

**SPPU In-Sem Offline Examination-April 2022**

Class: BE

Branch : Electronics &amp; Telecommunication

Semester: 2

Subject: Renewable Energy Systems

Code:404194

Maximum Marks: 30

Duration: 60 Minutes

Date : 08/04/2022

Special Instructions:

- 1) Answer Q1 or Q2, Q3 or Q4, Q5 or Q6
- 2) Neat diagrams must be drawn whenever necessary.
- 3) Figure to the right indicates Full marks.
- 4) Assume suitable data if necessary.

| Q. No. | Question / Description   | Marks | CO | BL |
|--------|--|-------|----|----|
| 1a     | Explain the operation of Centralized and Distributed Power Systems in short                                | 5     | 1  | 2  |
| 1b     | Explain the operation of the Thermal Power Plant with a suitable block diagram                             | 5     | 1  | 3  |
|        | <b>OR</b>  |       |    |    |
| 2a     | Write a short note on<br>a) Energy Conservation<br>b) Energy Efficiency                                    | 4     | 1  | 2  |
| 2b     | Discuss about different Renewable energy sources and their potentials                                      | 6     | 1  | 2  |
|        |  |       |    |    |
| 3a     | Discuss the following terms:<br>1. Diffuse Radiation<br>2. Reflected Radiation<br>3. Total Radiation       | 6     | 2  | 3  |
| 3b     | What are the types of Solar Thermal Collectors? Explain the operation of Flat plate type Solar Collectors. | 4     | 2  | 3  |
|        |  |       |    |    |
| 4a     | Explain Spectral Distribution of Solar Radiation. Explain the term Solar Insolation                        | 4     | 2  | 2  |
| 4b     | Explain the operation of Solar Concentrating type Collectors with its types.                               | 6     | 2  | 3  |
|        |  |       |    |    |
| 5a     | Discuss the following with respect to Solar PV System.<br>1) VI characteristics of Solar cell              | 5     | 3  | 3  |

|    |  |   |   |   |
|----|--|---|---|---|
|    | 2) Power of a solar panel  |   |   |   |
| 5b | Explain the use of Solar thermal Energy in Water Distillation applications with suitable block diagram                     | 5 | 3 | 2 |
|    | <b>OR</b>  |   |   |   |
| 6a | Explain the operation of Solar Water heater with suitable block diagram  | 4 | 3 | 2 |
| 6b | Explain the selection criteria for solar panel, Inverter, Battery & Charge controller with the help of suitable case study | 6 | 3 | 4 |

### SPPU In-Sem Offline Examination-April 2022

Class: BE E&TC      Branch: E&TC      Semester-II

Subject: Wireless Sensor Network      (Code: 404192)

Maximum Marks: 30

Duration: 60 Minutes

Date: 8/4/21

Special Instructions:

Answer Q1 or Q2, Q3 or Q4, Q5 or Q6

Neat diagrams must be drawn wherever necessary.

Figures on the right indicate full Marks

Assume suitable data, wherever necessary

| Q. No. | Question / Description   | Marks | CO  |
|--------|--|-------|-----|
| 1a     | <b>Develop and explain</b> the architecture of WSN for environmental monitoring application                            | 5     | CO1 |
| 1b     | <b>Explain</b> the challenges in setting a WSN   | 5     | CO1 |
| OR     |  |       |     |
| 2a     | <b>Explain</b> and propose designer and operational challenges of WSN  | 5     | CO1 |
| 2b     | <b>Compare</b> WSNs Notes for their functionality , specification , manufacturers, range, modulation and Protocol used | 5     | CO1 |
| OR     |  |       |     |
| 3a     | Does CSMA-CA solve the exposed terminal scenario? Draw the scenario and <b>explain</b> in detail                       | 5     | CO2 |
| 3b     | Explain various properties of wireless links?  | 5     | CO2 |
| OR     |  |       |     |
| 4a     | What are metrics of MAC Protocol and <b>explain</b> algorithm for TDMA MAC   | 5     | CO2 |
| 4b     | <b>Explain</b> with examples what are different Error Control Methods  | 5     | CO2 |
| OR     |  |       |     |
| 5a     | <b>Identify and compare</b> WSNs standards used for home applications  | 5     | CO3 |
| 5b     | <b>Draw and Explain</b> the protocol of WSN  | 5     | CO3 |
| OR     |  |       |     |
| 6a     | <b>Compare</b> BLE and ANT .What are the advantages of ANT over BLE  | 5     | CO3 |
| 6b     | <b>Explain</b> IEEE802.15.3 in detail  | 5     | CO3 |

**SPPU In-Sem Offline Examination-April 2022**

Class: BE

Branch: Electronics

Semester: II

Subject: Process Instrumentation (Code: 404210)

Maximum Marks: 30

Duration: 60 Minutes

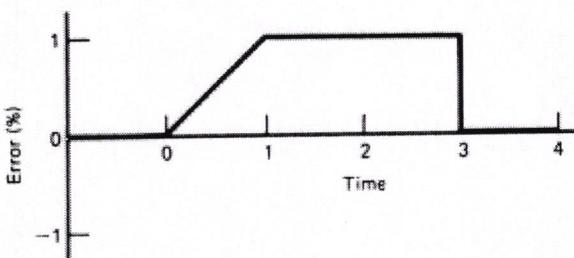
Date: 5/4/2022

**Special Instructions:**

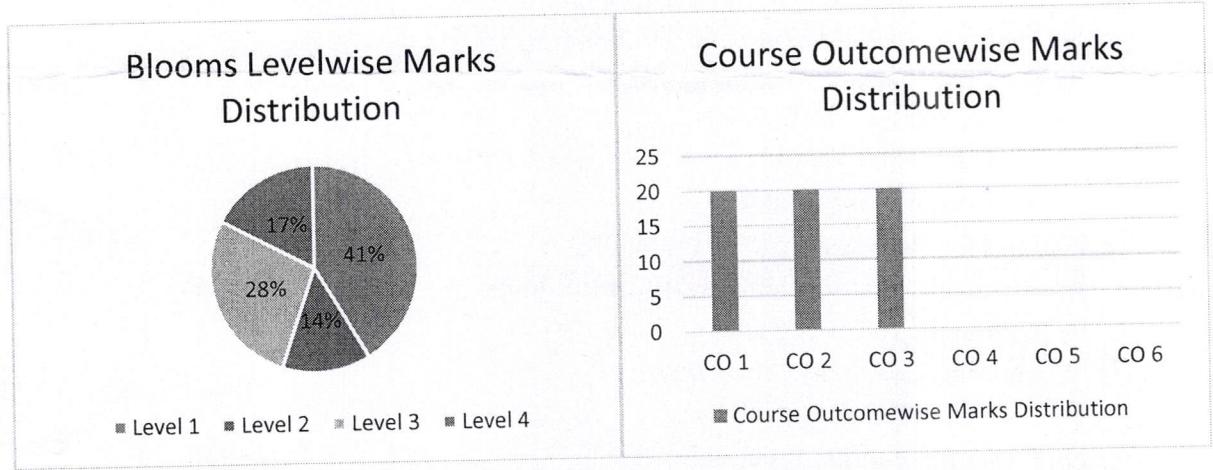
Solve any one from Q. No. 1 and Q. No. 2.

Solve any one from Q. No. 3 and Q. No. 4.

Solve any one from Q. No. 5 and Q. No. 6.

| Q. No. | Question / Description  | Marks | CO | BL | PI    |
|--------|---|-------|----|----|-------|
| 1      | A. With the help of block diagram, explain process control.   | 4     | 1  | 1  | 1.3.1 |
|        | B. Define the following terms<br>a) Controlled variable<br>b) Controlling variable  | 4     | 1  | 1  | 1.3.1 |
|        | C. Explain the terms: Process Equation  | 2     | 1  | 2  | 1.3.1 |
| OR 2   | A. Write on dynamic elements of control loop  | 4     | 1  | 2  | 1.3.1 |
|        | B. Define the following terms<br>a) Single capacity processes<br>b) Self-regulating processes   | 4     | 1  | 1  | 1.3.1 |
|        | C. Explain the terms: Process Load  | 2     | 1  | 2  | 1.3.1 |
| 3      | A. A liquid-level control system linearly converts a displacement of 2 to 3 m into a 4 to 20mA control signal. A relay serves as the two-position controller to open or close an inlet valve. The relay closes at 12 mA and opens at 10 mA. Find<br>(a) The relation between displacement level and current, and<br>(b) The neutral zone or displacement gap in meters. | 8     | 2  | 3  | 1.3.1 |
|        | B. Define the term Control lag  | 2     | 2  | 1  | 1.3.1 |
| OR 4   | A. For the given error, plot a graph of a PI controller output as a function of time. $K_P = 5$ , $K_I = 1.0s^{-1}$ , and $P_I(0) = 20\%$<br><br>  | 10    | 2  | 3  | 1.3.1 |

|      |   |   |   |   |       |
|------|---|---|---|---|-------|
| 5    | A. Differentiate between Electronic and Pneumatic systems   | 5 | 3 | 4 | 2.1.2 |
|      | B. Draw the circuit of electronic Integral mode controller and derive the expression for its output   | 5 | 3 | 1 | 1.3.1 |
| OR 6 | A. Differentiate between Hydraulic and Pneumatic systems  | 5 | 3 | 4 | 2.1.2 |
|      | B. Draw the circuit of electronic Derivative mode controller and derive the expression for its output | 5 | 3 | 1 | 1.3.1 |



BL – Bloom’s (Revised) Taxonomy Levels (1- Remembering, 2- Understanding, 3 – Applying, 4 – Analysing, 5 – Evaluating, 6 - Creating)

BE INSEM APRIL 2022  
BE (E&TC)  
BROADBAND COMMUNICATION SYSTEMS (404190)  
(2015 Pattern) (Semester-II)

Set 1

Time: 1 Hour

Max Marks: 30

Instructions to the candidates:

Date:05/04/22

1. Answer Q. 1 or Q. 2, Q. 3 or Q. 4, Q. 5 or Q. 6
2. Neat diagrams must be drawn wherever necessary
3. Figures to the right indicate full marks
4. Use of logarithmic tables, electronic pocket calculator and steam tables is allowed
5. Assume suitable data, if necessary

| Question Number | Question | Marks  | CO  |     |
|-----------------|----------|--|-----|-----|
| Q. 1            | a)       | A multimode step index fiber has a relative refractive index difference of 1% and a core refractive index of 1.5. The number of modes operating at a wavelength of 1300nm is 1100. Calculate fiber core diameter.  | [6] | CO1 |
|                 | b)       | Explain any four types of losses in optical fiber  | [4] | CO1 |
| <b>OR</b>       |          |  |     |     |
| Q. 2            | a)       | Determine the normalized frequency at 820nm for step index fiber having a core radius of 30 $\mu$ m, $n_1=1.48$ , $n_2=1.46$ . Calculate the number of modes propagating in fiber at 820nm, 1300nm and 1550nm  | [6] | CO1 |
|                 | b)       | Compare PIN photodiode and APD   | [4] | CO1 |
| Q. 3            | a)       | Make a power budget and calculate the maximum transmission distance for a 1300nm light wave system operating at 100Mb/s and using an LED for launching 0.1mW of average power into the fiber. Assume 1 dB/km fiber loss, 0.2db splice loss at every 2km, 1 dB connector loss at each end of fiber link and 100nW receiver sensitivity. Allow 6 dB system margin. | [6] | CO2 |
|                 | b)       | Compare analog and digital point to point optical link with neat sketches.   | [4] | CO2 |
| <b>OR</b>       |          |  |     |     |
| Q. 4            | a)       | Make a rise time budget for a 2km fiber link designed to operate at 20Mb/s. the LED transmitter and the Si PIN receiver have rise times of 8ns and 12ns, respectively. The graded index fiber has material dispersion $D=0.1\text{ns/nm-km}$ and B.W. =35MHz-km. The LED spectral width is 40nm; can the system be designed to operate with NRZ format?          | [6] | CO2 |
|                 | b)       | Enlist the different design considerations for optical link design. What is the significance of Power Budget and Rise time budget?   | [4] | CO2 |

| Question Number | Question   | Marks | CO  |
|-----------------|--|-------|-----|
| Q. 5            | a) A 2 x 2 biconical tapered fiber coupler has an input optical power level of $P_0 = 135 \mu\text{W}$ . The coupler output powers are $P_1 = 60 \mu\text{W}$ , $P_2 = 55 \mu\text{W}$ , $P_3 = 4.3 \text{ nW}$ . Find the four coupling parameters. | [4]   | CO3 |
|                 | b) With neat sketch explain the operation of WDM system. List the advantages of WDM  | [6]   | CO3 |
| <b>OR</b>       |  |       |     |
| Q 6             | a) With neat sketch explain the operation of optical coupler   | [5]   | CO3 |
|                 | b) Write a note on optical isolator  | [5]   | CO3 |

## SPPU In-Sem Offline Examination- April 2022

**Class: BE**

**Branch: Electronics**

**Semester: II**

**Subject: Automotive Electronics (Code: 404211)**

**Maximum Marks: 30**

**Duration: 60 Minutes**

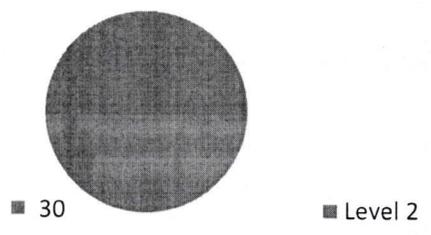
**Date: 7/4/2022**

### Instructions:

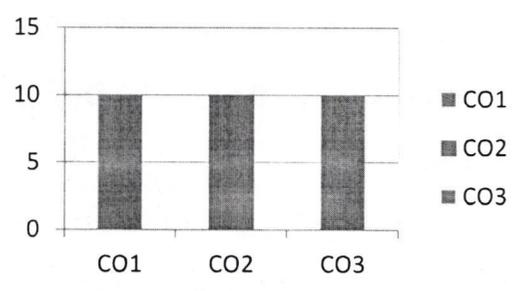
1. Attempt Questions Q1 or Q2, Q3 or Q4....
2. Scientific calculator is allowed wherever necessary
3. Each questions carry 10 marks

| Q.no. | Question / Description   | Marks | CO | BL | PI     |
|-------|--|-------|----|----|--------|
| 1     | a) Compare main control phases of an ABS System  | 6     | 1  | 2  | 2.2.4  |
|       | b) Summarize advantages of electric power steering   | 4     | 1  | 2  | 1.3.1  |
|       | <b>OR</b>  |       |    |    |        |
| 2     | a) Explain the operation of 4-stroke SI engine with the help of a neat diagram   | 6     | 1  | 2  | 1.3.1  |
|       | b) What are the key activities and key players in drill down view of automotive Value chain?                           | 4     | 1  | 2  | 2.2.2  |
|       |  |       |    |    |        |
| 3     | a) Explain signal conditioning and working of solenoid stepper motor as actuator in vehicle.                           | 6     | 2  | 2  | 2.3.1  |
|       | b) Outline the construction of flap type & hot wire type airflow sensor.   | 4     | 2  | 2  | 1.4.1  |
|       | <b>OR</b>  |       |    |    |        |
| 4     | a) State the working principle, Location and applications of wheel speed sensor, EGO sensor, Mass airflow sensor (MAF) | 6     | 2  | 2  | 12.2.2 |
|       | b) Describe Engine calibration and Dynamometer   | 4     | 2  | 2  | 12.1.1 |
|       |  |       |    |    |        |
| 5     | a) Explain microcontroller based cruise control with suitable block diagram.   | 6     | 3  | 2  | 1.3.1  |
|       | b) What is engine mapping? Explain fuel mapping?   | 4     | 3  | 2  | 1.3.1  |
|       | <b>OR</b>  |       |    |    |        |
| 6     | a) State various sensors used for stability control. Explain working of it.  | 6     | 3  | 2  | 1.3.1  |
|       | b) Compare various types of automotive grade processors.   | 4     | 3  | 2  | 2.2.4  |

Blooms Texanomy level outcome wise marks distribution



Course outcome wise marks distribution



## SPPU In-Sem Offline Examination-April 2022

Class: BE

Branch : Electronics

Semester: 2

Subject: Renewable Energy System and DSM

Code:404212

Maximum Marks: 30

Duration: 60 Minutes

Date : 08/04/2022

Special Instructions:

- 1) Answer Q1 or Q2, Q3 or Q4, Q5 or Q6
- 2) Neat diagrams must be drawn whenever necessary.
- 3) Figure to the right indicates Full marks.
- 4) Assume suitable data if necessary.

| Q. No.    | Question / Description  | Marks | CO | BL |
|-----------|---|-------|----|----|
| 1a        | Discuss the following with respect to Solar PV System.<br>1) VI characteristics of Solar cell<br>2) Power of a solar panel  | 4     | 1  | 2  |
| 1b        | Explain the selection criteria for solar panel, Inverter, Battery & Charge controller with the help of suitable case study. | 6     | 1  | 4  |
| <b>OR</b> |   |       |    |    |
| 2a        | What are the different components of a typical PV system? Explain their role in short.                                      | 6     | 1  | 3  |
| 2b        | Explain the applications of solar power systems in water pumping applications.  | 4     | 1  | 2  |
| <b>OR</b> |   |       |    |    |
| 3a        | Draw and explain characteristics of Power vs speed and TSR. Explain Maximum power operation of wind power system.           | 6     | 2  | 3  |
| 3b        | Explain following mechanical controls used in Wind Energy Conversion System (WECS)<br>i) Pitch Control<br>ii) Yaw Control   | 4     | 2  | 2  |
| <b>OR</b> |   |       |    |    |
| 4a        | Explain the principle of wind energy conversion system . State the basic Components of WECS and their role in WECS.         | 6     | 2  | 2  |
| 4b        | Compare fixed speed and variable speed wind power systems.  | 4     | 2  | 4  |

|    |   |   |   |   |
|----|---|---|---|---|
|    |   |   |   |   |
| 5a | What are biomass conversion technologies? Explain any one in detail                           | 5 | 3 | 2 |
| 5b | With suitable sketch explain an anaerobic digestion method of producing biogas from resources | 5 | 3 | 2 |
|    | <b>OR</b>   |   |   |   |
| 6a | Explain Pyrolysis Process for Biomass Energy Conversion                                       | 5 | 3 | 2 |
| 6b | Explain the operation of Biofuel Production with the help of suitable schematic diagram       | 5 | 3 | 2 |

**SPPU In-Sem Offline Examination- April 2022**

Class: BE

Branch: Electronics

Semester: II

Subject: Artificial Intelligence and Machine Learning (Elective III)(Code): 404211

Maximum Marks: 30

Duration: 60 Minutes

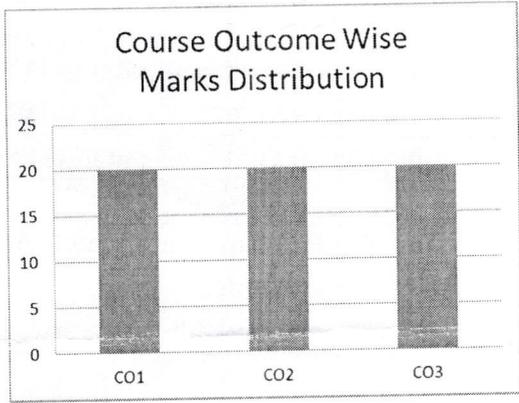
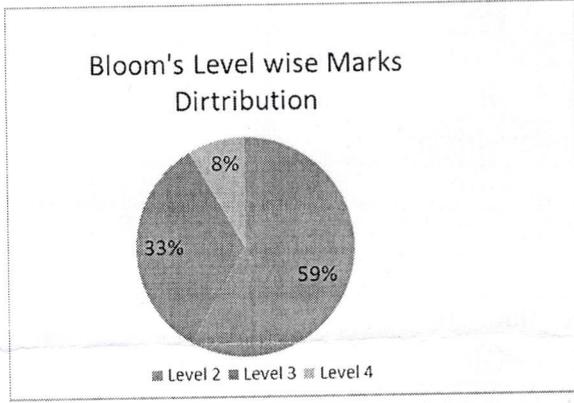
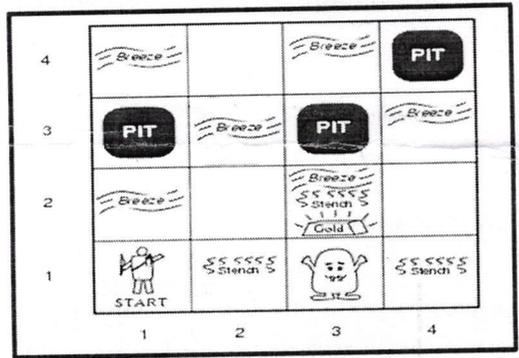
Date: 08/04/2022

*Instruction:*

1. Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6
2. Neat Diagram must be drawn wherever necessary

| Q. No. | Question / Description  | Marks | CO | BL | PI    |   |   |   |   |   |  |   |   |   |   |   |   |   |   |   |   |   |       |
|--------|---|-------|----|----|-------|---|---|---|---|---|--|---|---|---|---|---|---|---|---|---|---|---|-------|
| 1.     | a. What is Artificial intelligence? Explain any four applications of AI   | 5     | 1  | 2  | 2.1.2 |   |   |   |   |   |  |   |   |   |   |   |   |   |   |   |   |   |       |
|        | b. What are different intelligent agents in AI? Explain any two in detail   | 5     | 1  | 2  | 2.1.1 |   |   |   |   |   |  |   |   |   |   |   |   |   |   |   |   |   |       |
| OR     |   |       |    |    |       |   |   |   |   |   |  |   |   |   |   |   |   |   |   |   |   |   |       |
| 2.     | a. State the types of environment of AI agent? Explain any two types of environment in detail   | 5     | 1  | 2  | 1.2.1 |   |   |   |   |   |  |   |   |   |   |   |   |   |   |   |   |   |       |
|        | b. Derive the PEAS parameters for Self driving car  | 5     | 1  | 3  | 1.3.1 |   |   |   |   |   |  |   |   |   |   |   |   |   |   |   |   |   |       |
| OR     |   |       |    |    |       |   |   |   |   |   |  |   |   |   |   |   |   |   |   |   |   |   |       |
| 3.     | a. Explain depth first search algorithm with the help of any example.   | 5     | 2  | 2  | 1.4.1 |   |   |   |   |   |  |   |   |   |   |   |   |   |   |   |   |   |       |
|        | b. Explain breadth first search algorithm with example  | 5     | 2  | 2  | 1.4.1 |   |   |   |   |   |  |   |   |   |   |   |   |   |   |   |   |   |       |
| OR     |   |       |    |    |       |   |   |   |   |   |  |   |   |   |   |   |   |   |   |   |   |   |       |
| 4.     | a. Explain A* algorithm with the help of suitable example   | 5     | 2  | 3  | 1.4.1 |   |   |   |   |   |  |   |   |   |   |   |   |   |   |   |   |   |       |
|        | b. Formulate the 8 puzzle problem as a search problem. Write formulation stages (5) BT 4 <ul style="list-style-type: none"> <li>• States?</li> <li>• Actions?</li> <li>• Goal test?</li> <li>• Path cost?</li> </ul> <div style="text-align: center; margin-top: 10px;"> <table border="1" style="display: inline-table; margin-right: 20px;"> <tr><td>8</td><td></td><td>6</td></tr> <tr><td>5</td><td>4</td><td>7</td></tr> <tr><td>2</td><td>3</td><td>1</td></tr> </table> <table border="1" style="display: inline-table;"> <tr><td></td><td>1</td><td>2</td></tr> <tr><td>3</td><td>4</td><td>5</td></tr> <tr><td>6</td><td>7</td><td>8</td></tr> </table> </div> <p style="text-align: center; margin-top: 5px;">Start State                      Goal State</p> | 8     |    | 6  | 5     | 4 | 7 | 2 | 3 | 1 |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 5 | 2 | 4 | 2.1.2 |
| 8      |   | 6     |    |    |       |   |   |   |   |   |  |   |   |   |   |   |   |   |   |   |   |   |       |
| 5      | 4   | 7     |    |    |       |   |   |   |   |   |  |   |   |   |   |   |   |   |   |   |   |   |       |
| 2      | 3   | 1     |    |    |       |   |   |   |   |   |  |   |   |   |   |   |   |   |   |   |   |   |       |
|        | 1   | 2     |    |    |       |   |   |   |   |   |  |   |   |   |   |   |   |   |   |   |   |   |       |
| 3      | 4   | 5     |    |    |       |   |   |   |   |   |  |   |   |   |   |   |   |   |   |   |   |   |       |
| 6      | 7   | 8     |    |    |       |   |   |   |   |   |  |   |   |   |   |   |   |   |   |   |   |   |       |
| OR     |   |       |    |    |       |   |   |   |   |   |  |   |   |   |   |   |   |   |   |   |   |   |       |
| 5.     | a. Explain knowledge base and reasoning for AI agent  | 5     | 3  | 2  | 1.4.1 |   |   |   |   |   |  |   |   |   |   |   |   |   |   |   |   |   |       |
|        | b. Explain the term logic, Syntax and semantic for knowledge representation   | 5     | 3  | 2  | 1.4.1 |   |   |   |   |   |  |   |   |   |   |   |   |   |   |   |   |   |       |

| OR |  |   |   |   |       |
|----|--|---|---|---|-------|
| 6. | a. Write short note on entailment in the propositional logic | 5 | 3 | 2 | 1.4.1 |
|    | b. Derive Wumpus World PEAS description                      | 5 | 3 | 3 | 1.3.1 |



BL - Bloom's (Revised) Taxonomy Levels (1- Remembering, 2- Understanding, 3 - Applying, 4 - Analyzing, 5 - Evaluating, 6 - Creating)

PO - Program Outcomes; PI Code - Performance Indicator Code

**SPPU INSEM OFFLINE EXAMINATION APRIL -2022**

Class:- BE(E&TC)

Branch:- E&TC

Semester:- II

Subject: - Soft computing and Deep learning

Code (410303)

Maximum Marks:- 30

Duration:-1Hrs

Date:- 11/4/2022

Special Instructions:-

- 1) Neat diagrams must be drawn whenever necessary.
- 2) Figure to the right indicate Full marks.
- 3) Assume suitable data if necessary.
- 4) Use of scientific calculator is allowed

| Q.NO      | QUESTION   | MARKS |
|-----------|--|-------|
| 1(a)      | Elaborate in detail about the need of soft computing? What is the difference between hard and soft computing?  | 5     |
| 1(b)      | What are the different areas of where we can use soft computing? Explain with suitable example.  | 5     |
| <b>OR</b> |  |       |
| 2(a)      | What are the different soft computing techniques available? Explain in brief.  | 5     |
| 2(b)      | Explain in brief with example the current trends in soft computing.  | 5     |
| 3(a)      | Illustrate with example, operation on classical set, properties of classical set and mapping of classical set to function  | 5     |
| 3(b)      | With reference to features of membership function interpret, illustrate and explain the following terms: Core, support and boundaries. Also explain normal fuzzy set and convex fuzzy set. | 5     |
| <b>OR</b> |  |       |
| 4(a)      | What is fuzzy set? Explain the operation and properties of fuzzy set. Also explain alternative fuzzy set operations.   | 5     |
| 4(b)      | With suitable example explain fuzzy rule based system. Explain Aggregation of fuzzy rules.   | 5     |
| 5(a)      | Explain the important biological terms and its relevance to understand Genetic algorithm? (e.g. Chromosomes, alleles, diploid, haploid etc.)   | 5     |
| 5(b)      | Explain the operators used in Genetic algorithm.   | 5     |
| <b>OR</b> |  |       |
| 6(a)      | Explain Genetic algorithms to evolve strategies for the Prisoner's Dilemma.  | 5     |
| 6(b)      | Explain in brief two applications of Genetic Algorithm in machine learning.  | 5     |

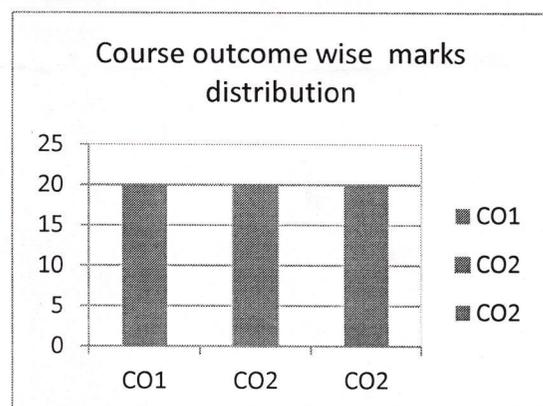
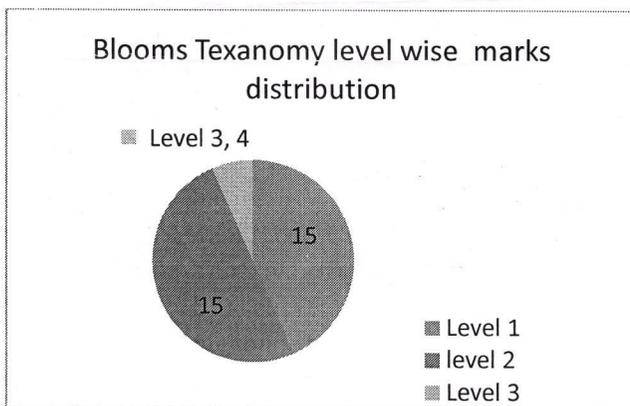
**SPPU In-Sem Offline Examination on- April 2022**

**Class : BE      Branch:Electronics      Semester:VIII**

**Subject: Computer Network & Security      (Code ):404209**

**Maximum Marks: 30      Duration: 60 Minutes      Date:4/4/2022.**

| Q.No. | Question/Description  | Marks | CO | BL | PI    |
|-------|---|-------|----|----|-------|
| 1     | a) Draw TCP/IP Model List & explain functions of each layer.  | 6     | 1  | 1  | 1.3.1 |
|       | b) Explain Addressing types in computer Network   | 4     | 1  | 2  | 1.3.1 |
| OR    |   |       |    |    |       |
| 2     | a) State and explain basic network topologies & write advantages and applications of each.                                  | 6     | 1  | 2  | 1.3.1 |
|       | b) Explain different service primitives   | 4     | 1  | 1  | 1.3.1 |
| 3     | a) Compare the circuit switching and datagram switching.  | 6     | 2  | 2  | 1.3.1 |
|       | b) What is purpose of satellite network & hence Distinguish LEO/MEO/GEO   | 4     | 2  | 1  | 1.3.1 |
| OR    |   |       |    |    |       |
| 4     | a) Discuss & compare guided & unguided transmission media in detail   | 6     | 2  | 2  | 1.3.1 |
|       | b) Calculate the upper limit for better performance & maximum bit rate for a channel having BW 3.6 KHz and S/N ratio 22 dB. | 4     | 2  | 3  | 1.1.1 |
| 5.    | a) Explain HDLC protocol in detail.   | 6     | 3  | 1  | 1.3.1 |
|       | b) Discuss flow control & error control mechanism?  | 4     | 3  | 2  | 1.3.1 |
| OR    |   |       |    |    |       |
| 6.    | a) Explain non-persistent-persistent & 1 persistent CSMA protocols  | 6     | 3  | 1  | 1.3.1 |
|       | b) Explain difference between switch, router & gateway  | 4     | 3  | 2  | 1.3.1 |



BL – Bloom's (Revised) Taxonomy Levels (1- Remembering, 2- Understanding, 3 –

Applying, 4 – Analysing, 5 – Evaluating, 6 - Creating)

**SPPU In-Sem Offline Examination-April 2022****Set A**

Class: BE    Branch: E &amp; TC    Semester: 8

Subject: **Mobile Communication** (Code: 404189)

Maximum Marks: 30

Duration: 60 Minutes

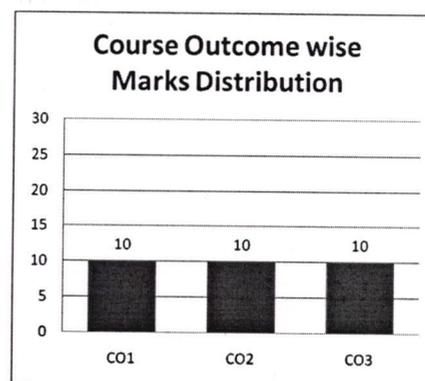
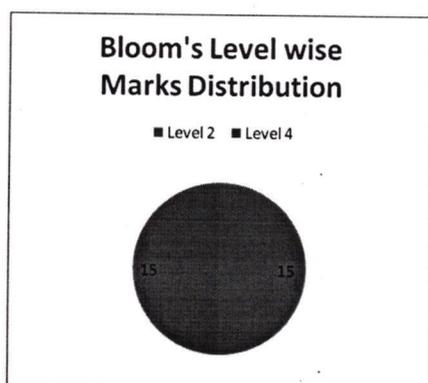
Date: 04.04.2022

**Special Instructions:**

- 1) Attempt Questions Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6.
- 2) Neat diagrams must be drawn wherever necessary.

| Q. No. | Question   | Marks | CO | BL | PI    |
|--------|--|-------|----|----|-------|
| 1 a)   | Calculate availability of a dual processor system for a period of 20 years if it's MTBF = 3300 Hrs & MTTR = 6 Hrs.   | 4     | 1  | 4  | 2.1.2 |
| 1 b)   | State & explain switching functions of a switching system.   | 6     | 1  | 2  | 1.3.1 |
|        | <b>OR</b>  |       |    |    |       |
| 2 a)   | Design a two stage network for connecting 200 incoming trunks to 200 outgoing trunks & find number of crosspoints.   | 6     | 1  | 4  | 3.2.3 |
| 2 b)   | Compare circuit switching with package switching.  | 4     | 1  | 2  | 1.3.1 |
|        |  |       |    |    |       |
| 3 a)   | During the busy hour, 1200 calls were offered to a group of trunks & 6 calls were lost. The average call duration was 3 minutes. Find:<br>i. The traffic offered<br>ii. The traffic carried<br>iii. The traffic lost<br>iv. The grade of service<br>v. The total duration of the periods of congestion | 5     | 2  | 4  | 2.1.2 |
| 3 b)   | With a neat sketch explain the concept of PCM signalling.  | 5     | 2  | 2  | 1.3.1 |
|        | <b>OR</b>  |       |    |    |       |
| 4 a)   | With a neat sketch explain the concept of common channel signalling.   | 6     | 2  | 2  | 1.3.1 |
| 4 b)   | On average, one call arrives every 5 seconds. During a period of 10 seconds, what is the probability that:<br>i. No call arrives?<br>ii. One call arrives?<br>iii. Two calls arrive?<br>iv. More than two calls arrive?  | 4     | 2  | 4  | 2.1.2 |
|        |  |       |    |    |       |
| 5 a)   | A spectrum of 30 MHz is allocated to a wireless FDD cellular system which uses two 25 kHz simplex channels to provide full duplex voice & control channels, compute the number of  | 6     | 3  | 4  | 1.4.1 |

|           |   |   |   |   |       |
|-----------|---|---|---|---|-------|
|           | channels available per cell if a system uses a). four cell reuse, b). seven cell reuse. If 1 MHz of the allocated spectrum is dedicated to control channels, determine an equitable distribution of control channels & voice channels in each cell for each of the two systems. |   |   |   |       |
| 5 b)      | Explain sectoring techniques of improving coverage & capacity of cellular networks with a suitable diagram.   | 4 | 3 | 2 | 1.3.1 |
| <b>OR</b> |   |   |   |   |       |
| 6 a)      | For given path loss exponent $n=4$ & frequency reuse factor $N=7$ , calculate S/I ratio in dB for cellular system.  | 6 | 3 | 4 | 1.4.1 |
| 6 b)      | Describe the concept of frequency reuse with suitable diagram.  | 4 | 3 | 2 | 1.3.1 |



BL – Bloom's (Revised) Taxonomy Levels (1- Remembering, 2- Understanding, 3 – Applying, 4 – Analysing, 5 – Evaluating, 6 - Creating)

**SPPU In-Sem Offline Examination-April 2022**

Class: BE

Branch: Electronics

Semester: II

Subject: Process Instrumentation (Code: 404210)

Maximum Marks: 30

Duration: 60 Minutes

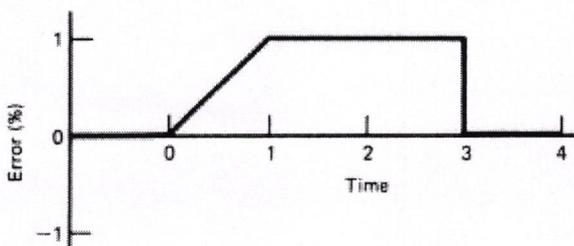
Date: 5/4/2022

**Special Instructions:**

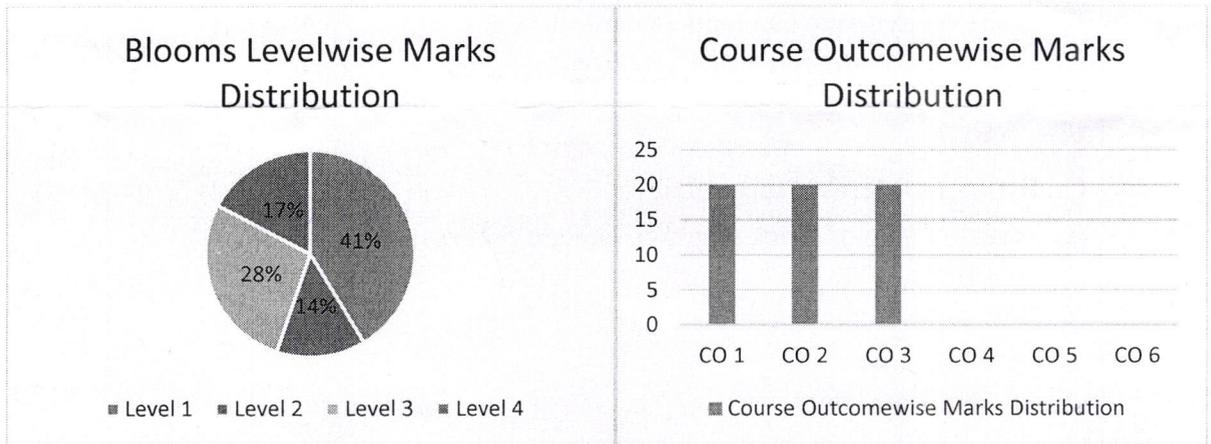
Solve any one from Q. No. 1 and Q. No.2.

Solve any one from Q. No. 3 and Q. No.4.

Solve any one from Q. No. 5 and Q. No.6.

| Q. No. | Question / Description  | Marks | CO | BL | PI    |
|--------|---|-------|----|----|-------|
| 1      | A. Write on dynamic elements of control loop  | 4     | 1  | 2  | 1.3.1 |
|        | B. Define the following terms<br>a) Interacting processes<br>b) Self-regulating processes   | 4     | 1  | 1  | 1.3.1 |
|        | C. Explain the terms: Process Lag   | 2     | 1  | 2  | 1.3.1 |
| OR 2   | A. With the help of block diagram, explain process control.   | 4     | 1  | 1  | 1.3.1 |
|        | B. Define the following terms<br>a) Dead time<br>b) Time constant   | 4     | 1  | 1  | 1.3.1 |
|        | C. Explain the terms: Process Equation  | 2     | 1  | 2  | 1.3.1 |
| 3      | A. For the given error, plot a graph of a PI controller output as a function of time. $K_P = 5$ , $K_I = 1.0s^{-1}$ , and $P_1(0) = 20\%$<br><br>  | 10    | 2  | 3  | 1.3.1 |
| OR 4   | A. A liquid-level control system linearly converts a displacement of 2 to 3 m into a 4 to 20mA control signal. A relay serves as the two-position controller to open or close an inlet valve. The relay closes at 12 mA and opens at 10 mA. Find<br>(a) The relation between displacement level and current, and<br>(b) The neutral zone or displacement gap in meters. | 8     | 2  | 3  | 1.3.1 |
|        | B. Define the term Control parameter range  | 2     | 2  | 1  | 1.3.1 |

|             |   |   |   |   |       |
|-------------|---|---|---|---|-------|
| <b>5</b>    | A. Differentiate between Electronic and Pneumatic systems   | 5 | 3 | 4 | 2.1.2 |
|             | B. Draw the circuit of electronic Integral mode controller and derive the expression for its output     | 5 | 3 | 1 | 1.3.1 |
| <b>OR 6</b> | A. Differentiate between Hydraulic and Pneumatic systems  | 5 | 3 | 4 | 2.1.2 |
|             | B. Draw the circuit of electronic Proportional mode controller and derive the expression for its output | 5 | 3 | 1 | 1.3.1 |



BL – Bloom’s (Revised) Taxonomy Levels (1- Remembering, 2- Understanding, 3 – Applying, 4 – Analysing, 5 – Evaluating, 6 - Creating)

## SPPU In-Sem Offline Examination- April 2022

**Class: BE**

**Branch: Electronics**

**Semester: II**

**Subject: Automotive Electronics (Code: 404211)**

**Maximum Marks: 30**

**Duration: 60 Minutes**

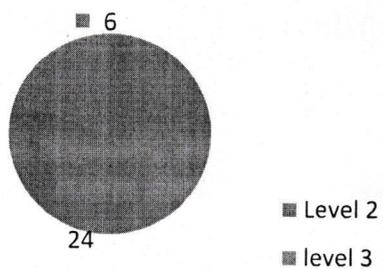
**Date: 7/4/2022**

### Instructions:

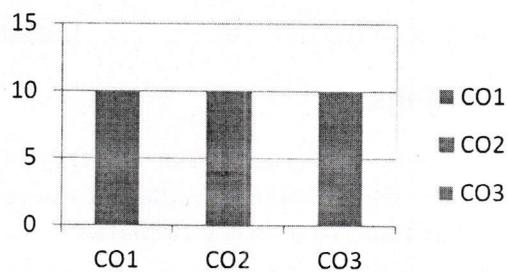
1. Attempt Questions Q1 or Q2, Q3 or Q4....
2. Scientific calculator is allowed wherever necessary
3. Each questions carry 10 marks

| Q.no. | Question / Description  | Marks | CO | BL | PI    |
|-------|---|-------|----|----|-------|
| 1     | a) Explain various components of engine   | 6     | 1  | 2  | 1.3.1 |
|       | b) Discuss Electronics Ignition system  | 4     | 1  | 2  | 1.3.1 |
|       | <b>OR</b>   |       |    |    |       |
| 2     | a) Compare power steering and manual steering   | 6     | 1  | 2  | 2.2.4 |
|       | b) List stages in development of ECU & different types of ECU                           | 4     | 1  | 2  | 2.1.2 |
|       |   |       |    |    |       |
| 3     | a) Sketch & Describe working of Engine Gas Oxygen Sensor.                               | 6     | 2  | 3  | 2.1.2 |
|       | b) Outline the construction of Mass airflow sensor.                                     | 4     | 2  | 2  | 1.3.1 |
|       | <b>OR</b>   |       |    |    |       |
| 4     | a) Explain with suitable diagram Throttle plate angular position sensor                 | 6     | 2  | 2  | 1.3.1 |
|       | b) What is selection criteria for selecting sensor for vibration measurement in vehicle | 4     | 2  | 3  | 2.1.2 |
|       |   |       |    |    |       |
| 5     | a) Describe architecture of Infineon's tri-core family of automotive processor.         | 6     | 3  | 2  | 1.3.1 |
|       | b) Explain Engine mapping in brief  | 4     | 3  | 2  | 1.3.1 |
|       | <b>OR</b>   |       |    |    |       |
| 6     | a) Compare 16-bit and 32-bit controller from automotive perspective                     | 6     | 3  | 2  | 2.2.4 |
|       | b) Write a note on lookup table & need of maps  | 4     | 3  | 2  | 2.1.1 |

Blooms Taxonomy level outcome wise marks distribution



Course outcome wise marks distribution



### SPPU In-Sem Offline Examination-April 2022

Class: BE

Branch : Electronics

Semester: 2

Subject: Renewable Energy System and DSM

Code:404212

Maximum Marks: 30

Duration: 60 Minutes

Date : 08/04/2022

#### Instructions:

- 1) Answer Q1 or Q2, Q3 or Q4, Q5 or Q6
- 2) Neat diagrams must be drawn whenever necessary.
- 3) Figure to the right indicates Full marks.
- 4) Assume suitable data if necessary.

| Q. No. | Question / Description  | Marks | CO | BL |
|--------|---|-------|----|----|
| 1a     | With the help of neat block diagram explain the operation of a Stand alone PV System  | 5     | 1  | 2  |
| 1b     | Explain the applications of solar power systems in water pumping applications.  | 5     | 1  | 2  |
|        | <b>OR</b>   |       |    |    |
| 2a     | With the help of neat block diagram explain the operation of a Hybrid PV System   | 4     | 1  | 3  |
| 2b     | Explain Following terms with the help of VI characteristics of Solar cells.<br>i) Open Circuit Voltage<br>ii) Short Circuit Current<br>iii) Maximum Power Point operation | 6     | 1  | 2  |
|        |   |       |    |    |
| 3a     | Explain different types of speed control methods used in a typical Wind Energy Conversion System(WECS).   | 6     | 2  | 2  |
| 3b     | Compare Vertical and horizontal wind power systems.   | 4     | 2  | 4  |
|        | <b>OR</b>   |       |    |    |
| 4a     | Explain the working of standalone and grid connected wind power systems with suitable block diagrams.   | 6     | 2  | 2  |
| 4b     | Explain different environmental issues created by Wind Power Systems.   | 4     | 2  | 2  |
|        |   |       |    |    |
| 5a     | What are biomass conversion technologies? Explain any one in detail   | 6     | 3  | 2  |

|    |  |   |   |   |
|----|--|---|---|---|
| 5b | Explain Municipal Solid Waste Management in Short.   | 4 | 3 | 2 |
|    | <b>OR</b>  |   |   |   |
| 6a | What is the origin of biomass energy? Name the raw materials which can be used for production of different biomass energy forms(Solid/Liquid/Gas). | 5 | 3 | 2 |
| 6b | With suitable sketch explain an anaerobic digestion method of producing biogas from resources  | 5 | 3 | 3 |

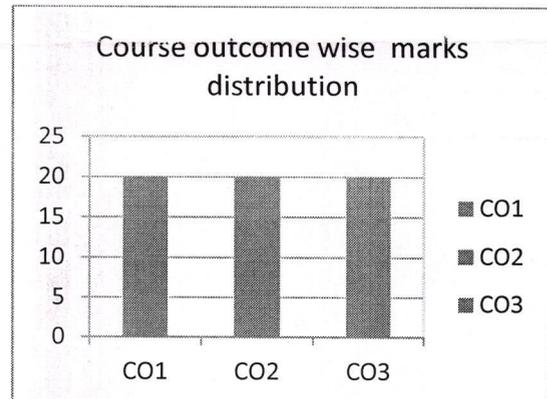
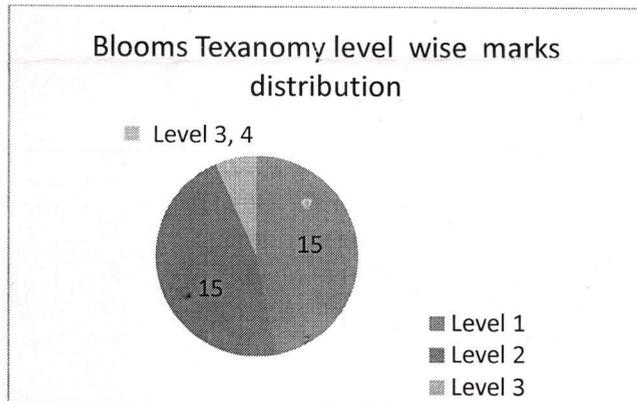
**SPPU In-Sem Offline Examination on- April 2022**

**Class : BE      Branch: Electronics      Semester: VIII**

**Subject: Computer Network & Security      (Code ):404209**

**Maximum Marks: 30      Duration: 60 Minutes      Date:4/4/2022**

| Q.No. | Question/Description   | Marks | CO | BL | PI    |
|-------|--|-------|----|----|-------|
| 1     | a)Draw ISO-OSI Model List &explain functions of each layer.  | 6     | 1  | 1  | 1.3.1 |
|       | b)Explain Addressing types in computer Network with example.   | 4     | 1  | 2  | 1.3.1 |
| OR    |  |       |    |    |       |
| 2     | a)State and explain basic network topologies & write advantages and applications of each.                                      | 6     | 1  | 2  | 1.3.1 |
|       | b)Explain different service primitives   | 4     | 1  | 1  | 1.3.1 |
| 3     | a) What is switching? Explain packet switching .   | 6     | 2  | 1  | 1.31  |
|       | b)What is purpose of satellite network & hence Distinguish LEO/MEO/GEO   | 4     | 2  | 2  | 1.31  |
| OR    |  |       |    |    |       |
| 4     | a)Discuss & compare guided & unguided transmission media in detail   | 6     | 2  | 2  |       |
|       | b)We have a channel with a 1 MHz bandwidth. The SNR for this channel is 63; what is the appropriate bit rate and signal level? | 4     | 2  | 3  | 1.1.1 |
| 5     | a)Explain PPP protocol in detail.  | 6     | 3  | 1  | 1.3.1 |
|       | b)Discuss flow control & error control mechanism?  | 4     | 3  | 2  |       |
| OR    |  |       |    |    |       |
| 6     | a)Explain Sliding window Protocol in detail.   | 6     | 3  | 1  | 1.3.1 |
|       | b)Explain difference between switch, router & gateway  | 4     | 3  | 2  | 1.3.1 |



BL – Bloom's (Revised) Taxonomy Levels (1- Remembering, 2- Understanding, 3 – Applying, 4 – Analysing, 5 – Evaluating, 6 - Creating)