Name of the Program: **BCA**                                      Semester: **II**
Stream: **CSE**
PAPER TITLE: **Introduction to Data Base Management Systems** PAPER CODE: **ECS31102**
Maximum Marks: **40**                                             Time duration: **3 Hours**
Total No of questions: **08**                                     Total No of Pages: **02**

*The figures in the margin indicate full marks.*
*Candidates are required to give their answers in their own words as far as practicable.*

**Instruction to the Candidate:**
**1.** At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam.
**2.** All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
**3.** Assumptions made if any, should be stated clearly at the beginning of your answer.

*Answer all the Groups*
**Group A**
Answer all the questions of the following                         $5 \times 1 = 5$

**1.**   **a) a)** If a relation R(A, B, C, F) has Functional dependencies as
          AB->CF,    C->ABF,    CB->AF
     Calculate the Candidate key for the relation.
     **b)** What is DDL compiler? Explain with example?
     **c)** Explain the concepts of a Super key and Candidate Key.
     **d)** Explain "Where" clause in SQL?
     **e)** What are Derived attributes? Explain with example?

**GROUP –B**
(**Short Answer Type Questions**)
Answer *any three* of the following                               $3 \times 5 = 15$

**2.**   Suppose you are given the following requirements for a simple database for the National
     Hockey League (NHL):
     - the NHL has many teams,
     - each team has a name, a city, a coach, a captain, and a set of players,
     - each player belongs to only one team,
     - each player has a name, a position (such as *left wing* or *goalie*), a skill level, and a set
     - of injury records,
     - a team captain is also a player,
     - a game is played between two teams (referred to as host_team and guest_team) and
     - has a date (such as *May 11th, 1999*) and a score (such as *4 to 2*).

     Construct a ER diagram for the NHL database using the proper symbols, indicate the cardinality
     mappings as well as any role indicators in your ER diagram.                      5

**3.**   Draw a ER Diagram with the following condition with proper cardinality and symbol. "A company
     has several departments. Each department has a supervisor and at least one employee. Employees
     must be assigned to at least one, but possibly more departments. At least one employee is assigned to

a project, but an employee may be on vacation and not assigned to any projects. The important data fields are the names of the departments, projects, supervisors and employees, as well as the supervisor and employee number and a unique project number."  5

4. Describe all Fundamental operators in Relational algebra with proper example?  5

5. Explain all type of OUTER JOINS with proper example?  5


## GROUP –C
### (Long Answer Type Questions)
Answer *any two* of the following  $2 \times 10 = 20$

6. Explain view serializability with proper example? Explain Deadlock prevention techniques?

$3+7=10$

7. a) Explain ACID Properties with proper example?  5

b) Consider the following schema:  5

Book(acc_no, yr_pub, book_title)
User(card_no, b_name, b_address)
Borrow(acc_no, doi, dor, card_ no)
where acc_ no is accession number, yr_pub is year of publication, b_name is borrower name, b_address is borrower address, doi is date of issue dor is the date of return. Perform the following queries on the table.( In Relational Algebra)
(i) Find the title of the books whose year of publication is 2018.
(ii) Display the acc_no of the book which has been borrowed by "Ramesh"
(iii) Find the borrower name who lives in same city as "Ramesh"
(iv) Find the borrower name and address who should return book on 20-06-2019
(v) Find the acc_ no of Book whose year of publication is 2017 and title is "Database Management Systems"

8. a) Explain Deferred Database Modification?  $5+5=10$
   b) What is the highest NF of each of the following relations?
   i) R1 ( W, X, Y, Z ) with FDs are W $\rightarrow$ ZY , WX $\rightarrow$ Z
   ii) R2 ( W, X, Y, Z,P) with FDs are P $\rightarrow$ WX, PY $\rightarrow$ Z

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# ADAMAS UNIVERSITY
# SCHOOL OF ENGINEERING AND TECHNOLOGY
### END-SEMESTER EXAMINATION: JULY 2020

Name of the Program: BCA                Semester: II
Stream: CSE
PAPER TITLE: Operating system          PAPER CODE: ECS31104
Maximum Marks: 40               Time duration:  3 hours
Total No of questions:               Total No of Pages: 02

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**Instruction for the Candidate:**
   1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam.
   2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
   3. Assumptions made if any, should be stated clearly at the beginning of your answer.

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*Answer all the Groups*
### Group A
Answer all the questions of the following          **5 × 1 = 5**

1.  **a)** Is dead lock Ignorance beneficial to dead lock suggest your answer?
    **b)** What is CPU utilization?
    **c)** What is need of TLB if system already have cache memory?
    **d)** What is swapper?
    **e)** What is turn around time?

### GROUP –B
#### (Short Answer Type Questions)
Answer *any three* of the following          **3 × 5 = 15**

2.  Find the average turn-around time and waiting time by using SJF technique from the below table.

| PROCESS ID | ARRIVAL TIME | BURST TIME |
|---|---|---|
| P1 | 3 | 1 |
| P2 | 1 | 4 |
| P3 | 4 | 2 |
| P4 | 0 | 6 |
| P5 | 2 | 3 |

3.  What is compaction explain it's role in Os?

4.  State difference between fixed partitioning and dynamic partitioning?
5.  Describe dead lock, and it's prevention measure taken by OS?

**(Long Answer Type Questions)**
Answer *any two* of the following                    $2 \times 10 = 20$

**6.**  Considering a system with five processes $P_0$ through $P_4$ and three resources of type A, B, C. Resource type A has 10 instances, B has 5 instances and type C has 7 instances. Suppose at time $t_0$ following snapshot of the system has been taken:

| Process | Allocation A B C | Max A B C | Available A B C |
|---------|------------------|-----------|-----------------|
| $P_0$ | 0 1 0 | 7 5 3 | 3 3 2 |
| $P_1$ | 2 0 0 | 3 2 2 | |
| $P_2$ | 3 0 2 | 9 0 2 | |
| $P_3$ | 2 1 1 | 2 2 2 | |
| $P_4$ | 0 0 2 | 4 3 3 | |

Find safe sequence?

**7.**  (i)Explain attributes of file with an example?                    5+5
(ii)If memory frame size is 3 and reference string is given as (7,2,4,1,1,1,6,6,8,9,10,6)how many hit and miss occur by FCFS technique.

**8.**  Explain synchronization technique in OS? How lock variable establish synchronization in operating system give a brief idea.

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## END-SEMESTER EXAMINATION: JULY 2020

**Name of the Program:** BCA                                    **Semester:** II
**Stream**                **:** CSE
**Paper Title**           **:** Digital Electronics            **Paper Code:** EEC31102
**Maximum Marks**         **:** 40                             **Time duration:** 3 hours
**Total No of questions:** 08                                  **Total No of Pages:** 02

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**Instruction for the Candidate:**
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2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.
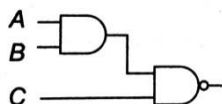
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*Answer all the Groups*
### GROUP-A
Answer *all* the questions of the following                              **5 × 1 = 5**

1.  **a)** What is meant by Duality in Boolean algebra?
    **b)** Which function is implemented by the circuit as shown in the figure?



    **c)** Express the function $Y=\overline{A}+BC$ in canonical SOP.
    **d)** Write the truth table and logic symbol for two input XNOR gate.
    **e)** Convert grey code 101011 into its binary equivalent.

### GROUP –B
(**Short Answer Type Questions**)
Answer *any three* of the following                                      **3 × 5 = 15**

2.  Realize the following Boolean expression using minimum number of NOR gates.  [5]
    $$Y=(A+\overline{B})(\overline{A}+B)$$
3.  Implement XOR gate using minimum number of NAND gates.                 [5]
4.  Implement the following expression using 8:1 MUX, $F(A,B,C) = \sum m(0,2,4,6)$  [5]
5.  Minimize the following expression using K-Map. $Y=\sum m(1,2,9,10,11,14,15)$  [5]

### GROUP –C
(**Long Answer Type Questions**)
Answer *any two* of the following                                        **2 × 10 = 20**

6.  a) What is combinational circuit?

b) Design a 16 X 1 Multiplexer using 4 X 1 Multiplexer. [2+8=10]

7. a) Implement a J-K flip flop using NAND gates only.

b) A certain counter is being pulsed by a 256 kHz clock signal. The output frequency from the last flip-flop is 2 kHz:

i) Determine the MOD number

ii) Determine the counting range.

c) Explain Ring Counter. [4+2+4=10]

8. a) Prove that $BCD+A\overline{C}\overline{D}+ABD=BCD+ A\overline{C}\overline{D}+AB\overline{C}$

b) Explain Full Substructure with proper Truth Table, Expression and Logic Circuit.

[4+6=10]

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Name of the Program: BCA          Semester: II
Stream: CSE
PAPER TITLE: Managerial Economics
PAPER CODE: HEC31180
Maximum Marks: 40                                    Time duration:  3 Hours
Total No of questions: 13                            Total No of Pages: 02

**Instruction to the Candidate:**
**1.** At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam.
**2.** All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
**3.** Assumptions made if any, should be stated clearly at the beginning of your answer.

## Section A
(Very briefly answer the following questions)                    **(5*2=10)**

   i.    Define fixed costs.

  ii.    State the law of variable proportions.

 iii.    In case of unitary price elasticity, what will be the shape of the demand curve?

 iv.    What do you mean by income effect?

  v.    Mention two determinants of demand.

## Section B

      Answer any *two* from the following:                                    **(2*5=10)**

i.    Distinguish between increase in demand and extension of demand.

ii.    Suppose the demand curve for a product is perfectly inelastic. If now there is an increase in supply, how will the equilibrium price and quantity demanded change? Explain your result with the help of a diagram.

iii.    Explain the shape of Average Fixed Cost (AFC) curve.

iv.    Diagrammatically explain the condition of profit maximization in perfect competition.

## Section C
Answer any *two* from the following:                                    **(2*10=20)**

i.    Explain the concepts of own price elasticity, income elasticity and cross price elasticity of demand.

ii. Explain and derive the equilibrium condition in a single commodity world using cardinal utility theory.

iii. Explain briefly the axioms of ordinal utility theory. Why are indifference curves (ICs) convex to the origin? (5+5)

iv. State the law of demand. Explain the exceptions to the law of demand. (2+8)

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### END-SEMESTER EXAMINATION: JULY 2020

Name of the Program: B. Tech/ BCA/MCA               Semester: II
Stream: CSE/ECE/EE/ME/CE/Biotech
PAPER TITLE: Engineering Ethics, Values and the Laws    PAPER CODE: HEN41119
Maximum Marks: 40                                  Time duration:  3 hours
Total No of questions: 08                          Total No of Pages: 02

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**Instruction for the Candidate:**
   1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam.
   2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
   3. Assumptions made if any, should be stated clearly at the beginning of your answer.

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*Answer all the Groups*
### Group A
Answer all the questions of the following              **5 × 1 = 5**

1. **a)** The punishment for subsequent conviction for knowingly infringing or abetting infringement of copyright work is …………………………
**b)** The two types of traditional forms of cyber-crimes are……………………. and ……………
**c)** "Phising" is ………………… form of cyber-crime.
**d)** An agreement enforceable by law is …………….
**e)** The punishment of intentionally selling goods or providing services to which false trademark or false trade description is applied is……………….

### GROUP –B
### (Short Answer Type Questions)
Answer *any three* of the following                    **3 × 5 = 15**

2. Write a Short Note on IEEE Code of Ethics.
3. Elaborate the directive principles of State Policy.
4. Name the agencies of cyber security.
5. Write a Short Note on "Piracy".

### GROUP –C
### (Long Answer Type Questions)
Answer *any two* of the following                     **2 × 10 = 20**

6. Decide the following cases:
   a. A's wife got abdominal pain. The doctor advised that this was to be operated for appendicitis to which 'A' and his wife reluctantly agreed. The patient was put under chloroform anesthasia. On incision, the appendix was found to be normal. The doctor then made another incision and removed the gall bladder of the patient without taking 'A's' consent, although he was waiting outside the operation theatre. The liver and kidney of the patient which were already damaged, had been further damaged due to the toxic effects of the chloroform and as a result, the patient died on the third day of the operation.
   b. The victim was resting her elbow on the window sill. A truck coming from the opposite direction hit her in her elbow and she received serious injuries.

c. Due to heavy rain a factory was flooded with water which got mixed with oily substance. The floors in the factory got slippery. The victim slipped and got injured. What is the liability of the factory?

d. A child visits zoo and put his hands inside the iron bars where a tigress was kept and his hands were crushed by the tigress.

e. A bus conductor invites passengers to travel on the roof of the bus and one of the passengers travelling on the roof is hit by the branch of a tree and falls down and gets killed after the driver swerves the bus to the right to overtake a cart.

**7.** Discuss the rights of engineers.

**8.** Describe how sustainable engineering can be beneficial to society.

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### END-SEMESTER EXAMINATION: JULY 2020

Name of the Program: **BCA**                                  Semester: **II**
Stream: **CSE**
PAPER TITLE: **Mathematics II**                     PAPER CODE: **SMA31142**
Maximum Marks: **40**                               Time duration:  **3 hours**
Total No of questions: **08**                        Total No of Pages: **02**

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**Instruction for the Candidate:**
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3. Assumptions made if any, should be stated clearly at the beginning of your answer.

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*Answer all the Groups*

## Group A
Answer **all** the questions of the following                    **5 × 1 = 5**

1.     **a)** Check whether the differential equation $(x^2 - y)dx + (y^2 - x)dy = 0$ is exact

    **b)** What is the type of the integral $\int_0^\infty \frac{dx}{(x+1)(x+2)}$ ?

    **c)** Obtain the value of $\Gamma(6)$

    **d)** What is an improper subspace of vector space $V$?

    **e)** Write the value of the Laplace transform $\mathcal{L}\{e^{2t}\cos 5t\}$

## GROUP –B

Answer ***any three*** of the following                    **3 × 5 = 15**

2.     **(a)** Prove that $\mathcal{L}\{\cosh at\} = \frac{s}{s^2-a^2}$ and $\mathcal{L}\{\cos \omega t\} = \frac{s}{s^2+\omega^2}$                    **3**

    **(b)** Find the Eigenvalues of the matrix $\begin{pmatrix} 1 & 2 \\ 2 & 1 \end{pmatrix}$                    **2**

3.     Check whether the differential equation $(x^2 - 4xy - 2y^2)dx + (y^2 - 4xy - 2x^2)dy = 0$ is exact. Then solve it.                    **5**

4.     Evaluate the improper integral $\int_0^\infty \frac{dx}{(1+x)\sqrt{x}}$ . Is the integral convergent?                    **5**

5.     **(a)** Let $\beta = (0,1,3), \gamma = (2,1,1),$ and $\delta = (4,2,2)$. Check whether $\beta$ is a linear combination of $\gamma$ and $\delta$.                    **2.5**

    **(b)** Show that 4 is an Eigenvalue of the matrix $\begin{pmatrix} 3 & 1 \\ 1 & 3 \end{pmatrix}$ and then find the corresponding Eigenvector.                    **2.5**

Answer **_any two_** of the following $\qquad$ **$2 \times 10 = 20$**

**6.** **(a)** Solve the differential equation $xdy - ydx = \sqrt{(x^2 + y^2)}dx$ $\qquad$ **5**

$\qquad$ **(b)** Evaluate the improper integral $\int_1^\infty \frac{dx}{x^3+x^2}$ . Then comment on its convergence. $\qquad$ **5**

**7.** **(a)** Using the Laplace transform method, solve the differential equation

$$y'' - y = t, \quad y(0) = 1 \text{ and } y'(0) = 1$$ **5**

$\qquad$ **(b)** Use the Cayley-Hamilton theorem to show that $\begin{pmatrix} 1 & 1 \\ 0 & 1 \end{pmatrix}^{50} = \begin{pmatrix} 1 & 50 \\ 0 & 1 \end{pmatrix}$. $\qquad$ **5**

**8.** **(a)** Write the relation between the Beta function and the Gamma Function. Then use it to obtain the value of $\int_0^1 x^{5/2}(1 - x)^{5/2}dx$ **[106/15]** $\qquad$ **5**

$\qquad$ **(b)** Write the necessary and sufficient condition for a non-empty subset $W$ of a vector space $V$ over a field $F$ to be a subspace of $V$. $\qquad$ **2**

$\qquad$ **(c)** Let $S$ be a subset of $\mathbb{R}^3$ defined by $S = \{(x, y, z) \in \mathbb{R}^3 : x^2 = y^2 + z^2$. Check whether $S$ forms a subspace of the vector space $\mathbb{R}^3$ $\qquad$ **3**

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