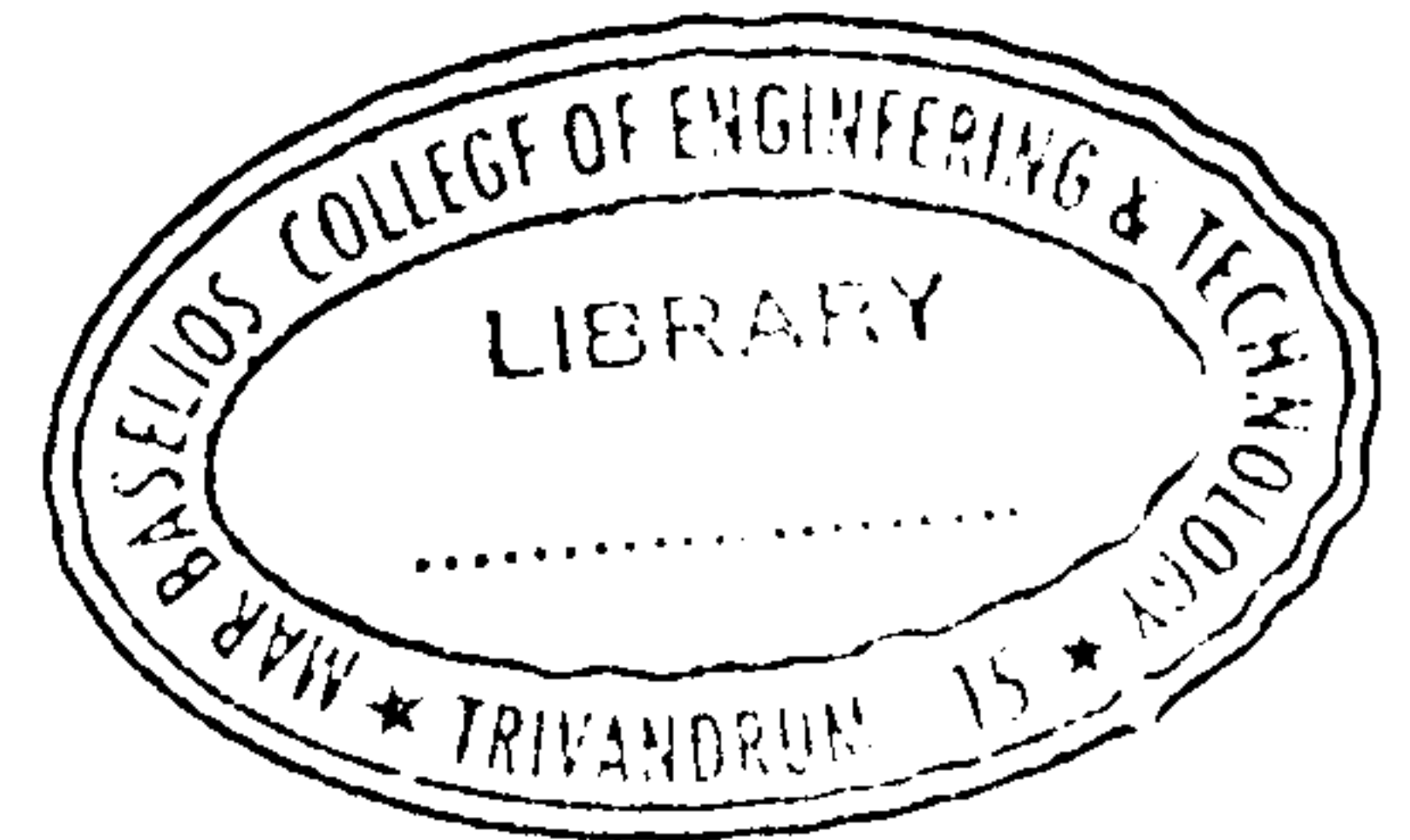


Reg No.: _____

06000CS352092002 Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech S6 (Supplementary) Examination, September 2020



Course Code: CS352

Course name: COMPREHENSIVE EXAM (CS)

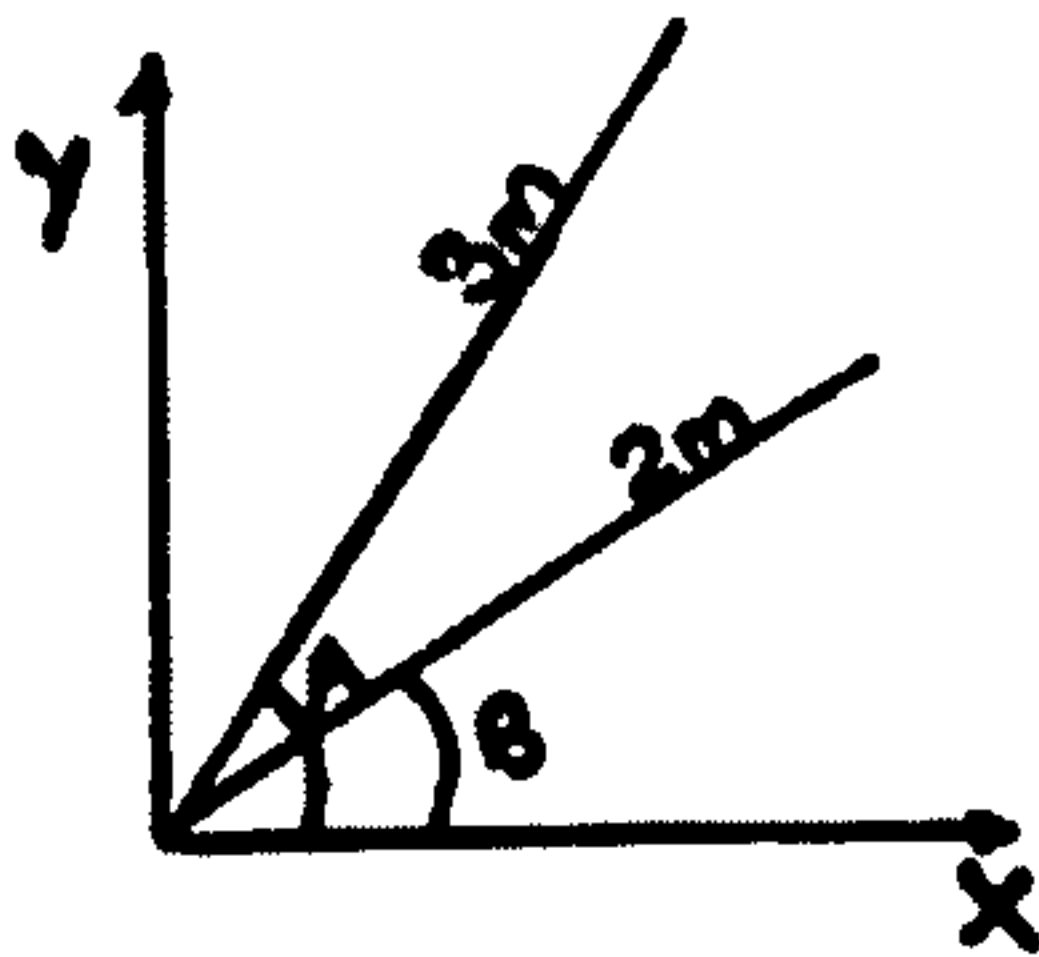
Max. Marks: 50

Duration: 1 Hour

- Instructions:**
- (1) Each question carries one mark. No negative marks for wrong answers
 - (2) Total number of questions: 50
 - (3) All questions are to be answered. Each question will be followed by 4 possible answers of which only ONE is correct.
 - (4) If more than one option is chosen, it will not be considered for valuation.
 - (5) Calculators are not permitted

PART A - COMMON COURSES

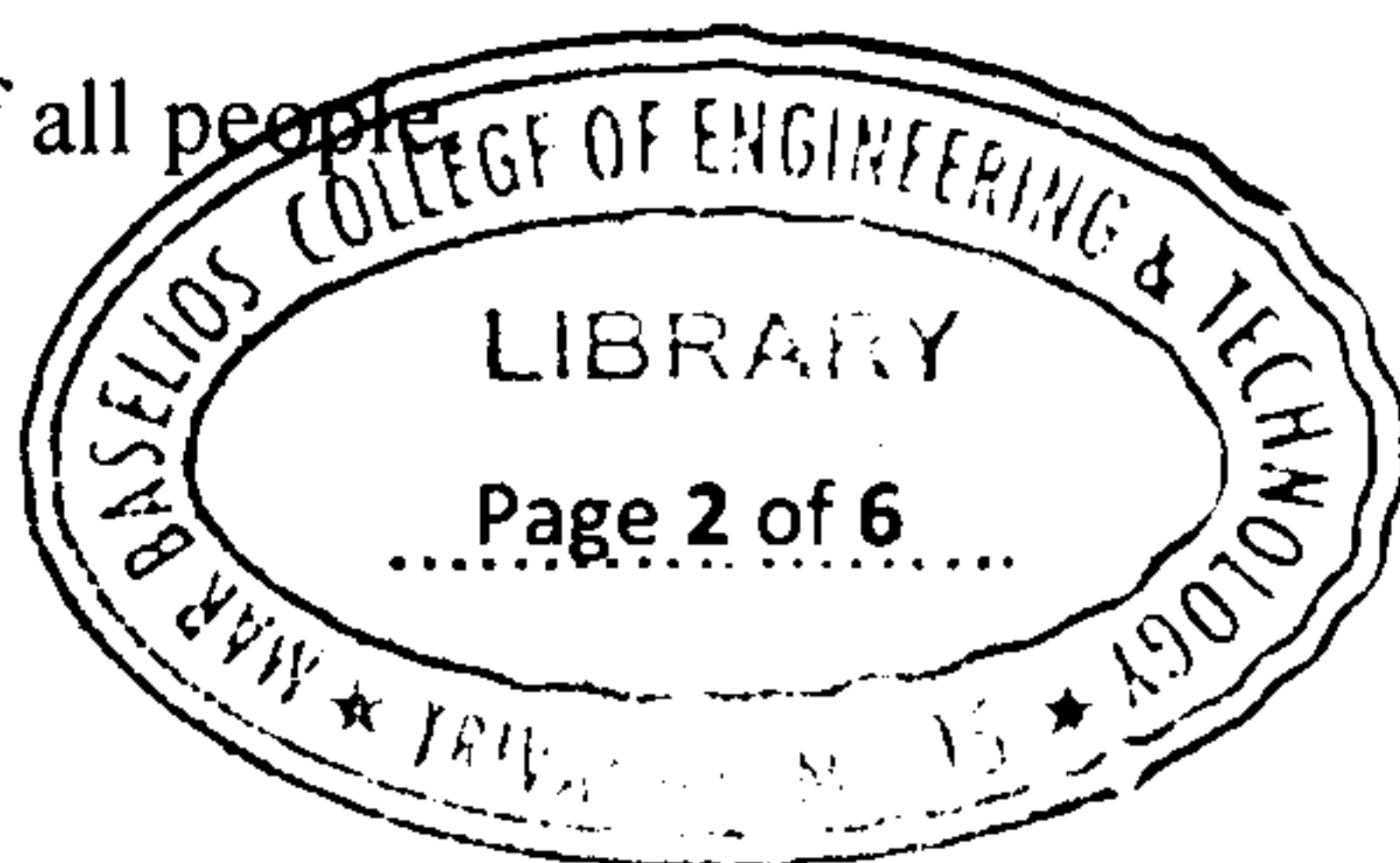
1. If $\vec{r} = x\hat{i} + y\hat{j} + z\hat{k}$, the gradient of \vec{r} is
(a) 0 (b) 3 (c) $x + y + z$ (d) 1
2. General solution of the Differential Equation $y'' - 5y' + 6y = 0$ is
(a) $ae^{2x} + be^{3x}$ (b) $ae^{-2x} + be^{-3x}$ (c) $ae^{-2x} + be^{3x}$ (d) $ae^{2x} + be^{-3x}$
3. A line AB is on the horizontal plane inclined to a vertical plane at 45 degrees, which view from the following gives the actual length of the line AB?
(a) Isometric view (b) Top view (c) Front view (d) Side view
4. A circle will appear in isometric drawings as
(a) Circle (b) Ellipse (c) Cycloid (d) Parabola
5. When a number of forces meet at a point and their line of action does not lie in one plane then those forces are called as
(a) Coplanar collinear forces (b) Coplanar concurrent forces (c) Non-coplanar non concurrent forces (d) Non-coplanar concurrent forces
6. In the figure shown below, A=60 degree and B=30 degree. Calculate the total length obtained by adding the x-axis component of both the vectors.



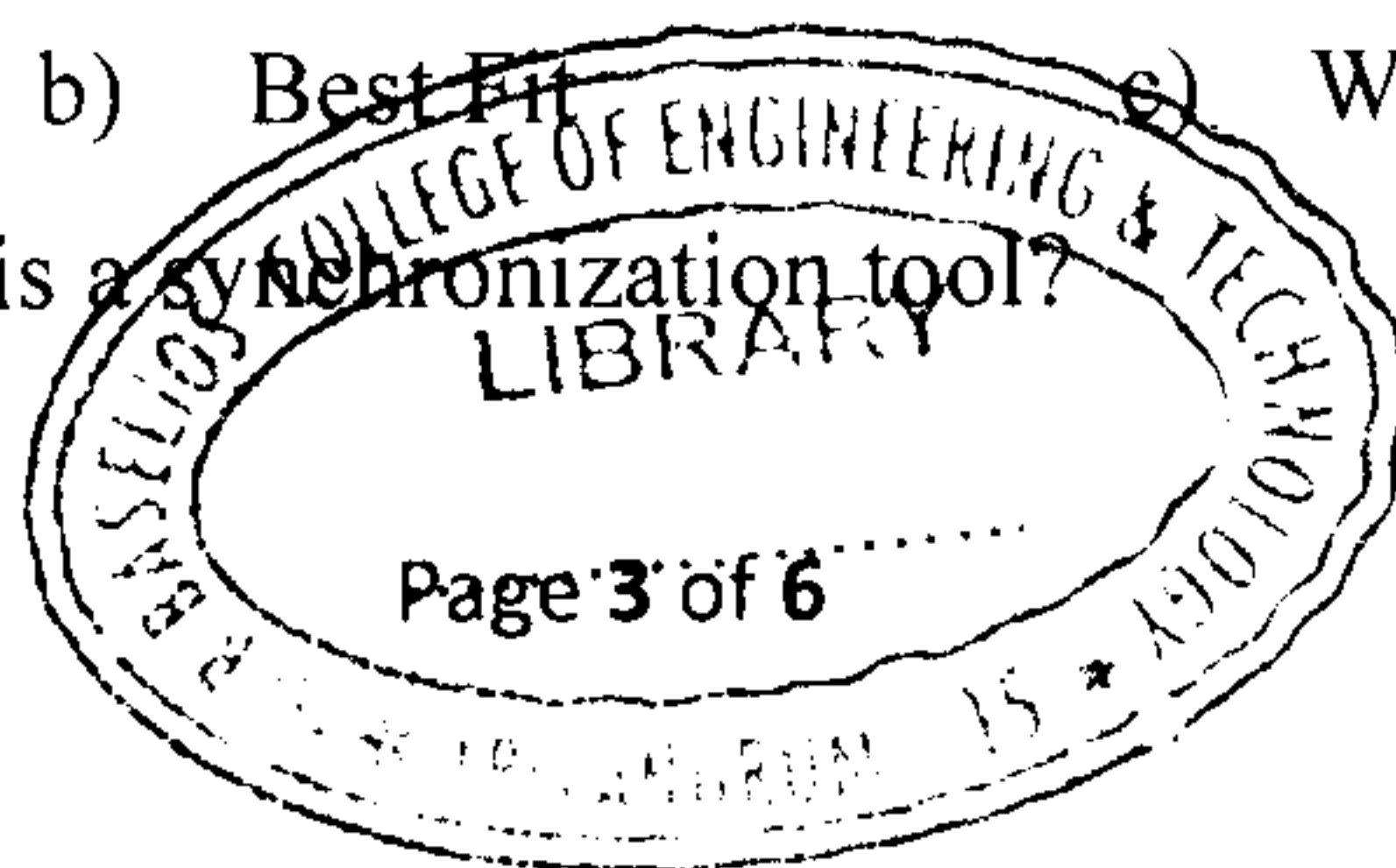
- (a) 4.13 m (b) 3.86 m (c) 4.08 m (d) 3.23 m
7. Which of the given item uses more number of modules for design?
 (a) Ink Pen (b) Pencil (c) Note Book (d) Umbrella
8. Objectives trees are hierarchical lists of the client's ----- for the design that branch out into tree-like structures.
 (a) Constraint (b) Objective (c) Shape (d) Cost
9. The measure of the impact of our activities have on the environment, in particular in climate change is called as
 (a) Carbon trading (b) Carbon Foot Print (c) Carbon credit (d) Sequestration
10. How can we determine carbon dioxide equivalents?
 (a) By multiplying the quantity of the gas by its global warming potential
 (b) By multiplying the quantity of the gas by its pressure
 (c) By multiplying the quantity of the water by its global warming potential
 (d) By multiplying the quantity of the gas by its global cooling potential

PART B- CORE COURSES

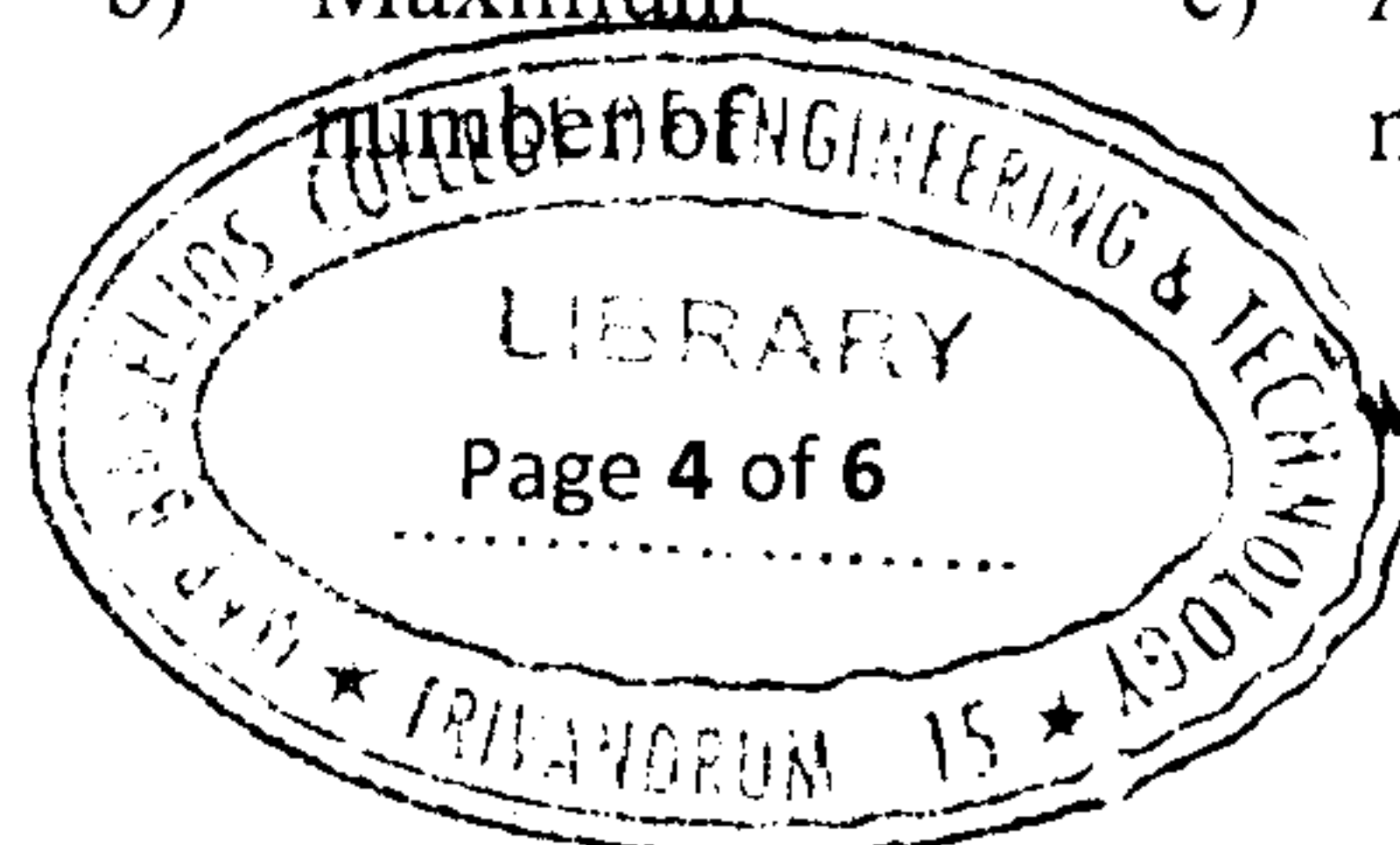
11. Which of the following is NOT a method of proof?
 a) Proof by induction b) Proof by cases c) Proof by counter example d) Proof by existential summarization
12. Which of the following statement is NOT a proposition?
 a) Sanjana is Reshma's sister b) Read this carefully c) $3+5=7$ d) New Delhi is the capital of India
13. The set $\{1,2,3,5,7,8,9\}$ under multiplication modulo 10 is not a group. Given below are four plausible reasons. Which one of them is false?
 a) It is closed b) 2 does not have an inverse c) 3 does not have an inverse d) 8 does not have an inverse
14. The statement, "Every teacher is sincere" where $C(x)$ is "x is a teacher" and $F(x)$ is "x is sincere" and the domain consists of all people



- a) $\exists x(C(x) \wedge F(x))$ b) $\forall x(C(x) \wedge F(x))$ c) $\exists x(C(x) \rightarrow F(x))$ d) $\forall x(C(x) \rightarrow F(x))$
15. How many bit strings of length eight either start with a bit 1 or end with two bits?
 a) 160 b) 200 c) 150 d) 192
16. What is the cardinality of $\{a, \{a\}, \{a, \{a\}\}\}$
 a) 4 b) 3 c) 5 d) None of the above
17. Registers R1 and R2 of a computer contain the decimal values 1200 and 4600. What is the effective address of the memory operand in Store R5, 30(R1, R2)
 a) 1230 b) 4630 c) 5830 d) 3400
18. For n-bit divisor and n-bit dividend, the number of restoring additions will be $n/2$ on the average.
 a) true b) false c) Can't say d) Depends on other factors also
19. The bus used to connect the monitor to the CPU is _____
 a) PCI bus b) Memory bus c) SCSI bus d) Rambus
20. A two-way set associative cache memory uses blocks of four words. The cache can accommodate a total of 2048 words from main memory. The main memory size is $128K \times 32$. What is the size of the cache memory?
 a) 1024×78 b) 1024×39 c) 1024×32 d) 1024×16
21. Highly encoded schemes that use compact codes to specify a smaller number of functions in each micro instruction is _____
 a) Horizontal organization b) Vertical organization c) Diagonal organization d) Centralized organization
22. The instruction fetch phase ends with
 a) Placing the data from the address in MAR into MDR
 b) Placing the address of the data into MAR
 c) Completing the execution of the data and placing its storage address into MAR
 d) Decoding the data in MDR and placing it in IR
23. What is the average waiting time of 4 processes with burst time 6, 8, 7, 3 using SJF?
 a) 7 b) 6 c) 9 d) 8
24. The program which interacts with the inner part of the kernel is called
 a) protocols b) Shell c) Device driver d) Compiler
25. Dynamic storage allocation problem can be solved using
 a) First Fit b) Best Fit c) Worst Fit d) All of these
26. Which one of the following is a synchronization tool?



- a) Semaphore b) Pipe c) thread d) socket
27. If there are 32 segments, each of size 1Kb, then the logical address should have _____ bits
 a) 13 b) 14 c) 15 d) 16
28. For a running process the PCB is stored in _____
 a) Process Register b) Process Table c) Program Counter d) Process Unit Counter
29. Consider the following recursive function fun(x, y). What is the value of fun(5, 3)?
- ```
int fun(int x, int y)
{
 if (x == 0)
 return y;
 return fun(x - 1, x + y);
}
```
- a) 18      b) 13      c) 15      d) 14
30. The minimum number of fields with each node of a doubly linked list is  
 a) 1      b) 2      c) 3      d) 4
31. Which one of the following is an application of stack data structure?  
 a) Managing function calls      b) Checking for balanced parenthesis      c) Arithmetic expression evaluation      d) All of the above
32. The following numbers are inserted into an empty binary search tree in the given order: 1,2,3,4,5,6,7,8,9. What is the height of the binary search tree (the height is the maximum distance of a leaf node from the root)?  
 a) 8      b) 4      c) 5      d) 3
33. You have to sort 1 GB of data with only 100 MB of available main memory. Which sorting technique will be most appropriate?  
 a) Heap sort      b) Quick sort      c) Merge sort      d) Insertion sort
34. If several elements are competing for the same bucket in the hash table, then is it called?  
 a) Diffusion      b) Replication      c) Collision      d) Duplication
35. Which of the following tree traversal uses a queue data structure?  
 a) Preorder      b) Inorder      c) Postorder      d) Level order
36. The result of evaluating the postfix expression  $10 \ 5 \ + \ 60 \ 6 \ / \ * \ 8 \ -$  is  
 a) 284      b) 142      c) 213      d) 71
37. Identify the correct statement?  
 a) Super key must be a minimal key      b) Maximum number of primary keys      c) A primary key must be a      d) Alternate keys are not any



candidate key  
possible in a  
relation is one.

candidate key

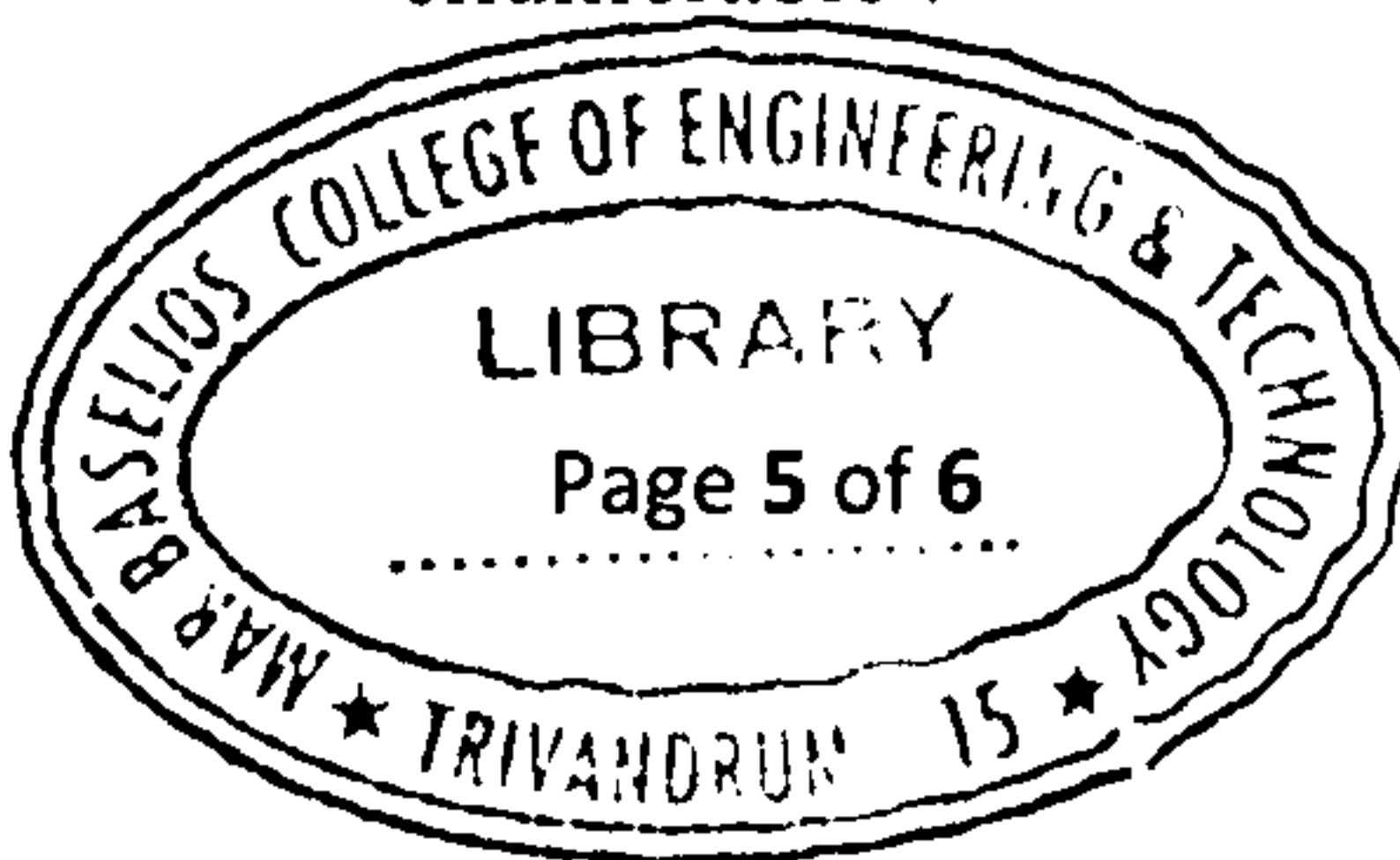
types of keys

38. A table Product contains 10 records. It has a column Price which is defined as UNIQUE. The SQL statement

SELECT COUNT(\*) FROM PRODUCT WHERE PRICE > ANY (SELECT PRICE FROM PRODUCT)

will give answer

- a) 0                      b) 1                      c) 10                      d) 9
39. Once the user has been notified that the transaction has completed, the updates to the database by the transaction must persist even if there are software or hardware failures; this requirement is known as
- a) Atomicity              b) Durability              c) Isolation              d) Consistency
40. Foreign key is the one in which the \_\_\_\_\_ of one relation is referenced in another relation.
- a) Primary key              b) Super key              c) Degree              d) Domain
41. 4NF is meant to handle
- a) Atomic attributes      b) Multi valued      c) Multiple keys      d) Transitive dependency
42. The indexing which is based on the ordering key fields of ordered files is
- a) primary indexing      b) Secondary indexing      c) Clustered indexing      d) Multi-level indexing
43. The true regular expression is
- a)  $(r*s^*)^* = (r+s)^*$       b)  $(r+s)^* = r^* + s^*$       c)  $r*s^* = r^* + s^*$       d) All the above
44. Let  $L=L_1 \cap L_2$  where  $L_1$  and  $L_2$  are  
 $L_1 = \{a^m b^m c^n b^n \mid m, n \geq 1\}$        $L_2 = \{a^i b^j c^k \mid i, j, k \geq 0\}$ . Then L is
- a) Not recursive              b) Regular              c) Context free but not regular              d) Recursively enumerable but not regular
45. Which of the following is true?
- a) Complement of a recursive language is recursive.  
b) Complement of a recursive enumerable language is recursive enumerable.  
c) Complement of a recursive language is either recursive or recursive enumerable.  
d) Complement of a Context Free Language is a Context Free Language.



46.  $S \rightarrow aSa|bSb|a|b$

The language generated by the above grammar over the alphabet  $\{a,b\}$  is the set of

- a) All palindromes    b) All odd length palindromes    c) All even length palindromes    d) Strings that begin and end with the same symbol
47. Linear Bounded Automata is a variant of  
 a) Finite Automata    b) Pushdown Automata    c) Turing Machine    d) None
48. Which is not decidable?  
 a) Language generated by Context Free Grammar is nonempty.    b) Equivalence of two Turing Machines    c) Language accepted by Finite Automata is nonempty.    d) Given a TM  $M$  and a string  $s$  and an integer  $k$ .  $M$  accepts  $s$  within  $k$  steps.
49. A term saying that no two transactions to be executed concurrently is referred as  
 a) Durability    b) Atomicity    c) Inconsistency    d) Isolation
50. Users can specify general constraints in queries, with the help of  
 a) Normalization    b) Assertions    c) Insertion    d) Sub-queries

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