

Gandhi Institute of Engineering & Technology University, Gunupur - 765022
 B. Tech (Third Semester)
CYCLE TEST - I
AIES (CSE-AIML)
[23BCMPE23011]



Time: 75 Minutes

Maximum: 30 Marks

(The figures in the right hand margin indicate marks.)

(2 x 5 = 10 Marks)**PART - A****Q.1. Answer ALL questions**

- a. What are the applications of Artificial Intelligence? CO1 1
- b. Differentiate between strong AI and weak AI? CO1 2
- c. Define Search State in AI CO1 1
- d. Define the ways to Represent the Knowledge CO2 2
- e. Differentiate between Propositional & Predicate Logical Representation with Example. CO2 2

PART - B**Answer ALL Questions****(10 x 2 = 20 Marks)**

- 2.a. Define AI, Explain its Application in different areas. 5 CO1 2
- b. Define Problem Space, Explain about types of Search Algorithm in AI. 5 CO1 2

(OR)

- c. Write down the mathematical way & Generate the optimal solution of representing Water Jug problem in AI? We have two jugs of capacity 4L and 3L. How can we get 2L of water in the jugs with minimum steps? 7 CO1 3
- d. Define production system in AI. What are the features of a production system? Briefly explain production system characteristics. 3 CO1 2
- 3.a. Explain in Details about Types of Knowledge Representation in AI with Example. 5 CO2 2
- b. Briefly explain about Knowledge cycle with Diagram. 5 CO2 2

(OR)

- c. Explain briefly about Architecture of Knowledge Based Agent with block diagram 5 CO2 3
- d. What do you mean Semantic Network Knowledge Representation? Consider the following Knowledge Base:

- b) Jerry is a cat. b) Jerry is a mammal
- d) Jerry is owned by Priya. d) Jerry is brown colored.
- f) All Mammals are animal.

5 CO2 3

Define ISA & Kind-of Relation from the given knowledge base.



Intermediate Communication Skills and Critical Thinking

Time: 75 Minutes

Maximum: 30 Marks

(The figures in the right hand margin indicate marks.)

PART – A

(2 x 5 = 10 Marks)

Q.1. Answer ALL questions

- | | | | |
|----|--|---|----|
| a. | Lucubrate Comprehensive Listening . | 1 | k5 |
| b. | Give two examples of Appreciative Listening. | 2 | k1 |
| c. | Discuss any two causes of Stage Fear. | 3 | K3 |
| d. | What is Open-mindedness in Listening? | 2 | K5 |
| e. | Discuss the following terms of Public Speaking:
i) Preparation ii) Performance | 3 | K3 |

PART – B

(10 x 2 = 20 Marks)

Answer ALL Questions

- | | | | | |
|------|--|---|---|----|
| 2.a. | Explicit the types of Listening. | 5 | 2 | K5 |
| b. | Comprehensive Listening helps in resolving Conflicts. Justify. | 5 | 1 | K2 |

(OR)

- | | | | | |
|------|--|---|---|----|
| c. | Explain the role of feedback in Comprehensive Listening. | 5 | 2 | K5 |
| d. | What is Public speaking? Discuss its importance. | 5 | 3 | K3 |
| 3.a. | Write difference between Active listening and Passive listening. | 5 | 2 | K5 |
| b. | Public speaking facilitates Critical Thinking and Career Advancement. Elaborate. | 5 | 3 | K3 |

(OR)

- | | | | | |
|----|---|---|---|----|
| b. | Explain the importance of personal development and its connection with public speaking. | 5 | 3 | K4 |
| c. | Briefly lucubrate the symptoms and techniques to overcome Stage Fear. | 5 | 3 | K3 |



B. Tech (Third Semester)
CYCLE TEST - I

23BCSES2303/23BCMES23001/23BCDES23001: DIGITAL ELECTRONICS

Time: 75 Minutes

Maximum: 30 Marks

(The figures in the right hand margin indicate marks.)

PART - A

Q.1. Answer ALL questions

(2 x 5 = 10 Marks)

- | | CO # | Blooms Level |
|---|------|--------------|
| a. Define pulse width and duty cycle for a pulse waveform. | CO1 | L1 |
| b. Convert the decimal number 268.75 into binary, octal and hexadecimal | CO1 | L2 |
| c. Define self-complementing code with one example. | CO2 | L1 |
| d. State De-Morgan's Theorems. Draw the equivalent logic diagrams. | CO3 | L1 |
| e. Prove that dual of EX-OR is EX-NOR. | CO3 | L2 |

PART - B

(10 x 2 = 20 Marks)

Answer ALL Questions

Marks	CO#	Blooms Level
-------	-----	--------------

- | | | | |
|--|---|-----|----|
| 2.a. Do the following operations using 1's complement method, where A=25 and B=14.
(i) A-B (ii) B-A. | 5 | CO2 | L2 |
| b. Mention the IEEE 754 format for the single precision method and find out the floating-point number from the following representation.
0 10000011 00111000000000000000000000000000
(OR) | 5 | CO2 | L3 |
| c. Do the following operations using 2's complement method, where A=46 and B=16.
(i) A-B (ii) B-A. | 5 | CO2 | L2 |
| d. Mention the IEEE 754 format for the double precision method and Express -3.75 as a floating-point number using IEEE single precision. | 5 | CO2 | L2 |
| 3.a. State consensus Theorem and show that:
$AB+AB'C+BC'=AC+BC'$ | 5 | CO3 | L2 |
| b. Express the Boolean function $F = A + B'C$ as a sum of minterms and also find out the all possible Maxterms. | 5 | CO3 | L2 |
| (OR) | | | |
| b. Reduce the expression: $A+B[AC+(B+C')D]$ and with the reduced form draw the equivalent diagram. | 5 | CO3 | L3 |
| c. Express the Boolean function $F = xy + x'z$ as a product of maxterms and also find out the all possible minterms. | 5 | CO3 | L2 |



OOPS Using JAVA

Time: 75 Minutes

[23BCSPC23002/23BCMPC23002/23BCDPC23002]

Maximum: 30 Marks
(The figures in the right hand margin indicate marks.)

(2 x 5 = 10 Marks)

PART - A

Q.1. Answer ALL questions

- | | | | |
|----|---|------|--------------|
| a. | What do you mean by this keyword in Java. Write down its usage. | CO # | Blooms Level |
| b. | List out the usage of "static" keyword in java. | CO1 | K2 |
| c. | What do you mean by constructor. Describe different types of constructor. | CO1 | K1 |
| d. | Why java is known as platform independent language. Explain. | CO2 | K1 |
| e. | What do you mean by scope of a variable. Describe different types of scope. | CO2 | K2 |

PART - B

(10 x 2 = 20 Marks)

Answer ALL Questions

- | | | | | |
|------|---|-------|-----|--------------|
| 2.a. | What do you mean by jagged array. Explain with an example. | Marks | CO# | Blooms Level |
| b. | Write a program to initialize an integer array and find the maximum and minimum value of the array. | 5 | CO1 | K1 |
| c. | Explain all the features of Java. | 5 | CO1 | K1 |
| d. | Write a program to accept a number and check and display whether it is a spy number or not. (A number is spy if the sum of its digits equal the product of its digits.) | 5 | CO1 | K2 |

(OR)

- | | | | | |
|----|---|-------|-----|--------------|
| c. | Explain all the features of Java. | Marks | CO# | Blooms Level |
| d. | Write a program to accept a number and check and display whether it is a spy number or not. (A number is spy if the sum of its digits equal the product of its digits.) | 5 | CO1 | K1 |

Example : Consider the number 1124,

Sum of the digits = $1 + 1 + 2 + 4 = 8$

Product of the digits = $1 \times 1 \times 2 \times 4 = 8$.

- | | | | | |
|------|---|---|-----|----|
| 3.a. | Write a java program to find the area of a circle, rectangle and square using method overloading. | 5 | CO2 | K2 |
| b. | Write down the differences between constructor and method. | 5 | CO2 | K1 |

(OR)

- c. Create a class Box that uses a parameterized constructor to initialize the dimensions of a box. The dimensions of the Box are width, height, depth. The class should have a method that can return the volume of the box. Create an object of the Box class and test the functionalities. 5 CO2 K2
- d. Write down difference between instance variable and class variable. 5 CO2 K1



Gandhi Institute of Engineering & Technology University,

Gunupur - 765022

B. Tech (Third Semester)

CYCLE TEST - I

DATABASE MANAGEMENT SYSTEMS

[23BCSPC23001/23BCMPC23001/23BCDPC23001]

Time: 75 Minutes

Maximum: 30 Marks

(The figures in the right-hand margin indicate marks.)

PART - A

(2 x 5 = 10 Marks)

Q.1. Answer ALL questions

- Write down the syntax of create command and create a basic students table including roll no, name, gender, dob, fees as attribute
- Define single and multi-valued attributes
- Define weak and strong entity sets?
- What is a unary relationship give two examples
- What do you mean by total participation?

	CO #	Blooms Level	
a.	1	1	2
b.	2	2	K2
c.	2	1	(s)
d.	2	2	
e.	2	1	Blooms Level

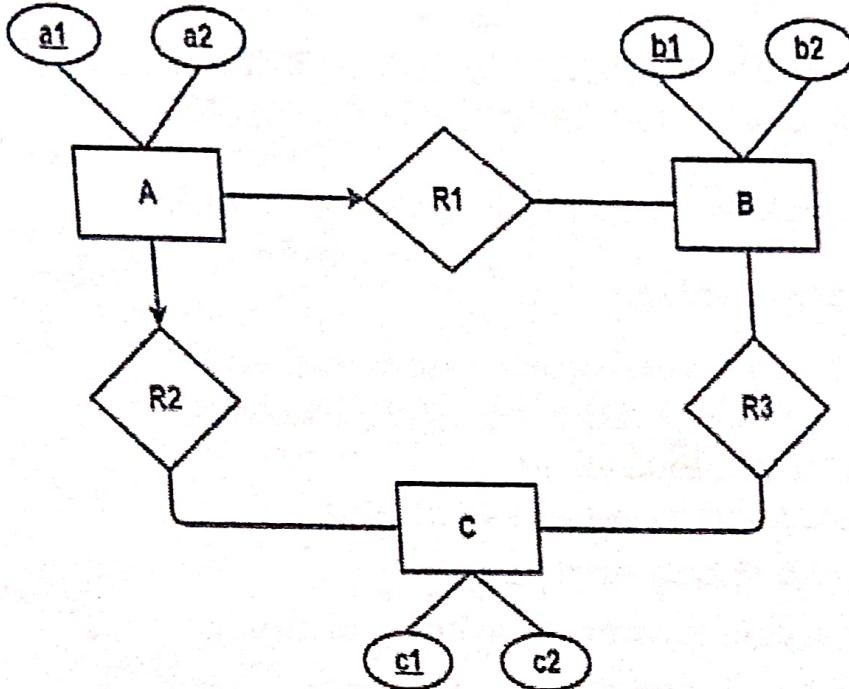
PART - B

(10 x 2 = 20 Marks)

Answer ALL Questions

- | | Marks | CO# | Blooms Level | |
|--|-------|-----|--------------|------|
| 2.a | 5 | 1 | 1 | K2 |
| b. | 5 | 2 | 1 | |
| (OR) | | | | |
| c. | 5 | 1 | 2 | |
| d. | 5 | 2 | 2 | K2 |
| 3.a | 5 | 2 | 1 | |
| b. | 5 | 2 | 2 | |
| (OR) | | | | |
| c. | 5 | 2 | 1 | 1 K3 |
| required to represent the given ER diagram
in relational model. | | | | |

P.T.O



d. Write down short notes (any two)

- (i) Data independence
- (ii) 3-tier architecture
- (iii) end users

5 2 2



Time: 75 Minutes

Maximum: 30 Marks

(The figures in the right hand margin indicate marks.)

PART - A

(2 x 5 = 10 Marks)

Q.1. Answer ALL questions

- a. Write all methods of primary data 1 K1
- b. Write the empirical relation between mean, median and mode 1 K1
- c. Find D_6 and P_{72} for the following observations: 12, 9, 4, 17, 25, 29, 15, 10 and 21. 1 K2
- d. Find the weighted Harmonic Mean of the first 'n' natural number whose weights are equal to the corresponding number. 2 K2
- e. Find the mean of cube of first 10 even natural numbers. 2 K2

PART - B

(10 x 2 = 20 Marks)

Answer ALL Questions

Marks	CO#	Blooms Level
-------	-----	--------------

- 2.a. Out of a total number of 1, 807 women who were interviewed for employment in a textile factory of Mumbai; 512 were from textile areas and the rest from the non-textile areas. Amongst the married women who belonged to textile areas, 247 were experienced and 73 inexperienced, while for non-textile areas, the corresponding figures were 49 and 520. The total number of inexperienced women was 1,341 of whom 111 resided in textile areas. Of the total number of women, 918 were unmarried and of these the number of experienced women in the textile and non-textile areas was 154 and 16 respectively. Tabulate. 5 2 K2
- b. Draw the stem and leaf diagram of given observations: 4.7, -30, 2.38, 13.7, 9.38, -1.324, -7.523, 18.198, 17.527, 32.55, 21, 17, 14, 28.382, 17.98 5 2 K2
(OR)
- c. Draw the histogram for the following frequency distributions: 5 1 K3

Variable	10	20	40	60	90	120
Frequency	12	30	70	130	120	75

P.T.O

- d. Draw the box plot of the following data: 43, 76, 87, 32, 5, 1, K3
30, 65, 43, and 27.

- 3.a. Arithmetic Mean height of 50 students of a college is 5'8" inches. The height of 30 of these is given in frequency distribution below. Arithmetic Mean height of 20 students is to be found.

No. of students	4	12	4	8	2
Height (inch)	5'4"	5'6"	5'8"	5'10"	6'0"

5 2 K3

- b. In the frequency distribution of 100 families, given below are the number of families corresponding to expenditure group are missing from the table. Median is known to be 50. Find the missing frequency.

Expenditure	00 — 20	20 — 40	40 — 60	60 — 80	80 – 100
No. of families	14	?	27	?	15

(OR)

- c. Find mean using Step – Deviation method.

Class	10 – 19	20 – 29	30 – 39	40 – 49	50 – 59
Frequency	8	8	15	11	8

5 2 K3

- d. For given frequency distribution, calculate G.M and H.M.

Marks	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50
# Students	5	7	15	25	8

5 1 K4

GANDHI INSTITUTE OF ENGINEERING & TECHNOLOGY UNIVERSITY,**GUNUPUR - 765022****B. Tech (Third Semester)****CYCLE TEST - II****Intermediate Communication Skills and Critical Thinking****(23BCDPC23001/23BCMPC23002/23BCSPC23002)**

Time: 75 Minutes

Maximum: 30 Marks

(The figures in the right hand margin indicate marks.)

PART - A**(2 x 5 = 10 Marks)****Q.1. Answer ALL questions**

- | | CO # | Blooms Level |
|---|------|--------------|
| a. Outline the concept of Proofreading. | 4 | K2 |
| b. Lucubrate Reading comprehension. | 5 | K2 |
| c. Briefly discuss the following terms: | 5 | K1 |
| i) Skimming
ii) Scanning | | |
| d. Enumerate the six critical thinking questions essential for problem-solving. | 6 | K2 |
| e. What is Lateral Thinking? | 6 | K2 |

PART - B**(10 x 2 = 20 Marks)****Answer ALL Questions**

- | | Marks | CO# | Blooms Level |
|---|-------|-----|--------------|
| 2.a. Why is writing essential for building a career? | 5 | 4 | K2 |
| b. What are the stages involved in the writing process? | 5 | 4 | K2 |
| (OR) | | | |
| c. How does free writing differ from drafting? | 5 | 4 | K2 |
| d. Suggest some strategies to improve Reading Skills? | 5 | 5 | K3 |
| 3.a. What are the different types of Reading? | 5 | 5 | K2 |
| b. What are the core skills involved in critical thinking? | 5 | 6 | K1 |
| (OR) | | | |
| c. Why is Critical Thinking important for students' development? | 5 | 6 | K2 |
| d. What is Lateral Thinking, and how does it differ from Critical Thinking? | 5 | 6 | K2 |

GUNUPUR - 765022

B. Tech (Third Semester)
CYCLE TEST - II**Artificial Intelligence Expert System(23BCMPE23011)**

Time: 75 Minutes

Maximum: 30 Marks

(The figures in the right hand margin indicate marks.)

(2 x 5 = 10 Marks)

PART - A**Q.1. Answer ALL questions**

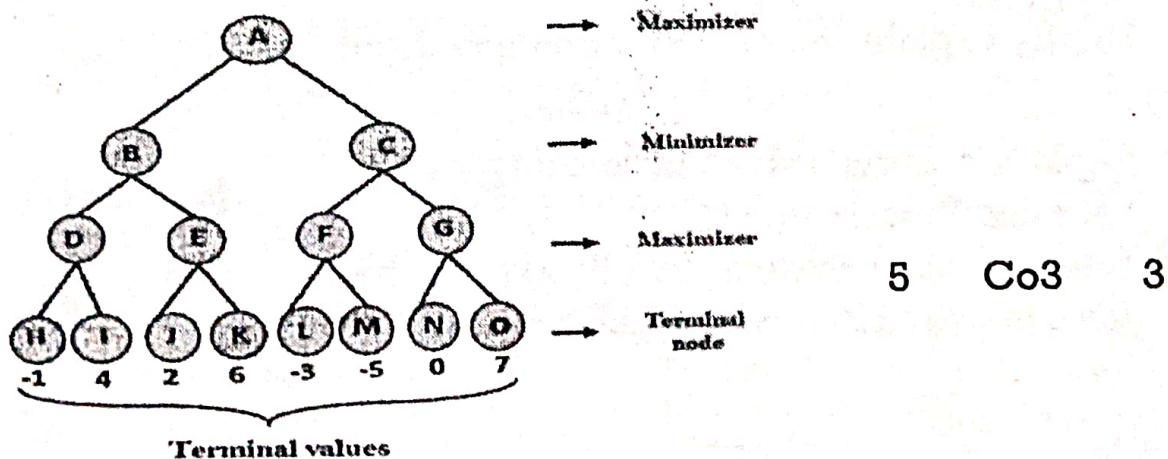
- | | | |
|--|------|--------------|
| a. Define Game Tree in AI. | CO # | Blooms Level |
| b. Explain Utility Score in Game Playing. | Co3 | 1 |
| c. Differentiate between Machine Learning & Natural Language Processing. | Co3 | 2 |
| d. Explain Learning by Induction. | Co4 | 2 |
| e. Write down the characteristics of Expert System. | Co4 | 1 |
| | Co5 | 2 |

PART - B

(10 x 2 = 20 Marks)

Answer ALL Questions

2.a.



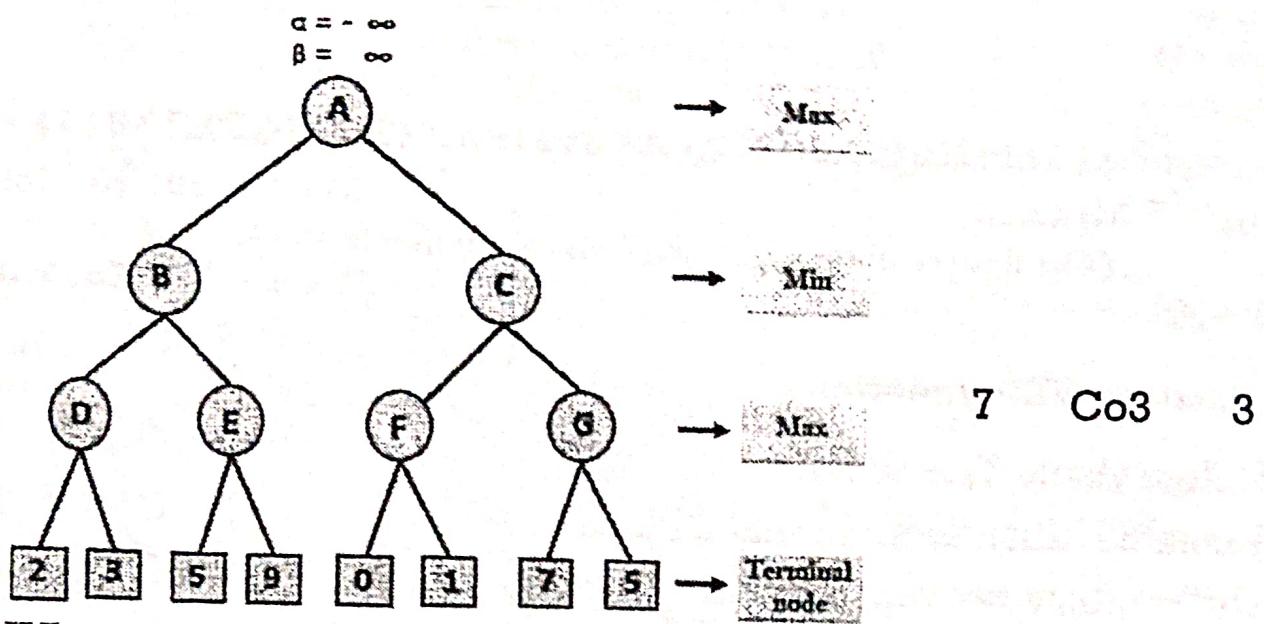
Solve above problem using Min-Max Algorithm and Evaluate the Utility Score.

- b. Define Role of Planning in AI, Explain about types of Planning in AI with Example.

5 Co3 2

(OR)**P.T.O**

C.



Why Alpha-Beta Pruning is better than Mini-Max search procedure? Solve the above problem using alpha beta pruning.

- d. Differentiate between Forward and Backward Planning in AI? 3 Co3 2
- 3.a. What is Natural language processing? Briefly explain the steps involved in it with suitable example? 5 Co4 2
- b. Briefly explain Neural Net learning in detail. 5 Co4 2
(OR)
- c. Explain in Details about different types of Learning Process in AI? 5 Co4 2
- d. What is Expert System? Briefly explain the steps involved in it with suitable example? 5 Co5 2



GANDHI INSTITUTE OF ENGINEERING & TECHNOLOGY UNIVERSITY,

GUNUPUR - 765022

B. Tech (Third Semester)
CYCLE TEST - II

Applied Statistics (23BCDBS23001)

Time: 75 Minutes

Maximum: 30 Marks

(The figures in the right hand margin indicate marks.)

(2 x 5 = 10 Marks)

PART - A

Q.1. Answer ALL questions

- | | CO # | Blooms Level |
|--|------|--------------|
| a. What is a sampling distribution? | 2 | K2 |
| b. Define point estimator, what are the criteria for a good estimator? | 1 | K1 |
| c. What is alternative hypothesis? | 2 | K2 |
| d. Define covariance. | 1 | K1 |
| e. What is skew-ness? | 3 | K2 |

PART - B

(10 x 2 = 20 Marks)

Answer ALL Questions

- | | Marks | CO# | Blooms Level |
|--|-------|-----|--------------|
| 2.a. A random sample of 700 units from a large consignment and in that 200 were damaged. Find 95% confidence limit for the proportion of damage units in the consignment | 5 | CO4 | K2 |
| b. Let $X_1, X_2, X_3, \dots, X_n$ be a random sample from uniform distribution with population density function $f(X, \theta) = \frac{1}{2\theta}, -\theta < X < \theta$. Obtain the estimator of θ by the method of moments. | 5 | C03 | K3 |

(OR)

- | | | | |
|---|---|-----|----|
| c. Let $X_1, X_2, X_3, \dots, X_n$ be a random sample from Normal distribution $N(\mu, \sigma^2)$ population. Prove that $t = \frac{\sum_{i=1}^n X_i}{n}$ is a good estimator of μ . | 5 | C03 | K3 |
| d. A company has head office at Kolkata and a branch at Mumbai. The personal director want to know if the workers at the two places would like the introduction of a new plan work and a survey has conducted for this purpose. Out of sample of 500 workers at Kolkata 62% favor the new plan. At Mumbai out of 400 workers 41% were against the new plan. Is there any significance difference b/w the two groups in their attitude towards the new plan at 5% level? | 5 | C03 | K2 |

P.T.O

- 3.a. A radio shop sells, on average 200 radios per day with a standard deviation of 50 radios. After an extensive advertising campaign, the management will compute the average sales for the next 25 days to see whether an improvement has occurred. Assume that the daily sales of radio are normally distributed. Test the hypothesis at a 5 % level of significance if the sample average is 216. 5 C04 K2
- b. A weighing machine without any display was used by an average of 320 persons a day with a standard deviation of 50 persons. When an attractive display was used on the machine, the average for 100 days increased by 15 persons. Can we say that the display did not help much? Use a level of significance of 0.05. 5 C04 K2
- (OR)**
- c. Let x_1, x_2, \dots, x_n be a random sample from the normal distribution $N(\mu, \sigma^2)$ population. Find the MLE of σ^2 . 5 C03 K3
- d. A research worker wishes to estimate the mean of the population by using a sufficiently large sample. The probability is 0.95 that the sample mean will not differ from the true mean by more than 25% of the standard deviation. How large a sample should be taken? 5 C04 K2



DIGITAL ELECTRONICS

(23BCSES23003/23BCMES23001/23BCDES23001)

Time: 75 Minutes

Maximum: 30 Marks

(The figures in the right hand margin indicate marks.)

PART – A

(2 x 5 = 10 Marks)

Q.1. Answer ALL questions

- | | CO # | Blooms
Level |
|---|------|-----------------|
| a. What is prime implicant? Explain when it is said to be essential? | 4 | 1 |
| b. Analyse how can a decoder be used as demultiplexer? | 4 | 3 |
| c. State the difference between combinational circuit and sequential circuit. | 4 | 1 |
| d. Draw PIPO register. | 6 | 2 |
| e. Find the characteristic equation of a JK Flip-Flop. | 5 | 1 |

PART – B

(10 x 2 = 20 Marks)

Answer ALL Questions

- | | Marks | CO# | Blooms
Level |
|---|-------|-----|-----------------|
| 2.a. Define a Full adder. Sketch its truth table and construct it using two half adder circuits and an ‘OR’ gate. | 5 | 4 | 3 |
| b. Find the minimized Boolean function using a four variable K-map: | | | |
| F (A, B, C, D) = $\Sigma m (0, 1, 3, 4, 5, 7, 9, 11, 15)$
and then, sketch the simplified functions using logic gates. | 5 | 4 | 3 |

(OR)

- | | | | |
|--|---|---|---|
| c. State race around condition in JK flipflop and how it could be avoided? | 5 | 5 | 1 |
| d. An 8-bit shift register has the binary equivalent of the decimal number 86 stored in it. For each case, assume the same initial state | | | |

given. Find out the contents of the register after the following operations:

5 6 1

- a. Shift Right 1 b. Rotate Right 2
- c. Rotate Left 2

3.a. The four variable logic function can be expressed as:

$$F(A, B, C, D) = \Sigma m(1, 2, 5, 7, 9, 11, 14).$$

5 4 3

Construct the above function using a 8×1 MUX.

b. Write short notes on **any one** of the following:

- a. 2-bit comparator
- b. 2-bit by 2-bit binary multiplier
(OR)

5 4 1

c. Write short notes on **any one** of the following:

- a. SIPO Shift register
- b. SR Flipflop

5 6 1

d. Convert SR Flipflop to JK Flipflop and draw its equivalent circuit.

5 5 2

**GANDHI INSTITUTE OF ENGINEERING & TECHNOLOGY UNIVERSITY,
GUNUPUR - 765022**



B. Tech (Third Semester)
CYCLE TEST - II
OOPS Using Java

(23BCDPC23001/23BCMPC23002/23BCSPC23002)

Time: 75 Minutes

Maximum: 30 Marks

(The figures in the right hand margin indicate marks.)

PART - A

(2 x 5 = 10 Marks)

Q.1. Answer ALL questions

- | | CO # | Blooms Level |
|--|------|--------------|
| a. What do you mean by checked and unchecked exception.
Give example of each. | 2 | K1 |
| b. What is Autoboxing and unboxing in java. | 2 | K1 |
| c. Write any two uses of super keyword in java. | 2 | K2 |
| d. What do you mean by deadlock. | 3 | K2 |
| e. What do you mean by marker interface. Give example. | 3 | K2 |

PART - B

(10 x 2 = 20 Marks)

Answer ALL Questions

- | | Marks | CO# | Blooms Level |
|---|-------|-----|--------------|
| 2.a. What do you mean by inheritance. What are the different types of inheritance. Describe any 2 types of inheritance with suitable example. | 5 | 2 | K1 |
| b. Create a class named 'Animal' which includes methods like eat() and sleep(). Create a child class of Animal named 'Bird' and override the parent class methods. Add a new method named fly(). Create an instance of Animal class and invoke the eat and sleep methods using this object. Create an instance of Bird class and invoke the eat, sleep and fly methods using this object. | 5 | 2 | K2 |

(OR)

- | | | | |
|--|---|---|----|
| c. Write down the differences between method overloading and method overriding. | 5 | 2 | K1 |
| d. Write a java program that will return the first half of the string, if the length of the string is even. It should return null for odd length string. | 5 | 2 | K2 |

P.T.O

- 3.a. Explain with the help of an example program, how inter-thread communication is performed in Java using wait() and notify() method. 5 3 K1
- b. Write a java Program to create a Thread and print the first 10 natural numbers along the Thread name with a delay of 2 seconds ? 5 3 K2

(OR)

- b. What is multithreading? Explain the steps for creating thread in Java. Also explain the predefined thread priorities in Java. 5 3 K1
- c. Write a program to create two threads, one thread will print odd numbers and second thread will print even numbers from 1 to 20. 5 3 K2