

**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**INNOVATIVE ASSIGNMENTS**

**ACADEMIC YEAR: 2022-2023 SEM-II**

 **SOFTWARE ENGINEERING II YEAR II SEM**

1. **Analyze different software development life cycles** (Waterfall, Agile, Spiral) for building a fintech app and recommend the most suitable one.**(CO1)**
2. **Design a testing framework** for an AI-based recommendation engine, considering unit, integration, and performance testing.**(CO4)**

**COMPUTER ORIENTED STATISTICAL METHODS II YEAR II SEM**

1. A businessman goes to hotels X, Y, Z 20%, 50%, 30% of the time respectively. It is known that 5%, 4%, 8% of the rooms in X, Y, Z hotels have faulty plumbing. **What** is the probability that business man’s room having faulty plumbing is assigned to hotel Z. **(CO1)**

2. The probability density function of a variate X is

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| X | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| P(X) | $$k$$ | $$3k$$ | $$5k$$ | $$7k$$ | $$9k$$ | $$11k$$ | $$13k$$ |

 **Find**

i) $P\left(X<4\right),P\left(X\geq 5\right),P(3<x\leq 6)$

 ii) **What** will be the minimum value of k so that $P\left(X\leq 2\right)>0.3?$ **(CO1)**

3. Using recurrence formula **find** the probabilities when x=0, 1, 2, 3, 4 and 5; if the mean of passion distribution is 3. **(CO2)**

4. Samples of size 2 are taken from the population 3,6,9,15,27 with replacement. **Find**

 a) The mean of the population.

 b) The standard deviation of the population.

 c) The mean of the sampling distribution of means and

 d) The standard deviation of the sampling distribution of means. **(CO3)**

5. The marks obtained in Statistics in a certain examination found to be normally distributed. If 15% of the students greater than or equal to 60 marks, 40% less than 30 marks. **Find** the mean and standard deviation. **(CO3)**

 **ANALOG AND DIGITAL ELECTRONICS II YEAR II SEM**

**Set-1**

1. **Explain** about RC coupled amplifier and **sketch** the frequency response plot of an RC coupled amplifier. **(CO2)**

2. A transistor operating in CB configuration has IC=2.98 mA , IE=3.00 mA and ICO=0.01 mA. **What** current will flow in the collector circuit of this transistor **when** connected in CE configuration with a base current of 30µA. **(CO2)**

3. Derive the expression for Avs,Ais,Ri,RO of transistor amplifier using CB configuration. **(CO2)**

4. **Discuss** any two applications of FET. **(CO1)**

**Set-2**

1. **How** does the Reverse Saturation Current of a diode varies with temperature? **Explain**. **(CO1)**

2. **What** is Comparator Circuit?**How** does such a circuit differs from clipping circuit.**(CO1)**

3. **What** is early effect? **Explain why** it is called BASE WIDTH MODULATION?**Discuss** its consequences in transistors in detail. **(CO2)**

4. With neat **sketch**,**explain** the voltage divider bias circuit with operating point. **(CO2)**

 **PYTHON PROGRAMMING II YEAR II SEM**

1. **Design a GUI-based application** using Tkinter or PyQt for a school timetable manager or student feedback system.**(CO4)**
2. **Create a mini Python package/library** (e.g., for data visualization, file encryption, or time tracking) with proper documentation and packaging. **(CO1)**

 **COMPILER DESIGN III YEAR II SEM**

1.**Create a mini programming language** with its own syntax and semantics (e.g., a language for basic math operations or drawing shapes), and **define** its grammar using BNF/EBNF. **(CO2)**

2.**Analyze error recovery techniques** in parsing, and apply them to a sample buggy input for a given grammar. **(CO2)**

 **WEB TECHNOLOGIES III YEAR II SEM**

1. Print a calendar for the month of March 2008.Display all Sundays in Red color, the holidays other than Sunday in Blue color and the rest in green color. **(CO2)**
2. **Write** a HTML page to display information of three products. The name of three products should be displayed at the top. The hyperlink should be provided to move to the details of the product like its features,size,price etc., along with its image. The link should be internal link. **(CO2)**
3. Code Implementation & amp; **Write** up Online Art Gallery by using PHP. **(CO1)**

 **MACHINE LEARNING III YEAR II SEM**

* + - 1. **Design** a Custom Machine Learning Pipeline. **(CO1)**
			2. **Design** a machine learning workflow to detect fraudulent transactions in financial systems. Include steps for data collection, preprocessing, model training, and real-time prediction.**(CO2,3)**

 **HUMAN COMPUTER INTERACTION IV YEAR II SEM**

1. The future of HCI: Unveiling a world beyond our wildest dreams. **(CO3)**
2. Case Study: WOOD **(CO5)**

 **MEASURING INSTRUMENTS IV YEAR II SEM**

1. The expected value of the voltage across a resistor is 80v. However, the measurement gives a value of 79v. Calculate (i) absolute error (ii) % error (iii) relative accuracy and (iv) % of accuracy **(CO2)**
2. A voltmeter having a sensitivity of 1 kΩ/v is connected across an unknown resistance in series with a millimeter reading 80v on 150v scale. **When** the milliammeter reading 10mA.Calculate

(i) Apparent resistance of the unknown resistance

(ii) Actual resistance of the unknown resistance and

(iii) Error due to the loading effect of the voltmeter. If the milliammeter reads 600mA and the voltmeter reads 30v on a 150v scale.

(iv) Apparent resistance of the unknown resistance

(v) Actual resistance of the unknown resistance.

(vi) Error due to loading effect of the voltmeter. **(CO1)**

1. For the following given data, calculate
2. Arithmetic mean
3. Deviation of each value
4. Algebraic sum of the deviations
5. Average deviation
6. Standard deviation**(CO2)**
7. A voltmeter reading 70v on its 100v range and an ammeter reading 80mA on its 150mA range are used to **determine** the power dissipated in a resistor. Both these instruments are guaranteed to be accurate within + 1.5% at full scale deflection. **Determine** the limiting error of the power.**(CO1)**
8. Applications of Resistive Sensors, Capacitive Sensor and Inductor Sensor.**(CO3)**