given.
- Each question carries 10 marks.
- The total marks for the paper are 100.
- The duration of the examination is 3 hours.

**UNIT-I**

**Basics of environment:** Introduction to the environment, the atmosphere, the hydrosphere, the lithosphere, and the biosphere. The environment is the sum of all the physical and biological factors that surround and influence the life of organisms.

**UNIT-II**

Non-renewable resources: Coal, oil, natural gas, and minerals. Renewable resources: Water, wind, solar, and biomass. Conservation of resources: The need to conserve resources and the role of individuals and organizations in resource conservation.

**UNIT-III**

**Pollution:** Air pollution: Sources of air pollution, particulate matter, and air quality index. Water pollution: Sources of water pollution, water quality index, and water treatment. Soil pollution: Sources of soil pollution, soil quality index, and soil remediation.

## **UNIT-IV**

**Global environment issues:**

**Paper Title: PROJECT MANAGEMENT    Paper Code: GC-402    Credits: 6**

**Job Role: Network Support Engineer**

**Objectives:**

**Suggested Resources for Reading:**

rotation, Couette flow, Gravitational

rotation, cylindrical coordinates, stress, pressure, Newton's law of viscosity

requirements, [1](#), [2](#), [3](#), [4](#), [5](#), [6](#), [7](#), [8](#), [9](#)

**Paper Title: WINDOWS SERVER ADMINISTRATION**  
**Credits: 6**

**Paper Code: HWN-403**

**Job Role: Network Support Engineer**

**Objective:** The objective of this paper is to provide practical knowledge to the students about the various services and protocols used in Windows Server Administration. The students should be able to identify the various services and protocols used in Windows Server Administration and explain their functions. The students should also be able to configure and manage these services and protocols.

### UNIT-III

**Microsoft Windows Server** D p o n e n e n e n o s r v r n t r o u t o n t o A t v  
D r t o r D o e n r v s n s t e n D o e n C o n t r o l s e n A t v D r t o r D o e n r v s  
t s A u t o e t n A t v D r t o r D o e n r v s A n s t r e t o n p n t n D n e H o s t  
C o n u r e t o n r o t o o p n t n D p n t n L o e t o r e p n t n F e n r n t  
r v s

### UNIT-IV

**Windows Security** F r e s p e r v r u s s v s r e o u n t s s u r t e r s t r e t s s t  
p r o r e n e r o u s o o t n t o o s . n o s r s t r A n s t r n . n o s r v r C o n u r n e n  
e r o u s o o t n D o e n e s t C o n u r n e n e r o u s o o t n D



**Paper Title: NETWORK ADMINISTRATION & TROUBLESHOOTING**

**Paper Code: HWN-404 Credits: 6**

**Job Role: Network Support Engineer**

**Objective:** The objective of this course is to train students to gain practical experience in network administration and support.

**Instructions for examiner:**

- 1. This is a set of papers to be used for the final units.
- 2. Each paper contains a total of 10 questions. Only 5 questions are to be attempted from each unit.
- 3. The questions are to be attempted from the Computer Science unit.
- 4. All questions are to be attempted.

**UNIT-I**

1. Define the term network. Discuss the various types of networks. Explain the difference between LAN and WAN. Discuss the various types of network topologies. Explain the difference between bus and ring topologies. Discuss the various types of network protocols. Explain the difference between TCP/IP and OSI models. Discuss the various types of network devices. Explain the difference between hub and switch. Discuss the various types of network services. Explain the difference between DHCP and DNS. Discuss the various types of network attacks. Explain the difference between virus and worm. Discuss the various types of network security. Explain the difference between firewall and intrusion detection system.

## **UNIT-IV**

**Paper Title: SWITCHING CONFIGURATION & NETWORK CONNECTIVITY**

**Paper Code: HWN-405**

**Credits: 6**

**Job Role: Network Support Engineer**

**Objective:** to identify the various network protocols and services used in a network environment and to identify the various network devices and their functions. The candidate should be able to identify the various network devices and their functions and to identify the various network protocols and services used in a network environment.

**Instructions for examiner:**

Examiner should total of our questions over the course of the examination. The candidate should attempt to answer all the questions.

Each question carries 4 marks.

The candidate should answer the questions in the order given in the question paper.

The candidate should use the answer sheet provided for the purpose of the examination.

### UNIT-III

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s t op r t on us n s ut t s su s p n t n t H D s r o L A s r t o s  
s p r t n t or s n t n or rout n t n t E p n n t or s n t on n s tr  
n t on pts Con ur an v r L A s

### UNIT-IV



**B.Voc. (HARDWARE AND NETWORKING)**

**Semester : V**

**Suggested Resources for Reading:**

Cou Y. Lun. *Unit 1: The Art of Learning*. ns on

Lin. *Unit 2: The Art of Learning*. ns on

**References Resources:**

A. *Unit 3: The Art of Learning*. ns on

**Paper Title: INTRODUCTION TO RESEARCH METHODOLOGY AND REPORT WRITING**

**Paper Code: GC 502**

**Credits: 6**

**Job Role: Network Administrator**

**Objective:** To evaluate the understanding of the students in the research methodology and report writing.

**Instructions for examiner:**

The student is to answer any five questions out of the following.

Each question carries 10 marks. Each question is to be answered in 100 words.

The student is required to attempt any five questions out of the following.

Answer any five questions.

**UNIT I**

Research is a systematic and logical investigation to discover new knowledge. It is a process of gathering, analyzing, and interpreting data to answer a question or solve a problem.

**UNIT II**

Research design is a plan or blueprint that guides the researcher in the collection, analysis, and interpretation of data.

**UNIT III**

Data is information that has been processed into a form that is meaningful and useful for decision-making.

**UNIT IV**

Business reports are documents that provide information and analysis to help management make decisions.







Co un t on t u t n o r n s r t s t e p n n r t on n  
onn t n to r ot e n

#### UNIT -IV

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o s o o s st e n str t or e n n us r e ounts e n t n us rs e n n  
p r s s ons e n o n rs ps nst e t on o L nu s st L nu nst e t on r qu r nt o p t  
ro ur st ps e r t t on n t H e r r s t st e rtup e n s ut o n pro ss n t e n run s  
F s st ount n pst e t e up str t nst e n so t e r on L nu

#### Practical based on HWN-503

#### Instructions for practical:

E e n r s t tot e o our qu st ons o r n t o s e us  
tu nt e tt pt e n t r qu st on

E e qu st on e r s e r s

r e t e e r s e r s e n e r s or pr e t e or e n s s

r e t e p e p r on u t t o n o e or e t on t t r sp t p rts e n  
e r s su tt to e n e n r s t

#### Suggested Resources for Reading:

e r r L nu n e s e u s n Hous  
orton Co p t u to L X  
o e r ns L X st A n str t on H e n oo A  
o n Go n L nu ro r e n B DG Boo s D

#### References Resources:

n e t s urt G ntro u t on to X ro r e n e rson E u t on  
e r D e son Gr or ur L nu t or A n str t on Gu r



### UNIT-III

Conjunctions, Disjunctions, Implication, Contradiction, Logical Equivalence, Truth Tables, De Morgan's Laws, Predicate Logic, Quantifiers, Set Theory, Venn Diagrams, Probability, Combinatorics, Permutations, Combinations, Binomial Theorem, Pascal's Triangle, Mathematical Induction, Recursion, Graph Theory, Trees, Networks, Shortest Path Algorithms, Graph Coloring, Hamiltonian Paths, Eulerian Paths, Combinatorial Game Theory, Game Theory, Probability Distributions, Random Variables, Expectation, Variance, Covariance, Correlation, Regression Analysis, Probability Density Functions, Cumulative Distribution Functions, Normal Distribution, Central Limit Theorem, Poisson Distribution, Binomial Distribution, Geometric Distribution, Exponential Distribution, Markov Chains, Queueing Theory, Stochastic Processes, Markov Decision Processes, Dynamic Programming, Game Theory, Auction Theory, Mechanism Design, Voting Systems, Social Choice Theory, Mechanism Design, Auction Theory, Voting Systems, Social Choice Theory.

### UNIT-IV

Algorithms, Complexity Analysis, Sorting Algorithms, Searching Algorithms, Graph Algorithms, Dynamic Programming, Combinatorial Optimization, Game Theory, Auction Theory, Voting Systems, Social Choice Theory, Mechanism Design, Auction Theory, Voting Systems, Social Choice Theory.

**Paper Title: ADVANCED ROUTING AND SWITCHING Paper Code: HWN-505 Credits:6**

**Job Role: Network Administrator**

**Objective:** Outcomes that the candidate should be able to demonstrate on completion of the course are as follows:

**Instruction for examiner:**

Each candidate should attempt all the questions.

Each question carries 10 marks.

The total marks for the paper are 100.

The paper is to be attempted in the English language.

### UNIT- I

Ability to design and implement a network topology that meets the requirements of a given scenario.

### UNIT- II

Ability to design and implement a network topology that meets the requirements of a given scenario.

### UNIT- III

Ability to design and implement a network topology that meets the requirements of a given scenario.

### UNIT- IV

Ability to design and implement a network topology that meets the requirements of a given scenario.

**Suggested Resources for Reading:**

Cost CC out n n t n H H C rt Gu rson n n  
o L n n out n n t n tu Gu n n Lt  
CC A C s o C rt t or Asso t tu Gu r E t on r H E u t on

**References Resources:**

n C s o t or n Ess nt s Aut or o L

**B.Voc. (HARDWARE AND NETWORKING)**

**Semester : VI**

**Paper Title: - ENTREPRENEURSHIP DEVELOPMENT PROGRAMME**

**Paper Code: \*GEN 601Credits: 6**

**Job Role: Network Administrator**

**Objective:** ED s a t tr a n n v r o u s t r t r o u p s n n t r p r n u r a t r a t s o t a t t o t a n a q u a t n o r a t o n o t v t o n a n u a n n s t t n u p t r o n n t r p r s s

**Instructions for examiner:**

- ↑ s a u s o t s p a p r a s n v n t o F v J u n t s
- E a n r s t a t o t a o E q u s t o n s o p r s n ↑ o q u s t o n s r o a u n t n u n u s t o n o o p u s o r o s o r t a n s r t p o v r n t o s a u s
- ↑ s t u n t s a r r q u r t o a t t p t o n q u s t o n r o a u n t a n t n t r C o p u s o r u s t o n o
- A q u s t o n s a r r q u a a r s

**UNIT-I**

**Entrepreneur:** D n t o n n a t u r a n a r a t r s t s o n t r p r n u r s p E r n o n t r p r n u r a s s n u n o n n t r p r n u r s ↑ o r s o n t r p r n u r s p o o o n o n v r o n n t a n t n t r p r n u r C a r a t r s t s o E n t r p r n u r l a r s p s t a n D s o n a n a n u s n s s p a n n n n n o v t o n a n E n t r p r n u r s p n t r p r n u r a a v o u r a n o t v t o n

**UNIT-II**

**Small Business as a Seed Bed of Entrepreneurship:** C o n p t o u s n s s v n t u r ↑ s t a r t u p p r o s s C o n p t a n p n t a t o n n t a t r a t a n n n r o u t a n a r t n o p l a a n ↑ a o n s r a t o n s a n a s s a n n a n a o n s r a t o n s r o t a n n n n a E n t r p r s G r o t t r a t s a n v r s a t o n

**UNIT-III**

F n a n a n e n t n u r r n t o p r a t o n s a n p a n s o n o a p t a o o a B u s n s s n t n a t o n a o n o a t o n a o s o r s a u s n s s v o p n t G o v r n n t a a n o n G o v r n n t a a s s t a n C o n t r u t o n o C o r a B a n s n p r o o t n a n s r v n s a u s n s s a u s n s s a n o r n t n o o





**Paper Title: TOTAL QUALITY MANAGEMENT**

**Paper Code: GC 602**

**Credits:6**

**Job Role: Network Administrator**

**Objective:** The objective of this paper is to provide information to students on the importance of total quality management in the current business environment and its impact on the organization's performance.

**Suggested Resources for Reading:**

↑ otē pē t / ēnē nt A F n ēu / Grē H u ēt on  
↑ otē pē t / ēnē nt ē ēn Butt r ort H n ēnn Lt or r ss  
pē t / ēnē nt Con pts ēn ↑ ēs s ērē ēnē r n ēsēn A  
nt rnēt onē

**Paper Title: WIRELESS COMMUNICATION AND NETWORKING**

**Paper Code: HWN- 603 Credits: 6**

**Job Role: Network Administrator**

**Objective:** The course enables the student to study about the various aspects of wireless communication and network technologies.

**Instructions for examiner:**

- The student is to answer any five questions out of the following questions.
- Each question carries 20 marks. The total marks for the paper are 100.
- The student is to answer any five questions out of the following questions.
- The student is to answer any five questions out of the following questions.
- The student is to answer any five questions out of the following questions.

**UNIT I**

The student is to answer any five questions out of the following questions. The student is to answer any five questions out of the following questions. The student is to answer any five questions out of the following questions. The student is to answer any five questions out of the following questions. The student is to answer any five questions out of the following questions.

**UNIT II**

The student is to answer any five questions out of the following questions. The student is to answer any five questions out of the following questions. The student is to answer any five questions out of the following questions. The student is to answer any five questions out of the following questions. The student is to answer any five questions out of the following questions.

**UNIT III**

The student is to answer any five questions out of the following questions. The student is to answer any five questions out of the following questions. The student is to answer any five questions out of the following questions. The student is to answer any five questions out of the following questions. The student is to answer any five questions out of the following questions.

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o p p t on proto o s

## UNIT IV

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### Practical based on HWN-603

#### Instructions for practical

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#### Suggested Resources for Reading:

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r ss Co un t on n t or n t n s H

r ss D t Co un t ons o F r H

r n p s o r ss t or s v n n n r s n r t rson E u t on

#### References Resources:

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### UNIT-III

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### UNIT-IV

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#### Suggested Resources for Reading:

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- CC out n 2n t n 2 C rt Gu 2 r2r Aut or ▼n. 2 2 D2 ▼
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