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KONGU ENGINEERING COLLEGE, PERUNDURAI 638 060

EVEN SEMESTER 2022-2023

CONTINUOUS ASSESSMENT TEST I- March 2023

(Regulations 2020)

Programme : B.E/B.Tech Branch : CSE & IT Semester : IV	Date : 07.03.2023 Time : 9.15 am-10.45 am
Course Code : 20MAT42 Course Name : Probability and Statistics	Duration : 1.30 Hours Max. Marks : 50

PART - A (10 × 2 = 20 Marks)

ANSWER ALL THE QUESTIONS

1.	A random variable X has the density function given by $f(x) = \begin{cases} 2x, & 0 \leq x \leq 1 \\ 0, & \text{otherwise} \end{cases}$. Find $P\left(X < \frac{1}{2}\right)$.	[CO1, K2]														
2.	The monthly demand for Allwyn watches is known to have the following probability distribution: <table border="1" style="margin-left: auto; margin-right: auto;"><tr><td>Demand</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td>Probability</td><td>0.08</td><td>0.12</td><td>0.19</td><td>0.24</td><td>0.16</td><td>0.10</td></tr></table> Find the expected demand for watches.	Demand	1	2	3	4	5	6	Probability	0.08	0.12	0.19	0.24	0.16	0.10	[CO1, K2]
Demand	1	2	3	4	5	6										
Probability	0.08	0.12	0.19	0.24	0.16	0.10										
3.	If $E(X) = 5$, $\text{Var}(X) = 4$, find $E(4X+8)$ and $\text{Var}(4X+5)$.	[CO1, K2]														
4.	If the distribution function of a random variable X is $F(x) = \frac{x^2}{3}$, $x > 0$, find the probability density function of X.	[CO1, K2]														
5.	Write any two properties of Moment Generating function.	[CO1, K1]														
6.	Define n^{th} moment about origin.	[CO1, K1]														
7.	If the p.d.f of the random variable X is given by $f(x) = \frac{x}{2}$ in $1 \leq x \leq 5$, find the p.d.f of $Y=2X-3$.	[CO1, K2]														
8.	The Mean and Variance of a binomial distribution are 5 and 4, determine the value of 'n'.	[CO2, K1]														
9.	If X is a Poisson Variate such that $P(X = 2) = \frac{2}{3} P(X = 1)$. Find the parameter λ .	[CO2, K2]														
10.	A car hire firm has two cars which it hires out day by day. The number of demands for a car on each day is distributed as Poisson variate with mean 1.5. Calculate the proportion of days on which there was no demand.	[CO2, K3]														

Part - B (3 × 10 = 30 Marks)

ANSWER ANY THREE QUESTIONS

11.	A random variable 'X' has the following probability function <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>x</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr> <tr><td>$p(x)$</td><td>a</td><td>3a</td><td>5a</td><td>7a</td><td>9a</td><td>11a</td><td>13a</td><td>15a</td><td>17a</td></tr> </table> (i) Determine the value of 'a' (ii) Find $P(X < 3)$, $P(X \geq 3)$, $P(0 < X < 5)$ (iii) Find the cumulative distribution function of X .	x	0	1	2	3	4	5	6	7	8	$p(x)$	a	3a	5a	7a	9a	11a	13a	15a	17a	(10)	[CO1, K3]
x	0	1	2	3	4	5	6	7	8														
$p(x)$	a	3a	5a	7a	9a	11a	13a	15a	17a														
12.	A Continuous random variable X has the p.d.f, $f(x) = K(4x - 2x^2)$, $0 \leq x \leq 2$. Find the value of K , Mean and Variance.	(10)	[CO1, K3]																				
13.	A random variable X has density function given by $f(x) = \begin{cases} \frac{1}{3} e^{-\frac{x}{3}}, & x \geq 0 \\ 0, & x < 0 \end{cases}$. Obtain the moment generating function and the first four moments about the origin.	(10)	[CO1, K3]																				
14.	In a large consignment of electric bulbs 10 percent are defective. A random sample of 20 is taken for inspection. Find the probability that (i) all are good bulbs (ii) atmost there are 3 defective bulbs and (iii) exactly there are 3 defective bulbs.	(10)	[CO2, K3]																				

Bloom's Taxonomy Level	Remembering (K1)	Understanding (K2)	Applying (K3)	Analysing (K4)	Evaluating (K5)	Creating (K6)
Percentage	10	20	70	-	-	-

KONGU ENGINEERING COLLEGE, PERUNDURAI 638 060

EVEN SEMESTER 2022-23

CONTINUOUS ASSESSMENT TEST II- APRIL 2023

(Regulations 2020)

Programme : B.E/B.TECH	Date : 20.04.2023
Branch : CSE & IT	Time : 9.15 am-10.45 am
Semester : IV	
Course Code : 20MAT42 Course Name : Probability and Statistics	Duration : 1.30 Hours Max. Marks : 50

PART - A (10 × 2 = 20 Marks)

ANSWER ALL THE QUESTIONS

(Use of Statistical Table is Permitted)

1. Let one copy of a magazine out of 10 copies bear a special prize following geometric distribution. Determine its mean and variance. [CO2, K3]
2. A random variable X has a uniform distribution over $(-3,3)$. Compute $P(|X| < 2)$. [CO2, K2]
3. State any two properties of normal distribution. [CO2, K1]
4. If the joint probability function of (X, Y) is given by $P(x, y) = K(2x + 3y)$, $x = 0, 1, 2$ and $y = 1, 2, 3$, find K . [CO3, K2]
5. The joint probability distribution of (X, Y) is given by
- | | | |
|-----------------|-------|-------|
| $Y \setminus X$ | 0 | 1 |
| 0 | $2/9$ | $1/9$ |
| 1 | $1/9$ | $5/9$ |
- Find the Marginal distribution of X and Y . [CO3, K2]
6. If the joint PDF of X and Y is given by $f(x, y) = \begin{cases} c(2x + y), & 0 \leq x \leq 2; 0 \leq y \leq 3 \\ 0, & \text{otherwise} \end{cases}$. Find c . [CO3, K2]
7. Define Covariance. [CO3, K1]
8. Write the equations of the two regression lines. [CO3, K1]
9. The two regression lines are $4x - 5y + 33 = 0$ and $20x - 9y = 107$. Find the mean of X and Y . [CO3, K2]
10. State the formula for the transformation of a two dimensional random variables. [CO3, K1]

Part - B (3 × 10 = 30 Marks)

ANSWER ANY THREE QUESTIONS

11. The mileage which the car owners get with certain kind of radial tyre is a RV having an exponential distribution with mean $4000\ km$. Find the probabilities that one of these tyres will last (i) at least $2000\ km$ (ii) at most $3000\ km$. (10) [CO2, K3]
12. In a test on 2000 electric bulbs, it was found that the life of a particular make, was normally distributed with an average life of $2040\ hrs$ and S.D of $60\ hrs$. Estimate the number of bulbs likely to burn for (a) more than $2150\ hrs$ (b) less than $1950\ hrs$ and (c) between $1920\ hrs$ and $2160\ hrs$. (10) [CO2, K3]
13. If X and Y have joint PDF given by $f(x, y) = x + y$, $0 < x < 1$; $0 < y < 1$.
(i) Find the Marginal density function X and Y . (ii) Find the conditional distribution of Y given X . (iii) Check whether X and Y are independent. (10) [CO3,K3]
14. Calculate the correlation coefficient for the following data.
- | | | | | | | |
|-----|----|----|----|----|----|----|
| X | 10 | 14 | 18 | 22 | 26 | 30 |
| Y | 18 | 12 | 24 | 6 | 30 | 36 |
- (10) [CO3,K3]

Taxonomy Level	(K1)	(K2)	(K3)	(K4)	(K5)	(K6)
Percentage	13%	17%	70%	-	-	-

Roll No. **2 I T R O S &**

KONGU ENGINEERING COLLEGE, PERUNDURAI 638 060

EVEN SEMESTER 2022-23

CONTINUOUS ASSESSMENT TEST III – MAY 2023

(Regulations 2020)

Programme : B.E/B.Tech	Date : 30.05.23
Branch : CSE & IT	Time : 9.15 am – 10.45 am
Semester : IV	
Course Code : 20MAT42 Course Name : Probability and Statistics	Duration : 1 ½ Hours Max. Marks : 50

PART - A (10× 2 = 20 Marks)

ANSWER ALL THE QUESTIONS

- State Type I and Type II error in sampling theory. [CO4,K1]
- A sample of 900 members has a mean of 3.4 cm and standard deviation 2.61 cm. Is the sample from a large population of mean 3.25 cm and standard deviation is 2.61 cm. Test the significance at 5% level. [CO4,K2]
- In a sample of 1000 people in Maharashtra, 540 are rice eaters and the rest are wheat eaters. Can we assume that both rice and wheat are equally popular in this state at 1% level of significance. [CO4,K2]
- State the applications of χ^2 test. [CO4,K1]
- Two random sample gave the following results. [CO4,K2]

Sample	Size	sample mean	Standard deviation
I	9	14.33	3.33
II	7	15.71	4.48

Find if the variances are significantly different.

- What are the basic principles in the design of experiment? [CO5,K1]
- Define Analysis of Variance. [CO5,K1]
- State the assumptions made for the validity of F- test in ANOVA [CO5,K2]
- Discuss the advantages of Complete Randomized Design. [CO5,K2]
- Why 2X2 Latin square is not-possible? [CO5,K2]

Part – B (3× 10 = 30 Marks)
ANSWER ANY THREE QUESTIONS

- A group of 10 rats fed on diet A and another group of 8 rats fed on diet B, (10) [CO4,K3] recorded the following increase in weight (gms).

Diet A	5	6	8	1	12	4	3	9	6	10
Diet B	2	3	6	8	10	1	2	8		

Test the significance difference of Diet A and Diet B.

12. From the following information state whether the condition of the child is associated with the condition of the house using χ^2 test. (10) [CO4,K3]

Condition of the child	Condition of the house	
	clean	dirty
Clean	69	51
Fairly clean	81	20
dirty	35	44

13. An experiment was designed to study the performance of 4 different detergent for cleaning fuel injectors. The following cleanliness readings were obtained with specially designed equipment for 12 tanks of the gas distributed over 3 different models of engine: (10) [CO5,K3]

	Engine I	Engine II	Engine III
Detergent A	45	43	51
Detergent B	47	46	52
Detergent C	48	50	55
Detergent D	42	37	49

Perform the ANOVA and test at % level of significance whether there are differences in the detergents or in the engines.

14. The following is a Latin square of a design when 4 varieties of seeds are being tested. Set up the analysis of variance table and state your conclusion. (10) [CO5,K3]

A(105)	B(95)	C(125)	D(115)
C(115)	D(125)	A(105)	B(105)
D(115)	C(95)	B(105)	A(115)
B(95)	A(135)	D(95)	C(115)

Bloom's Taxonomy Level	Remembering (K1)	Understanding (K2)	Applying (K3)	Analysing (K4)	Evaluating (K5)	Creating (K6)
Percentage	13	20	67	-	-	-

KONGU ENGINEERING COLLEGE, PERUNDURAI 638 060
EVEN SEMESTER 2022-2023
CONTINUOUS ASSESSMENT TEST 1 - MARCH 2023
(Regulations 2020)

Programme : B.E./B.Tech., Branch: IT Semester: IV	Date : 07.03.2023 Time : 02:30 PM to 04:00 PM
Course Code : 20ITT41 Course Name: Principle of Communication	Duration: 1 ½ Hours Max. Marks: 50

PART - A (10 × 2 = 20 Marks)**ANSWER ALL THE QUESTIONS**

1. Indicate the need for modulation in communication systems. [CO1,K1]
2. Draw the pattern of AM envelope of modulated output. [CO1,K1]
3. Determine bandwidth of AM waveform if carrier frequency is 5kHz and frequency of modulating frequency is 500Hz. [CO1,K3]
4. For an AM envelope with $V_{max} = 30 \text{ V}_p$ and $V_{min} = 10 \text{ V}_p$, determine percentage modulation. [CO1,K3]
5. Classify the types of amplitude modulator circuits. [CO1,K3]
6. Mention the function of super heterodyne receivers in communication systems. [CO1,K1]
7. Compare frequency modulation and phase modulation. [CO2,K2]
8. Define direct FM and indirect FM in modulation circuits. [CO2,K1]
9. Express the equation for frequency modulated signals. [CO2,K3]
10. Determine peak frequency deviation (Δf) for an FM modulator with a deviation sensitivity $K_1 = 5 \text{ kHz/V}$ and modulating signal $v_m(t) = 2 \cos(2\pi 2000t)$ [CO2,K2]

Part – B (3 × 10 = 30 Marks)**ANSWER ANY THREE QUESTIONS**

11. With principle of amplitude modulation and necessary diagram, derive the expression for the AM wave and draw its spectrum. (10) [CO1,K1]
12. A modulating signal of $2 \cos 5000t$ is amplitude modulated over a carrier signal of $5 \cos 20000t$. Determine expression and values for modulation index, LSB and USB frequencies, bandwidth and the ratio of sideband power in the total power of AM wave. (10) [CO1,K3]
13. Discuss the operation and components of low level AM circuit with relevant circuit diagrams (10) [CO1,K2]
14. Calculate frequency of carrier signal, baseband modulating frequency, modulation index and peak phase deviation for the given phase modulated signal : (10) [CO2,K3]
 $e(t) = 40 \sin (6.28 \times 10^6 t + 20 \sin 6.283 \times 10^3 t)$

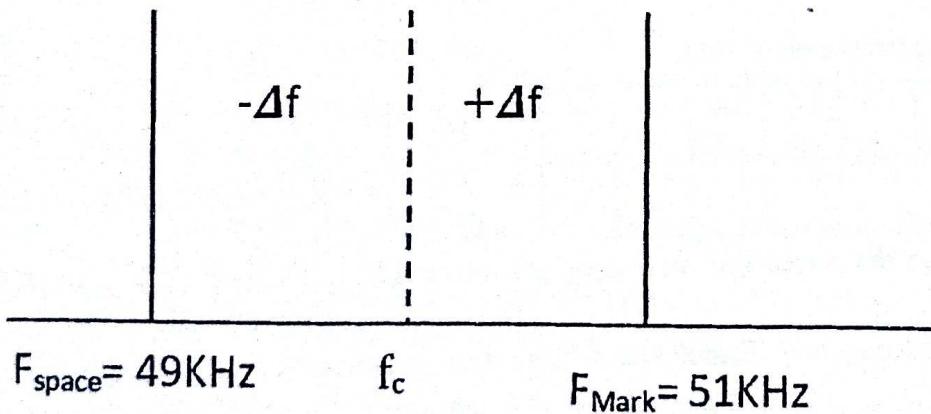
Bloom's Taxonomy Level	Remembering (K1)	Understanding (K2)	Applying (K3)	Analysing (K4)	Evaluating (K5)	Creating (K6)
Percentage	30	23.33	46.67			

KONGU ENGINEERING COLLEGE, PERUNDURAI 638 060
 EVEN SEMESTER 2022-2023
 CONTINUOUS ASSESSMENT TEST 2 - APRIL 2023
 (Regulations 2020)

Programme : B.Tech., Branch: IT Semester: IV	Date : 20.04.2023 Time : 02:30 PM to 04:00 PM
Course Code & Name: 20ITT41 – Principle of Communication	Duration: 1 $\frac{1}{2}$ Hours Max. Marks : 50

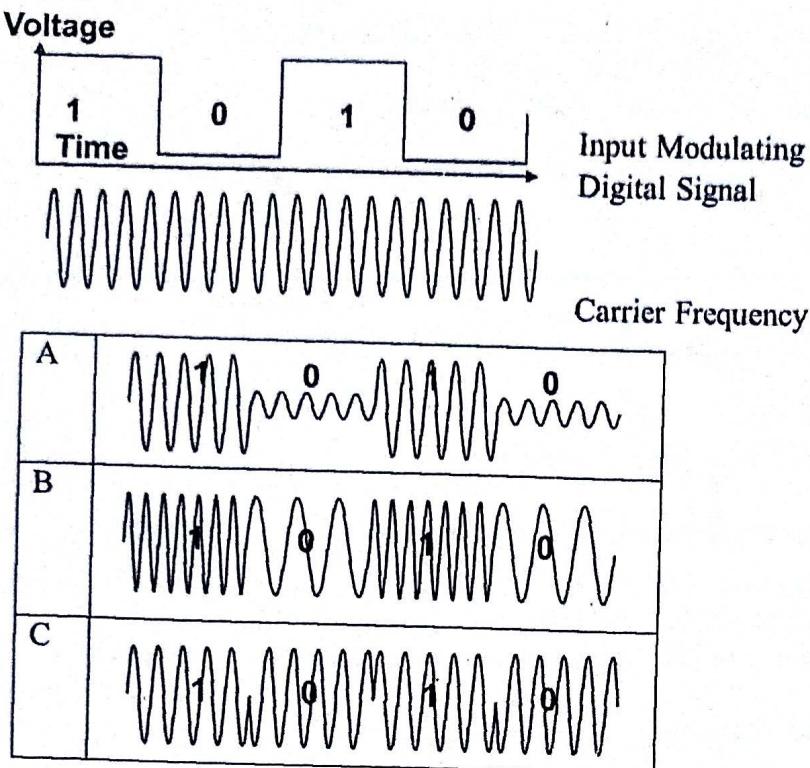
PART - A (10 × 2 = 20 Marks)
ANSWER ALL THE QUESTIONS

1. Specify the advantage of angle modulation over amplitude modulation. [CO2,K2]
2. When the modulating frequency in an FM system is 400Hz and the modulating voltage is 2.4V, the modulation index is 60. Calculate the maximum deviation. What is the modulation index when the modulating frequency is reduced to 250 Hz and modulating voltage simultaneously raised to 3.2V? [CO2,K3]
3. Draw the functional block diagram of phase locked loop. [CO2,K2]
4. Show the frequency spectrum structure of angle modulation [CO2,K1]
5. Determine the deviation ratio (DR) and worst case bandwidth (BW) for FM signal with maximum frequency deviation is 25 KHz and the maximum modulation signal frequency is 12.5KHz. [CO2,K3]
6. Express the mathematical representation of amplitude shift keying and frequency shift keying modulated waves. [CO3,K1]
7. Say any two characteristics of pulse code modulation and mention its applications. [CO3,K2]
8. What is the necessity of digital signal transmission over analog signal transmission? [CO3,K1]
9. Infer from the following figure for Frequency domain spectrum of frequency shift keying with input bit rate of 2 kbps. [CO3,K3]



Determine (a) the peak frequency deviation, (b) minimum bandwidth

10. Identify the following shift keying signal A, B and C for the given input modulating signal and carrier signal. [CO3,K1]



Part - B ($3 \times 10 = 30$ Marks)

ANSWER ANY THREE QUESTIONS

1. For an FM modulator has a carrier signal $V_c(t) = 10\sin(2\pi 50000t)$ and a deviation (10) [CO2,K3] sensitivity $k_1=10\text{KHz}/$ and has the modulating signal $V_m(t) = 4 \sin(2\pi 10000t)$. Use the given below the data table and Determine the following

- the frequency deviation
- Modulation index
- Deviation ratio
- Bandwidth by Bessel rule
- Bandwidth by Carson rule
- Carrier power with loading resistance of 10Ω

Modulation Index	0.25	0.5	1	1.5	2	2.4	2.5	3	4	5	6	7
Number of set sidebands	1	2	3	4	4	5	6	6	7	8	9	10

With neat circuit diagram explain the direct FM modulator and direct PM modulator (10) [CO2,K1] using Varactor diode.

State the definition of sampling theorem and aliasing effect. Also demonstrate with neat (10) [CO3,K2] pictorial explanation.

Describe the digital T Carrier system with relevant functional block diagrams.

(10) [CO3,K2]

Bloom's Taxonomy Level	Remembering (K1)	Understanding (K2)	Applying (K3)	Analysing (K4)	Evaluating (K5)	Creating (K6)
Percentage	30	43.33	26.67			

KONGU ENGINEERING COLLEGE, PERUNDURAI 638 060
 EVEN SEMESTER 2022-2023
 CONTINUOUS ASSESSMENT TEST 3 - MAY 2023
 (Regulations 2020)

Programme : B.Tech., Branch : IT Semester: IV	Date : 30.05.2023 Time : 02:30 PM to 04:00 PM
Course Code & Name: 20ITT41 – Principle of Communication	Duration: 1 ½ Hours Max. Marks : 50

PART - A (10 × 2 = 20 Marks)

ANSWER ALL THE QUESTIONS

- | | | |
|-----|---|----------|
| 1. | Bring out a suitable block diagram for anyone PSK type o transmitter. | [CO3,K3] |
| 2. | For 8-PSK system operating with an information bit rate of 24 Kbps. Determine its bandwidth efficiency. | [CO3,K3] |
| 3. | Identify the various error detection methods available in communication systems. | [CO4,K2] |
| 4. | Determine the odd and even parity bits for the ASCII character 'S' | [CO4,K3] |
| 5. | Differentiate between the electrical characteristics of RS232 and RS485. | [CO4,K2] |
| 6. | List the objectives of ISDN based data communication. | [CO4,K2] |
| 7. | Indicate the significance of PN sequence. | [CO5,K1] |
| 8. | Mention the types of frequency hop spread spectrum technique. | [CO5,K1] |
| 9. | A spread spectrum communication system has the following parameters; information bit duration $T_b = 4.095$ ms, PN chip duration $T_c = 1 \mu s$. Determine processing gain. | [CO5,K2] |
| 10. | What is meant by slow frequency hopping and fast-frequency hopping. | [CO5,K1] |

Part – B (3 × 10 = 30 Marks)

ANSWER ANY THREE QUESTIONS

- | | | | |
|-----|--|------|----------|
| 11. | An 8-PSK system is specified with the given system parameters as:
Carrier power, $C = 10^{-8}$ W, Noise power, $N = 2.5 \times 10^{-10}$ W
A bit rate of input signal, $f_b = 240$ kbps to be sent through a channel of bandwidth 80 kHz. Determine
(i) Noise power density
(ii) Energy per bit
(iii) Energy-per-bit to noise-power-density ratio in dB
(iv) Carrier to noise-power ratio in dB. | (10) | [CO3,K3] |
| 12. | Illustrate the significance of BAR codes with its classification and explain the concept behind UPC type BAR code. | (10) | [CO4,K2] |
| 13. | a) Determine the BCS for the following data- and CRC-generating polynomials:
$G(x) = x^7+x^4+x^2+x^0 = 1\ 0\ 0\ 1\ 0\ 1\ 0\ 1$
$P(x) = x^5+x^4+x^1+x^0 = 1\ 1\ 0\ 0\ 1\ 1$

b) Determine the Hamming bits for the ASCII character "B." Insert the hamming bits into every other bit location starting from the left. | (6) | [CO4,K3] |
| 14. | Describe the principle of direct sequence spread spectrum technique with suitable block diagram and waveform. | (4) | [CO5,K2] |

Bloom's Taxonomy Level	Remembering (K1)	Understanding (K2)	Applying (K3)	Analysing (K4)	Evaluating (K5)	Creating (K6)
Percentage	10%	46.67%	43.33%	--	--	--

Programme	: B.Tech	Date	: 08.03.2023
Branch	: IT	Time	: 09.15 am to 10.45 am
Semester	: IV		
Code	: 20ITT42	Duration	: 1 ½ hrs
Subject	: Database Management Systems	Maximum Marks	: 50

PART - A (10 × 2 = 20 Marks)**ANSWER ALL THE QUESTIONS**

- Define DBMS [CO1,K1]
- Differentiate between file processing system and DBMS. [CO1,K2]
- Differentiate Physical data independence and logical data independence. [CO1,K2]
- Determine atleast five super keys, possible candidate keys and suitable primary key for the following relation. Faculty(fid, fname, designation, address, salary, phoneno, mailid) [CO1,K3]
- Consider the following relations A, B, C. How many tuples does the result of the following relational algebra expression contain? Assume that the schema of A ∪ B is the same as that of A. 0 [CO1,K3]

$$(A \cup B) \triangleright \triangleleft_{A.Id > 40 \vee C.Id < 15} C$$

Table A

Id	Name	Age
12	Arun	60
15	Shreya	24
99	Rohit	11

Table B

Id	Name	Age
15	Shreya	24
25	Hari	40
98	Rohit	20
99	Rohit	11

Table C

Id	Phone	Area
10	2200	02
99	2100	01

- Determine the SQL statement for the following relational algebra expression 0

[CO1,K3]

$$\pi_{S10} (\sigma_{rating > 10} (supplier))$$

- Convert into relational algebra for the following SQL query ()

Select distinct a₁, a₂, ..., a_n From r₁, r₂, ..., r_m Where P;

[CO2,K3]

- Consider the relations r₁(P, Q, R) and r₂(R, S, T) with primary keys P and R respectively. The relation r₁ contains 3000 tuples and r₂ contains 2500 tuples. Find the maximum size of the join r₁ \bowtie r₂. ()

[CO2,K3]

- Consider the following relational schema: ()

COURSES (cno, cname)

STUDENTS (rollno, sname, age, year)

REGISTERED FOR (cno, rollno)

The underlined attributes indicate the primary keys for the relations. The 'year' attribute for the STUDENTS relation indicates the year in which the student is currently studying (First year, Second year etc.)

Write a SQL query to print the age and year of the youngest student in each year.

[CO2,K3]

10. A table T1 in a relational database has the following rows and columns: 0

[CO2,K3]

Rollno	marks
1	10
2	20
3	30
4	Null

The following sequence of SQL statements was successfully executed on table T1.
Update T1 set marks = marks + 5

Select avg(marks) from T1

What is the output of the select statement?

PART – B (3 × 10 = 30 Marks)
ANSWER ANY THREE QUESTIONS

11. Illustrate the system architecture of DBMS with a neat diagram.
12. a. Draw the schema diagram for hospital management system.
b. How database applications are handled in two and three tier architecture? (5) (5)

[CO1,K2]

[CO1,K2]

13. Consider the following relational database
emp (empname, street, city)
works(empname, comppname, salary)
company(comppname, city)
manager (empname, managername)

[CO1,K3]

Give an expression in the relational algebra to express each of the following queries:

- a. Find the names of all employees who work for First Bank Corporation.
- b. Find the names and cities of residence of all employees who work for First Bank Corporation.
- c. Find the names, street address, and cities of residence of all employees who work for First Bank Corporation and earn more than \$10,000.
- d. Find the names of all employees in this database who live in the same city as the company for which they work.
- e. Find the names of all employees who live in the same city and on the same street as do their managers.

14. Consider the following relational database
emp (empname, street, city)
works(empname, comppname, salary)
company(comppname, city)
manager (empname, managername)

[CO2,K3]

Give an expression in SQL for each of the following queries

- i) Modify the database so that Ram now lives in Delhi.
- ii) Find the names and cities of residence of all employees who work for First Bank Corporation.
- iii) Find all employees in the database who earn more than every employee of small bank corporation.
- iv) Find all employees who earn more than the average salary of all employees of their company.
- v) Remove the company relation from the database.

Bloom's Taxonomy Level	Remembering (K1)	Understanding (K2)	Applying (K3)	Analysing (K4)	Evaluating (K5)	Creating (K6)
Percentage	3%	40%	57%	-	-	-

KONGU ENGINEERING COLLEGE, PERUNDURAI, ERODE- 638 060
 EVEN SEMESTER 2022 - 23
 CONTINUOUS ASSESSMENT TEST II – April 2022
 Regulation 2020

Roll. No. 21ITR082

Programme : B.Tech	Date : 21.04.2023
Branch : IT	Time : 09.15 AM to 10.45 AM
Semester : IV	
Code : 20ITT42	Duration : 1 ½ hrs
Subject : Database Management Systems	Maximum Marks : 50

PART - A (10 × 2 = 20 Marks)

ANSWER ALL THE QUESTIONS

- Differentiate between Strong entity and Weak entity sets. [CO2,K2]
- List the different types of attributes. [CO2,K1]
- Check the functional dependencies of a relation are satisfied or not? Consider a relation R (A, B, C, D) with the following instance. [CO3,K3]

A	B	C	D
1	1	2	3
1	2	2	3
1	3	2	3
2	4	5	6
5	6	7	8

Which of the following functional dependencies are satisfied or not satisfied by this relation?

- (a) $BD \rightarrow AC$ (b) $A \rightarrow CD$ (c) $AD \rightarrow BC$ (d) $D \rightarrow B$

- Identify the different types of anomaly that can arise in the given table with sample records. Consider the relation Treatment with the schema *Treatment (doctorID, doctorName, docaddress, patientID, diagnosis)* and functional dependencies; FDs: $\{(doctorID \rightarrow doctorName), ((doctorID, patientID) \rightarrow diagnosis)\}$. [CO3,K3]

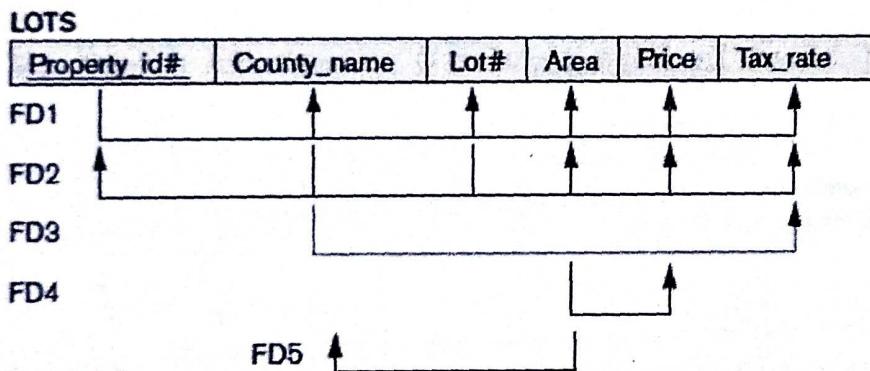
doctorID	doctorName	docaddress	patientID	diagnosis
D001	Mohan	Salem	PAT123	Fever
D002	Vijay	Erode	PAT110	Alergy
D003	Jenifer	Chennai	PAT112	Eye
D002	Vijay	Erode	PAT121	Cold
D001	Mohan	Salem	PAT145	Pain

- Find the canonical cover for the following relation schema R and set of Functional Dependencies $R(A,B,C,D,E)$, $F = \{AC \rightarrow E, C \rightarrow D, D \rightarrow A\}$. [CO3,K3]
- Define normalization. [CO3,K2]
- Suppose that we decompose the schema $R = (A, B, C, D, E)$ into (A, B, C) and (A, D, E) . Show that this decomposition is a lossless-join decomposition if the following set F of functional dependencies holds: $\{A \rightarrow BC, CD \rightarrow E, B \rightarrow D, E \rightarrow A\}$. [CO3,K3]
- Make a statement about how to change from non-3NF to 3NF. [CO3,K1]

9. Relation R has eight attributes ABCDEFGH. Fields of R contain only atomic values. $F = \{CH \rightarrow G, [CO3,K3]$
 $A \rightarrow BC, B \rightarrow CFH, E \rightarrow A, F \rightarrow EG\}$ is a set of functional dependencies (FDs) so that F^+ is exactly the set of FDs that hold for R. How many candidate keys does the relation R have?
10. Let $R = ABCDE$ is a relational scheme with functional dependency set $F = \{A \rightarrow B, B \rightarrow C, AC \rightarrow D\}$. Find the attribute closures of A and E.

PART - B (3 × 10 = 30 Marks)
ANSWER ANY THREE QUESTIONS

11. i). Construct an E-R diagram for a hospital with a set of patients and a set of medical doctors. Associate [CO2,K3] with each patient a log of the various tests and examinations conducted. (5 Marks)
ii). Construct appropriate tables for the above ER Diagram. (5 Marks)
12. i). Summarize the different RAID techniques used in the database. (5 Marks) [CO3,K2]
ii). Explain the different types of file organization. (5 Marks)
13. i). Find all keys for R. [CO3,K3]
Consider a relation R with attributes ABCDEFGH and functional dependencies S as follows:
 $S = \{A \rightarrow CD, ACF \rightarrow G, AD \rightarrow BEF, BCG \rightarrow D, CF \rightarrow AH, CH \rightarrow G, D \rightarrow B, H \rightarrow DEG\}$ (5 Marks)
ii). Decompose the table upto BCNF . (5 Marks)



14. Apply 4NF for the given Student database. Also explain about multi-valued dependencies, 5NF and 6NF with relevant examples. (10 Marks) [CO3,K3]

StudentID	Areas of Interest	Hobbies
100	OS, DBMS	Singing, Painting
101	JAVA	Reading

Bloom's Taxonomy Level	Remembering (K1)	Understanding (K2)	Applying (K3)	Analysing (K4)	Evaluating (K5)	Creating (K6)
Percentage	7%	23%	70%	-	-	-

KONGU ENGINEERING COLLEGE, PERUNDURAI 638 060
CONTINUOUS ASSESSMENT TEST - III
Regulations 2020

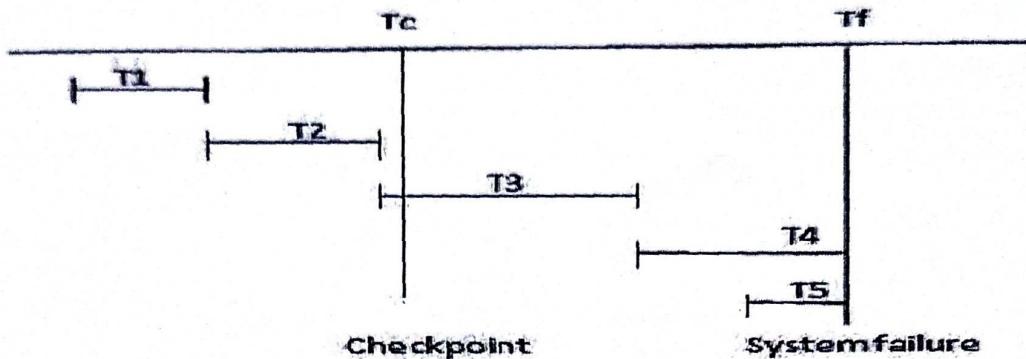
Month and Year :June 2023	Roll Number : 21ITR082
Programme :B.Tech Branch :IT Semester : IV	Date : 31.05.2023 Time : 09.15 am – 10.45 am
Course Code :20ITT42 Course Name :Database Management Systems	Duration : 1 ½ Hours Max. Marks: 50

PART – A (10×2 = 20 Marks)

ANSWER ALL THE QUESTIONS

1.	Differentiate between dense and sparse index.	[CO4,K2]																								
2.	Test the following Schedule for view serializability R1(A), R2(B), W3(A), W1(A), W2(B), R1(C)	[CO4,K3]																								
3.	Draw the necessary diagram to define the steps in query processing.	[CO4,K2]																								
4.	List the transaction states.	[CO4,K1]																								
5.	Construct Bitmaps for gender and income_level for the following Instructor relation. <table border="1" style="display: inline-table; vertical-align: middle;"> <thead> <tr> <th>record number</th> <th>ID</th> <th>gender</th> <th>income_level</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>76766</td> <td>m</td> <td>L1</td> </tr> <tr> <td>1</td> <td>22222</td> <td>f</td> <td>L2</td> </tr> <tr> <td>2</td> <td>12121</td> <td>f</td> <td>L1</td> </tr> <tr> <td>3</td> <td>15151</td> <td>m</td> <td>L4</td> </tr> <tr> <td>4</td> <td>58583</td> <td>f</td> <td>L3</td> </tr> </tbody> </table>	record number	ID	gender	income_level	0	76766	m	L1	1	22222	f	L2	2	12121	f	L1	3	15151	m	L4	4	58583	f	L3	[CO4,K3]
record number	ID	gender	income_level																							
0	76766	m	L1																							
1	22222	f	L2																							
2	12121	f	L1																							
3	15151	m	L4																							
4	58583	f	L3																							
6.	Assume that Ti requests a lock held by Tj. The following table summarizes the actions taken for wait-die and wound-wait scheme: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">Wait – die scheme</th> <th style="text-align: center;">Wound – wait scheme</th> </tr> </thead> <tbody> <tr> <td>Ti is younger than Tj</td> <td style="text-align: center;">W</td> <td style="text-align: center;">X</td> </tr> <tr> <td>Ti is older than Tj</td> <td style="text-align: center;">Y</td> <td style="text-align: center;">Z</td> </tr> </tbody> </table> Fill correct status of Ti and Tj at W, Y, X, and Z respectively.		Wait – die scheme	Wound – wait scheme	Ti is younger than Tj	W	X	Ti is older than Tj	Y	Z	[CO5,K3]															
	Wait – die scheme	Wound – wait scheme																								
Ti is younger than Tj	W	X																								
Ti is older than Tj	Y	Z																								
7.	Consider following schedule S with operations R1(A), W2(B), W1(A), R3(C), W2(C) locking protocol is used to ensure concurrency. Show wait-for graph for schedule S.	[CO5,K3]																								
8.	Apply Timestamp-Ordering Protocol for the given problem and identify the transactions to be aborted. Also, apply Thomas rule to identify the ignore writes. Assume that initially: $R-TS(A) = W-TS(A) = 0$ $R-TS(B) = W-TS(B) = 0$ $R-TS(C) = W-TS(C) = 0$ Assume $TS(T_1) = 1$, $TS(T_2) = 2$ and $TS(T_3) = 3$ <table border="1" style="display: inline-table; vertical-align: middle;"> <thead> <tr> <th>T1</th> <th>T2</th> <th>T3</th> </tr> </thead> <tbody> <tr> <td>R(A)</td> <td></td> <td></td> </tr> <tr> <td>W(A)</td> <td></td> <td></td> </tr> <tr> <td></td> <td>W(A)</td> <td></td> </tr> <tr> <td></td> <td></td> <td>R(C)</td> </tr> <tr> <td>R(C)</td> <td></td> <td></td> </tr> <tr> <td></td> <td>W(B)</td> <td></td> </tr> <tr> <td></td> <td></td> <td>W(C)</td> </tr> </tbody> </table>	T1	T2	T3	R(A)			W(A)				W(A)				R(C)	R(C)				W(B)				W(C)	[CO5,K3]
T1	T2	T3																								
R(A)																										
W(A)																										
	W(A)																									
		R(C)																								
R(C)																										
	W(B)																									
		W(C)																								

9.	Construct log record for the following Transaction T ₁ .	[CO5,K3]														
	<table border="1"> <thead> <tr> <th>Instruction</th> <th>Writes</th> </tr> </thead> <tbody> <tr> <td>R(A)</td> <td>A=100</td> </tr> <tr> <td>A=A-10</td> <td></td> </tr> <tr> <td>W(A)</td> <td>A=90</td> </tr> <tr> <td>R(B)</td> <td>B=50</td> </tr> <tr> <td>B=B+10</td> <td></td> </tr> <tr> <td>W(B)</td> <td>B=60</td> </tr> </tbody> </table>	Instruction	Writes	R(A)	A=100	A=A-10		W(A)	A=90	R(B)	B=50	B=B+10		W(B)	B=60	
Instruction	Writes															
R(A)	A=100															
A=A-10																
W(A)	A=90															
R(B)	B=50															
B=B+10																
W(B)	B=60															
10.	Consider the following transaction schedules having checkpoints. Identify the transactions for redone and Undone .	[CO5,K3]														



PART – B (3 × 10 = 30 Marks)
ANSWER ANY THREE QUESTIONS

11.	Construct a B+-tree for the following set of key values :(2, 3, 5, 7, 11, 17, 19, 23, 29 and 31). Assume that the tree is initially empty and values are added in ascending order. Construct B+-trees for the cases where the number of pointers that will fit in one node is Four. Also, show the form of the tree after each of the following series of operations: a. Insert 9. b. Insert 10. c. Insert 8. d. Delete 23. e. Delete 19.	(10)	[CO4,K3]
12.	Suppose that we are using extendable hashing on a file that contains records with the following search-key values: 2, 3, 5, 7, 11, 17, 19, 23, 29 and 31. Show the extendable hash structure for this file if the hash function is $h(x) = x \bmod 8$ and buckets can hold three records. Also, Show how the extendable hash structure changes as the result of each of the following steps: a. Delete 11. b. Delete 31. c. Insert 1. d. Insert 15.	(10)	[CO4,K3]
13.	Elucidate the functionalities of Lock based protocol with your own examples.	(10)	[CO5,K2]
14.	Illustrate the recovery algorithm with your own example.	(10)	[CO5,K2]

Bloom's Taxonomy Level	Remembering (K1)	Understanding (K2)	Applying (K3)	Analysing (K4)	Evaluating (K5)	Creating (K6)
Percentage	3	40	57	--	--	--

KONGU ENGINEERING COLLEGE, PERUNDURAI 638 060
 CONTINUOUS ASSESSMENT TEST 1
 (Regulations 2020)

Month and Year :March 2023	Roll Number: 21ITR082
Programme : B.Tech Branch : IT Semester : IV	Date : 08.03.2023 Time : 02.30 pm to 04.00 pm
Course Code : 20ITT43 Course Name : Design and Analysis of Algorithms	Duration : 1 ½ Hours Max. Marks : 50

PART - A (10 × 2 = 20 Marks)
ANSWER ALL THE QUESTIONS

1. What is an algorithm design techniques? [CO1] [K1]
 2. Find gcd(31415, 14142) by applying Euclid's algorithm [CO1] [K3]
 3. Solve the following recurrence relation [CO1] [K3]
 $x(n) = x(n/5) + n$ for $n > 1$, $x(1) = 1$ (solve for $n = 5^k$)
 4. How much the function value (nlog₂n) will change if its argument is increased three fold? [CO1] [K3]
 5. Find the $\Theta(g(n))$ of the following equation and prove your assertion $3^{n+1} + 3^{n-1}$ [CO1] [K3]
 6. Give the definition for O-notation [CO1] [K1]
 7. Find the average-case efficiency for the given algorithm [CO1] [K3]
- ALGORITHM SequentialSearch($A[0..n - 1]$, K)**
- //Searches for a given value in a given array by sequential search
- //Input: An array $A[0..n - 1]$ and a search key K
- //Output: The index of the first element in A that matches K
- // or -1 if there are no matching elements
- ```

i ← 0
while i < n and $A[i] \neq K$ do
 i ← i + 1
 if i < n return i
 else return -1

```
8. Compute the value [CO1] [K3]
$$\sum_{i=2}^{n-1} i(i-1)$$
  9. Sort the following numbers using bubble sort. 99, 48, 78, 93, 29, 36, 14 [CO2] [K3]
  10. Define brute force approach. [CO2] [K1]

**Part – B (3 × 10 = 30 Marks)**  
**ANSWER ANY THREE QUESTIONS**

11. Write the recursive algorithm and derive the time efficiency of finding the  $n!$  (10) [CO1] [K2]
12. Design a recursive algorithm for computing  $2^n$  for any nonnegative integer  $n$  that (10) [CO1] [K4] is based on the formula:  $2^n = 2^{n-1} + 2^{n-1}$ 
  - Set up a recurrence relation for the number of additions made by the algorithm and solve it.
  - Draw a tree of recursive calls for this algorithm and count the number of calls made by the algorithm

13. Describe the generalized framework for analyzing the efficiency of algorithms (10) [CO1] [K2]
14. Write the Brute force string matching algorithm and find out the time efficiency (10) [CO2] [K3] of the algorithm. Trace the algorithm and determine the number of character comparisons made by the brute-force algorithm in searching for the pattern EEBE in the text : EEBBEFEEDEEBEEBE

| Bloom's Taxonomy Level | Remembering (K1) | Understanding (K2) | Applying (K3) | Analysing (K4) | Evaluating (K5) | Creating (K6) |
|------------------------|------------------|--------------------|---------------|----------------|-----------------|---------------|
| Percentage             | 10               | 33.33              | 40            | 16.67          |                 |               |

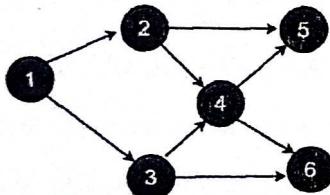
## CONTINUOUS ASSESSMENT TEST 2

(Regulations 2020)

|                                                 |                             |
|-------------------------------------------------|-----------------------------|
| Month and Year : April 2023                     | Roll Number: 21ITR082       |
| Programme : B.Tech                              | Date : 21.04.2023           |
| Branch : IT                                     | Time : 02.30 PM to 04.00 PM |
| Semester : IV                                   |                             |
| Course Code : 20ITT42                           | Duration : 1 ½ Hours        |
| Course Name : Design and Analysis of Algorithms | Max. Marks : 50             |

**PART - A (10 × 2 = 20 Marks)**  
**ANSWER ALL THE QUESTIONS**

- State closest-pair problem. [CO2] [K1]
- The post-order traversal of a binary tree is 8, 9, 6, 7, 4, 5, 2, 3, 1. The in-order traversal of the same tree is 8, 6, 9, 4, 7, 2, 5, 1, 3. Find the height of the binary tree? (GATE) [CO2] [K3]
- What is the number of swaps required to sort n elements using merge sort, in the worst case? (GATE) [CO2] [K4]
- List the three variations of transformation techniques used transform and conquer design techniques [CO3] [K1]
- Consider the problem of finding the largest elements in an array of n numbers. Compare the efficiency of brute-force algorithm and pre-sorting-based algorithm [CO3] [K4]
- Sort the vertices using topological sort [CO3] [K2]



- How many rotations are required to insert a sequence of elements 19, 16, 15, 18, 17, 20 in an empty AVL tree? (GATE) [CO3] [K4]
- Partition the array of elements {2, 5, 1, 7, 9, 12, 11, 10} using Hoare partition algorithm. [CO3] [K2] (GATE)
- Compare decrease by a constant and decrease by a constant factor. [CO3] [K2]
- Specify the properties of a heap. [CO3] [K1]

**Part - B (3 × 10 = 30 Marks)**  
**ANSWER ANY THREE QUESTIONS**

- (i) Write a pseudo code of insertion sort and find its worst case time complexity for (5) [CO3] [K3] sorting n numbers.
- (ii) Apply insertion sort to sort the list C,O,N,Q,U,E,R in alphabetical order. (5) [CO3] [K3]
- Compute  $1201 \times 2430$  by applying the divide and conquer algorithm. How many digit multiplication does the multiplication of long integers algorithm make for n-digit numbers? (10) [CO2] [K3]

13. (i) Write the quick select algorithm. To find the 4<sup>th</sup> smallest of the list of numbers (5) [CO3] [K2]  
 8,15,3,19,24,32,6
- (ii) Write an algorithm to find k<sup>th</sup> smallest element in an array[0... n-1] and derive (5) [CO3] [K2]  
 its worst case time complexity
14. (i) Construct a heap for the list {10,28,60,5,30,17,44} by the bottom-up algorithm. (5) [CO3] [K3]
- (ii) Write an algorithm to create a heap using bottom-up approach and find how (5) [CO3] [K3]  
 many key comparison is required in worst-case?

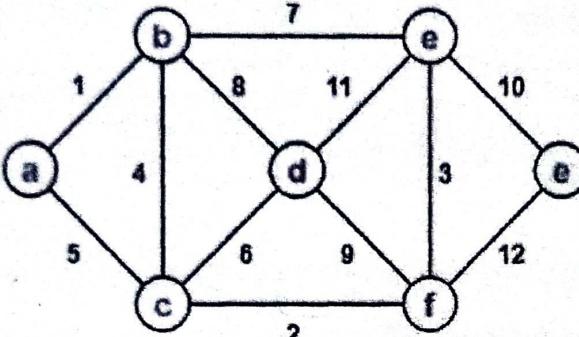
| Bloom's Taxonomy Level | Remembering (K1) | Understanding (K2) | Applying (K3) | Analysing (K4) | Evaluating (K5) | Creating (K6) |
|------------------------|------------------|--------------------|---------------|----------------|-----------------|---------------|
| Percentage             | 10               | 27                 | 53            | 10             |                 |               |

## CONTINUOUS ASSESSMENT TEST 3

(Regulations 2020)

|                                                 |                                  |
|-------------------------------------------------|----------------------------------|
| Month and Year :May 2023                        | Roll Number: 21ITR082            |
| Programme : B.Tech                              | Date : 31.05.2023                |
| Branch : IT                                     | Time : 02.30pm – 04.00pm         |
| Semester : IV                                   |                                  |
| Course Code : 20ITT43                           | Duration : 1 $\frac{1}{2}$ Hours |
| Course Name : Design and Analysis of Algorithms | Max. Marks : 50                  |

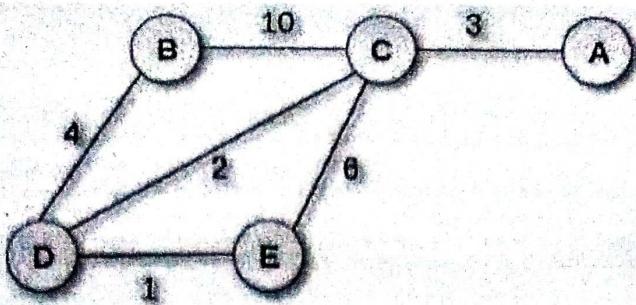
**PART - A (10 × 2 = 20 Marks)**  
**ANSWER ALL THE QUESTIONS**

|     |                                                                                                             |               |      |
|-----|-------------------------------------------------------------------------------------------------------------|---------------|------|
| 1.  | How many possible binary search trees can be built with five keys?                                          | [CO4]<br>Gate | [K2] |
| 2.  | Draw any two possible spanning tree for the given graph G.                                                  | [CO4]<br>Gate | [K2] |
|     |                           |               |      |
| 3.  | Compare Dynamic Programming with Greedy technique.                                                          | [C04]         | [K2] |
| 4.  | Write the recurrence relation for solving the knapsack problem using dynamic programming.                   | [C04]         | [K2] |
| 5.  | Write the Floyd's algorithm.                                                                                | [C04]         | [K2] |
| 6.  | In n-queen problem, mention whether solution exists for 2-queens and 3-queens problem. Justify your answer. | [C05]<br>Gate | [K2] |
| 7.  | State the difference between promising node and non-promising node in a state-space tree.                   | [C05]         | [K2] |
| 8.  | Define deterministic and non-deterministic algorithm.                                                       | [C05]         | [K1] |
| 9.  | Define class P.                                                                                             | [C05]         | [K1] |
| 10. | Mention any two NP complete problems.                                                                       | [C05]         | [K1] |

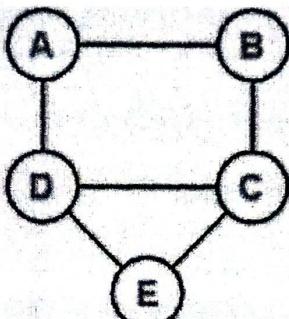
**Part – B (3 × 10 = 30 Marks)**  
**ANSWER ANY THREE QUESTIONS**

|             |                                                                                                                                                                                                                           |     |       |      |      |   |   |   |   |             |     |     |     |     |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------|------|------|---|---|---|---|-------------|-----|-----|-----|-----|
| 11.         | Construct an optimal binary search tree for the given set of four-keys                                                                                                                                                    | 10  | [CO4] | [K3] |      |   |   |   |   |             |     |     |     |     |
|             | <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>keys</td><td>A</td><td>B</td><td>C</td><td>D</td></tr> <tr> <td>probability</td><td>0.4</td><td>0.1</td><td>0.3</td><td>0.2</td></tr> </table> |     |       |      | keys | A | B | C | D | probability | 0.4 | 0.1 | 0.3 | 0.2 |
| keys        | A                                                                                                                                                                                                                         | B   | C     | D    |      |   |   |   |   |             |     |     |     |     |
| probability | 0.4                                                                                                                                                                                                                       | 0.1 | 0.3   | 0.2  |      |   |   |   |   |             |     |     |     |     |

12. Write Prim's algorithm and construct a minimum spanning tree starting with the source node A for the given undirected graph G 10 [CO4] [K3]



13. (i) Find the Hamiltonian cycle by using the backtracking approach for a given graph. 5 [CO5] [K2]

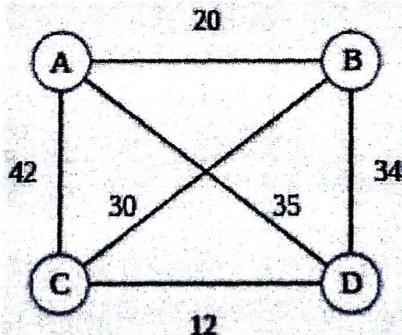


(ii) Solve the following instance of the subset sum problem using backtracking approach  
 $A = \{1, 3, 4, 5\}$  and  $d = 11$ . 5 [CO5] [K2]

14. (i) Assign a Job to a Person at minimum cost using branch and bound algorithm design techniques. 5 [CO5] [K3]

|          | Job1 | Job2 | Job3 | Job4 |
|----------|------|------|------|------|
| Person 1 | 6    | 2    | 9    | 8    |
| Person 2 | 7    | 4    | 3    | 5    |
| Person 3 | 5    | 7    | 1    | 4    |
| Person 4 | 8    | 5    | 6    | 4    |

(ii) Apply the branch-and-bound algorithm to solve the traveling salesman problem for the following graph: 5 [CO5] [K3]



| Bloom's Taxonomy Level | Remembering (K1) | Understanding (K2) | Applying (K3) | Analysing (K4) | Evaluating (K5) | Creating (K6) |
|------------------------|------------------|--------------------|---------------|----------------|-----------------|---------------|
| Percentage             | 10               | 40                 | 50            |                |                 |               |

**KONGU ENGINEERING COLLEGE, PERUNDURAI - 638 060**  
**CONTINUOUS ASSESSMENT TEST – I**  
(Regulations 2020)

|                              |                             |
|------------------------------|-----------------------------|
| Month and Year : March 2023  | Roll Number : 21ITT082      |
| Programme : B.Tech.          | Date : 09.03.2023           |
| Branch : IT                  | Time : 09.15 am to 10.45 am |
| Semester : IV                | Duration : 1 ½ Hours        |
| Course Code : 20ITT44        | Max. Marks : 50             |
| Course Name : Web Technology |                             |

**PART - A (10 × 2 = 20 Marks)**

**ANSWER ALL THE QUESTIONS**

- |                                                                                                                                                                                                                                                                                                                                                                                          |        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| 1. List the key features of Web 2.0.                                                                                                                                                                                                                                                                                                                                                     | CO1 K1 |
| 2. How to set the width and height of an image using HTML?                                                                                                                                                                                                                                                                                                                               | CO1 K1 |
| 3. Create an HTML document containing an order list of two items about your favourite foods.                                                                                                                                                                                                                                                                                             | CO1 K3 |
| 4. Recall the purpose of responsive web design.                                                                                                                                                                                                                                                                                                                                          | CO1 K1 |
| 5. Give the basic Structure of a Bootstrap Grid.                                                                                                                                                                                                                                                                                                                                         | CO1 K1 |
| 6. List the CSS selectors.                                                                                                                                                                                                                                                                                                                                                               | CO1 K1 |
| 7. What is the output of the following script?<br><pre>&lt;!DOCTYPE html&gt; &lt;html lang="en"&gt; &lt;body&gt; &lt;script&gt; var x = 20; var y = '20'; if(x === y) {     document.getElementById('output').innerHTML = 'x and y are equal.'; } else {     document.getElementById('output').innerHTML = 'x and y are not equal.'; } &lt;/script&gt; &lt;/body&gt; &lt;/html&gt;</pre> | CO2 K2 |
| 8. Difference between var and let in JavaScript.                                                                                                                                                                                                                                                                                                                                         | CO2 K2 |
| 9. Write a JavaScript that performs the cube of a given number. Read the input from the user.                                                                                                                                                                                                                                                                                            | CO2 K3 |
| 10. Find the Page Structured Elements in HTML.                                                                                                                                                                                                                                                                                                                                           | CO1 K1 |

**Part - B (3 × 10 = 30 Marks)**

**ANSWER ANY THREE QUESTIONS**

- |                                                                                                                                                |            |
|------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| 11. i) Design a home page banking application using the following bootstrap elements<br>a. Navigation tab<br>b. Forms (Input and Input groups) | (5) CO1 K3 |
| ii) Explain the syntax of different data types in JavaScript with one example for each type.                                                   | (5) CO2 K2 |
| 12. i) Create a webpage to display the following table with design specification as shown, using HTML and CSS.                                 | (5) CO1 K3 |

|        |                 |
|--------|-----------------|
| Name:  | AAA             |
| Email: | aaa@example.com |
| Phone: | 0424<br>220000  |

- ii) Illustrate the different types of CSS with one example for each type. (5) CO1 K2
13. Design a webpage with the following student registration form (10) CO1 K3

### Registration Page

Firstname: \_\_\_\_\_

MiddleName: \_\_\_\_\_

Lastname: \_\_\_\_\_

Course:  Course  Gender:  
 Male  
 Female  
 Other Phone: +91 \_\_\_\_\_

Address: \_\_\_\_\_

Email: \_\_\_\_\_

Password: \_\_\_\_\_

Submit

14. Calculate the electricity bill with the help of the below charges using JavaScript: (10) CO2 K3  
 1 to 100 units – Rs. 10/unit  
 100 to 200 units – Rs. 15/unit  
 200 to 300 units – Rs. 20/unit  
 above 300 units – Rs. 25/unit

| Bloom's Taxonomy Level | Remembering (K1) | Understanding (K2) | Applying (K3) | Analysing (K4) | Evaluating (K5) | Creating (K6) |
|------------------------|------------------|--------------------|---------------|----------------|-----------------|---------------|
| Percentage             | 20               | 23                 | 57            | --             | --              | --            |

**KONGU ENGINEERING COLLEGE, PERUNDURAI 638 060**  
**CONTINUOUS ASSESSMENT TEST - II**  
**(Regulations 2020)**

|                              |                             |
|------------------------------|-----------------------------|
| Month and Year : April 2023  | Roll Number : 21ITR082      |
| Programme : B.Tech           | Date : 24.04.2023           |
| Branch : IT                  | Time : 09.15 AM to 10.45 AM |
| Semester : IV                |                             |
| Course Code : 20ITT44        | Duration : 1:30 Hours       |
| Course Name : Web Technology | Max. Marks : 50             |

**PART - A (10×2 = 20 Marks)**

**ANSWER ALL THE QUESTIONS**

- Give a javascript snippet to display array values of single throw of a dice randomly. [CO2,K3]
- Check whether the given roll number is valid (ex. 21ITR001) or invalid using regular expression in javascript. [CO2,K3]
- Mention the use of DOM and list out the property and methods of DOM collections. [CO2,K1]
- List out the different types of key and mouse events used in Javascript. [CO2,K1]
- Denote the features and applications of NodeJS. [CO3,K1]
- Draw the architecture and tell about the NodeJS process model. [CO3,K1]
- Is end() and end in NodeJS same or different. If different, justify your answer. [CO3,K2]
- How is code reusability enhanced in NodeJS. Give an example for displaying current date and time for the same. [CO3,K3]
- Differentiate between SQL and NoSQL databases. [CO3,K2]
- Specify the advantages and disadvantages of MongoDB. [CO3,K1]

**PART - B (3 × 10 = 30 Marks)**  
**ANSWER ANY THREE QUESTIONS**

- Design a course registration form as given below validating any four fields upon submission and clear the entries upon resetting the form. [CO2,K3]

**COURSE REGISTRATION PAGE**

Name:

what Course ur Interested :

MCA  MBA  BSC  BE-CSE  BE-AI-DS  BE-AI-ML  BE-IT  BE-EEE

Which campus Your are Interested:

Gender :

Male  Female  Other

Phone :  ||

Address

12. Write the Javascript program to implement simple BMI calculator for (10) [CO2,K3] healthcare assistant app using DOM handling functionalities.
13. a) Write the NodeJS program to create a server to handle the request from browser (6) [CO3,K2] and provide the response based on the url properties and buffer contents.  
 b) Outline the different in-built and custom event handling performed in NodeJS. (4)
14. Write mongodb queries to perform the following operations: (10) [CO3,K3]
- Insert the following information about the product like product id, productName, salestype [retail, wholesale] and price.
  - Sort the product information based on the sales type and display the details
  - Update the product price based on product id
  - Display all the product details
  - Delete product details based on product id

| Bloom's Taxonomy Level | Remembering (K1) | Understanding (K2) | Applying (K3) | Analysing (K4) | Evaluating (K5) | Creating (K6) |
|------------------------|------------------|--------------------|---------------|----------------|-----------------|---------------|
| Percentage             | 16.67            | 23.33              | 60            | --             | --              | --            |

**KONGU ENGINEERING COLLEGE, PERUNDURAI 638 060**  
**CONTINUOUS ASSESSMENT TEST - III**  
**(Regulations 2020)**

|                              |                          |
|------------------------------|--------------------------|
| Month and Year : June 2023   | Roll Number : &1ITR08&   |
| Programme : B.Tech.          | Date : 01.06.2023        |
| Branch : IT                  | Time : 09.15am – 10.45am |
| Semester : IV                |                          |
| Course Code : 20ITT44        | Duration : 1:30 Hours    |
| Course Name : Web Technology | Max. Marks : 50          |

**PART - A (10×2 = 20 Marks)**

**ANSWER ALL THE QUESTIONS**

- |                                                                                                   |          |
|---------------------------------------------------------------------------------------------------|----------|
| 1. Give the features of typescript.                                                               | [CO4,K1] |
| 2. How array differs from tuples in typescript. Give an example.                                  | [CO4,K2] |
| 3. Write the Lambda function to perform sum and average of given numbers.                         | [CO4,K3] |
| 4. How do you create group constant using enum for displaying shoe sizes in typescript?           | [CO4,K3] |
| 5. What is single page application of angular and how is it accomplished?                         | [CO4,K2] |
| 6. What do you understand by templates in angular? Give its two types with syntax.                | [CO4,K1] |
| 7. Specify the use of pipe for formatting date in angular.                                        | [CO4,K3] |
| 8. Differentiate between template driven form and reactive form in angular?                       | [CO5,K2] |
| 9. Mention the use and role of service in displaying current date and time using angular program. | [CO5,K3] |
| 10. How can asynchronous HTTP requests be handled in angular?                                     | [CO5,K2] |

**PART – B (3 × 10 = 30 Marks)**  
**ANSWER ANY THREE QUESTIONS**

- |     |                                                                                                                                                                                                                                                                                                   |     |          |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----------|
| 11. | a) Explain about three types of function using default, optional and rest parameters in typescript with an example.<br><br>b) Outline the three types of access modifiers in typescript with an example.                                                                                          | (6) | [CO4,K2] |
| 12. | a) Mention the use of static variables and methods in typescript for displaying number of years of loan duration.<br><br>b) Write the typescript program to manage the loan information like interest and rebate using class and interface illustrating single and multiple inheritance concepts. | (4) | [CO4,K3] |
| 13. | a) Recall the different types of data binding in angular for product details.<br><br>b) Illustrate about the different categories of directives used in angular with appropriate for any suitable application.                                                                                    | (4) | [CO4,K3] |
| 14. | a) Write an angular program to create reactive form with performing inbuilt and custom validations.<br><br>b) Why is routing done in angular and how is routing path set and component loaded based on the routing path?                                                                          | (6) | [CO5,K3] |

| Bloom's Taxonomy Level | Remembering (K1) | Understanding (K2) | Applying (K3) | Analysing (K4) | Evaluating (K5) | Creating (K6) |
|------------------------|------------------|--------------------|---------------|----------------|-----------------|---------------|
| Percentage             | 10.00            | 26.67              | 63.33         |                |                 |               |