

SUBJECT CODE C-05-03	SUBJECT COMPUTER SCIENCE AND APPLICATION	PAPER III
HALL TICKET NUMBER		QUESTION BOOKLET NUMBER
OMR SHEET NUMBER		
DURATION 2 HOUR 30 MINUTES	MAXIMUM MARKS 150	NUMBER OF PAGES 12
		NUMBER OF QUESTIONS 75

This is to certify that, the entries made in the above portion are correctly written and verified.

Candidates Signature

Name and Signature of Invigilator

Instructions for the Candidates

అభ్యర్థులకు సూచనలు

- Write your Hall Ticket Number in the space provided on the top of this page.
- This paper consists of seventy five multiple-choice type of questions.
- At the commencement of examination, the question booklet will be given to you. In the first 5 minutes, you are requested to **open the booklet and compulsorily examine it as below** :
 - To have access to the Question Booklet, tear off the paper seal on the edge of this cover page. Do not accept a booklet without sticker-seal and do not accept an open booklet.
 - Tally the number of pages and number of questions in the booklet with the information printed on the cover page. Faulty booklets due to pages/questions missing or duplicate or not in serial order or any other discrepancy should be got replaced immediately by a correct booklet from the invigilator within the period of 5 minutes. Afterwards, neither the Question Booklet will be replaced nor any extra time will be given.
 - After this verification is over, the Test Booklet Number should be entered in the OMR Sheet and the OMR Sheet Number should be entered on this Test Booklet.
- Each item has four alternative responses marked (A), (B), (C) and (D). You have to darken the circle as indicated below on the correct response against each item.

Example : (A) (B) (C) (D)

where (C) is the correct response.
- Your responses to the items are to be indicated in the **OMR Answer Sheet given to you**. If you mark at any place other than in the circle in the Answer Sheet, it will not be evaluated.
- Read instructions given inside carefully.
- Rough Work is to be done in the end of this booklet.
- If you write your name or put any mark on any part of the OMR Answer Sheet, except for the space allotted for the relevant entries, which may disclose your identity, you will render yourself liable to disqualification.
- The candidate must handover the OMR Answer Sheet to the invigilators at the end of the examination compulsorily and must not carry it with you outside the Examination Hall. The candidate is allowed to take away the carbon copy of OMR Sheet and used Question paper booklet at the end of the examination.
- Use only Blue/Black Ball point pen.
- Use of any calculator or log table etc., is prohibited.
- There is no negative marks for incorrect answers.

- ఈ పుట పై భాగంలో ఇవ్వబడిన స్థలంలో మీ హాల్ టికెట్ నంబరు రాయండి.
- ఈ ప్రశ్న పత్రము డెబైబదు బహుళైచ్ఛిక ప్రశ్నలను కలిగి ఉంది.
- పరీక్ష ప్రారంభమున ఈ ప్రశ్నపత్రము మీకు ఇవ్వబడుతుంది. మొదటి ఐదు నిమిషములలో ఈ ప్రశ్నపత్రమును తెరిచి కింద తెలిపిన అంశాలను తప్పనిసరిగా సరిచూసుకోండి.
 - ఈ ప్రశ్న పత్రమును చూడడానికి కవర్ పేజీ అంచున ఉన్న కాగితపు సీలును చించండి. స్టిక్కర్ సీలులేని మరియు ఇదివరకే తెరిచి ఉన్న ప్రశ్నపత్రమును మీరు అంగీకరించవద్దు.
 - కవరు పేజీ పై ముద్రించిన సమాచారం ప్రకారం ఈ ప్రశ్నపత్రములోని పేజీల సంఖ్యను మరియు ప్రశ్నల సంఖ్యను సరిచూసుకోండి. పేజీల సంఖ్యకు సంబంధించి గానీ లేదా సూచించిన సంఖ్యలో ప్రశ్నలు లేకపోవుట లేదా నిజప్రతి కాకపోవుట లేదా ప్రశ్నలు క్రమపద్ధతిలో లేకపోవుట లేదా ఏదైనా తేడాలుండటం వంటి దోషపూరితమైన ప్రశ్న పత్రాన్ని వెంటనే మొదటి ఐదు నిమిషాల్లో పరీక్షా పర్యవేక్షకునికి తిరిగి ఇచ్చిమే దానికి బదులుగా సరిగ్గా ఉన్న ప్రశ్నపత్రాన్ని తీసుకోండి. తదనంతరం ప్రశ్నపత్రము మార్చబడదు అదనపు సమయం ఇవ్వబడదు.
 - పై విధంగా సరిచూసుకొన్న తర్వాత ప్రశ్నపత్రం సంఖ్యను OMR పత్రము పై అదేవిధంగా OMR పత్రము సంఖ్యను ఈ ప్రశ్నపత్రము పై నిర్దిష్టస్థలంలో రాయవలెను.
- ప్రతి ప్రశ్నకు నాలుగు ప్రత్యామ్నాయ ప్రతిస్పందనలు (A), (B), (C) మరియు (D) లుగా ఇవ్వబడ్డాయి. ప్రతి ప్రశ్నకు సరైన ప్రతిస్పందనను ఎన్నుకొని కింద తెలిపిన విధంగా OMR పత్రములో ప్రతి ప్రశ్నా సంఖ్యకు ఇవ్వబడిన నాలుగు వృత్తాల్లో సరైన ప్రతిస్పందనను సూచించే వృత్తాన్ని బాల్ పాయింట్ పెన్ తో కింద తెలిపిన విధంగా పూరించాలి.

ఉదాహరణ : (A) (B) (C) (D)

(C) సరైన ప్రతిస్పందన అయితే
- ప్రశ్నలకు ప్రతిస్పందనలను ఈ ప్రశ్నపత్రములో ఇవ్వబడిన OMR పత్రము పైన ఇవ్వబడిన వృత్తాల్లోనే పూరించి గుర్తించాలి. అలాకాక సమాధాన పత్రంపై వేరొక చోట గుర్తిస్తే మీ ప్రతిస్పందన మూల్యాంకనం చేయబడదు.
- ప్రశ్న పత్రము లోపల ఇచ్చిన సూచనలను జాగ్రత్తగా చదవండి.
- చిత్తుపనిని ప్రశ్నపత్రము చివర ఇచ్చిన ఖాళీస్థలములో చేయాలి.
- OMR పత్రము పై నిర్దిష్ట స్థలంలో సూచించవలసిన వివరాలు తప్పించి ఇతర స్థలంలో మీ గుర్తింపును తెలిపే విధంగా మీ పేరు రాయడం గానీ లేదా ఇతర చిహ్నాలను పెట్టడం గానీ చేసినట్లయితే మీ అనర్హతకు మీరే బాధ్యులవుతారు.
- పరీక్ష పూర్తయిన తర్వాత మీ OMR పత్రాన్ని తప్పనిసరిగా పరీక్ష పర్యవేక్షకుడికి ఇవ్వాలి. వాటిని పరీక్ష గది బయటకు తీసుకువెళ్లకూడదు. పరీక్ష పూర్తయిన తరువాత అభ్యర్థులు ప్రశ్న పత్రాన్ని, OMR పత్రం యొక్క కార్బన్ కాపీని తీసుకువెళ్లవచ్చు.
- నీలి/నల్ల రంగు బాల్ పాయింట్ పెన్ మాత్రమే ఉపయోగించాలి.
- లాగరిథమ్ టేబుల్స్, క్యాలిక్యులేటర్లు, ఎలక్ట్రానిక్ పరికరాలు మొదలగునవి పరీక్షగదిలో ఉపయోగించడం నిషేధం.
- తప్పు సమాధానాలకు మార్కులు తగ్గింపు లేదు.

COMPUTER SCIENCE AND APPLICATION

Paper – III

- How many flip-flops are required to construct mod-30 counter?
(A) 5 (B) 6
(C) 4 (D) 8
- An 8 stage ripple counter uses flip-flop with propagation delay of 75 nano seconds the pulse width of the strobe is 50 ns. The frequency of the I/P signal which can be used for proper operation of the counter approximately.
(A) 1 MHz
(B) 500 MHz
(C) 2 MHz
(D) 4 MHz
- The PCI bus is the important bus found in all new pentium system because
(A) It has plug and play
(B) It has ability to function with 64 bit data bus
(C) Any microprocessor can be interface do it with PCI controller or bus
(D) None of these
- The total number of memory accesses involved when an 8085 processor executes the instruction LDA 2003 is
(A) 1 (B) 2
(C) 3 (D) 4
- The clause in SQL that specifies that the query result should be sorted in ascending or descending order based on the values by one or more columns
(A) View (B) Order by
(C) Group by (D) Having
- The operation which is not considered as a basic operation in relational algebra
(A) Join (B) Selection
(C) Union (D) Cross product
- Which of the following is true?
(A) Implicit cursor are not named
(B) Implicit cursors must be developed by database developer
(C) Explicit cursor can handle tables with only 16 rows
(D) Explicit cursor does not occupy oracle's memory space
- Assume transaction A holds a shared lock R. If transaction B also request for a shared lock on R.
(A) It will result in deadlock
(B) It will immediately be rejected
(C) It will immediately be granted
(D) It will be granted as soon as it is releases by A



9. Which of the following signal have only a limited number of values ?

- (A) Analog (B) Digital •
(C) A or B (D) A and B

10. The combination of port number and IP address

- (A) Network address
(B) IP address
(C) Transport address
(D) Socket address •

11. What will be the output of program ?

```
# include <stdio. h >
int main( )
{
printf ("nn/n/n nn/n"):
return (0);
}
```

- (A) nothing
(B) nn/n/n nn
(C) nn/n/n
(D) compile time error •

12. Which of the following mode declaration is used in C++ to open a file for input ?

- (A) IOS :: app (B) in :: IOS
(C) IOS :: in • (D) IOS :: file

13. Consider the language

$$L_1 = \{0^i 1^j \mid i \neq j\}$$

$$L_2 = \{0^i 1^j \mid i = j\}$$

$$L_3 = \{0^i 1^j \mid i = 2\}$$

$$L_4 = \{0^i 1^j \mid i \neq 2\}$$

- (A) Only L_2 is context free
(B) Only L_2 and L_3 are context free ✓
(C) Only L_1 and L_2 are context free
(D) All are context free

14. Match the following :

- | | |
|-----------------------|-----------------------|
| I) Lexical analysis | 1) DAGIS |
| II) Code optimization | 2) Syntax tree |
| III) Code generation | 3) Push down automata |
| IV) Abelian group | 4) Finite automata |

- | | I | II | III | IV |
|-----|---|----|-----|-----|
| (A) | 1 | 2 | 4 | 3 |
| (B) | 4 | 2 | 3 | 1 |
| (C) | 4 | 1 | 2 | 3 • |
| (D) | 3 | 2 | 1 | 4 |

15. In comparison with static RAM and dynamic RAM memory has

- (A) Low power consumption and higher bit density •
(B) Higher power consumption and low bit density
(C) Lower bit density and lower power consumption
(D) Higher power consumption and lower bit density



16. If $A \rightarrow A\alpha/\beta$ is left recursive then its equivalent production are
- (A) $A \rightarrow \beta R, R \rightarrow \alpha R \mid \epsilon$ •
 - (B) $A \rightarrow \alpha R, R \rightarrow \beta R \mid \epsilon$
 - (C) $A \rightarrow \alpha R \mid \epsilon, R \rightarrow \beta R \mid \beta$
 - (D) None of these
17. The language $L_2 = \{a^n b^m c^m d^n/n \geq 1 \text{ and } m \geq 1\}$ is context free with grammar
- (A) $S \rightarrow aSd/aAd$
 $A \rightarrow bAc/bc$ •
 - (B) $S \rightarrow aSb/aAd$
 $A \rightarrow CA b/Cb$
 - (C) $S \rightarrow aSb/Cb$
 $A \rightarrow CA b/Cb$
 - (D) None of these
18. Parallelism can be achieved by which of the following levels ?
- (A) Instruction level
 - (B) Processor level
 - (C) Both A and B •
 - (D) None of these
19. Suppose that you have the major stock market data of the last several years available from a stock exchange and you would like to invest in shares of high-tech industrial companies. This can be done using
- (A) Cluster analysis
 - (B) Regression analysis •
 - (C) Outlier analysis
 - (D) Evaluation analysis

20. Working set model is used in memory management to implement the concept of
- (A) Swapping
 - (B) Principal of locality •
 - (C) Segmentation
 - (D) Thrashing
21. The intermediate code can be represented in
- (A) Syntax trees
 - (B) Postfix representation
 - (C) Three addressing code •
 - (D) All of the above
22. The regular expression for an identifier is given by
- (A) letter (letter/digit)* •
 - (B) digit (letter/digit)*
 - (C) (letter/digit)*
 - (D) all of the above
23. An operating system uses LRU page replacement algorithm for managing memory. Consider the following reference string
- 1, 8, 1, 7, 8, 2, 7, 2, 1, 8, 3, 8, 2, 1, 3, 1, 7, 1, 3, 7
- Which of the following number of page faults are generated assuming that the process has allocated four page frames ?
- (A) 2
 - (B) 4
 - (C) 5
 - (D) 6 •



24. Clean room software engineering in a process model which is
- (A) Agile model*
 - (B) Removes defects before they can precipitate serious hazards*
 - (C) Behaves like a spiral model
 - (D) Behaves like an incremental model
25. For a function of two variables, boundary value analysis yields
- (A) $4n + 3$ test cases
 - (B) $n + 4$ test cases
 - (C) $4n + 1$ test cases*
 - (D) none of these
26. The process of constructing an object is _____ and that resulting object is _____ of the class.
- (A) Constructor, destructor
 - (B) Constructor, instances
 - (C) Instantiation, instances •
 - (D) Instantiation, destructor
27. Which of the following sorting technique not using Swap function ?
- (A) Quick sort •
 - (B) Insertion sort
 - (C) Bubble sort
 - (D) None of these
28. The ASCII encoding of binary data
- (A) base 32 encoding
 - (B) base 64 encoding
 - (C) base 16 encoding
 - (D) base 8 encoding •
29. Which of the following layer changes bit into electromagnetic signals ?
- (A) Physical •
 - (B) Data link
 - (C) Transport
 - (D) Session
30. Which of the following algorithm never suffer from the Belady's anomaly ?
- (A) FIFO page replacement
 - (B) LRU page replacement
 - (C) Optimal page replacement •
 - (D) None of these
31. Any member function can find out the address of the object of which is a member
- (A) friend
 - (B) constructor
 - (C) this •
 - (D) none of these
32. Total number of page table entries for system with a 32 bit logical address space if the page size 4 KB
- (A) $2^{32}/2^{12}$ •
 - (B) $2^{12}/2^{32}$
 - (C) $12^2/2^{32}$
 - (D) none of these



33. The range of frequencies transmitted without being strongly attenuated is called

- (A) Voice grade line
- (B) Signal to noise ration •
- (C) Bandwidth
- (D) Maximum data rate

34. Match the following :

- | | |
|--|---------------------------|
| I) First generation mobile dominated by | 1) Digital voice |
| II) First generation mobile phone uses | 2) Analog voice |
| III) Second generation mobile phone uses | 3) Digital voice and data |
| IV) Third generation mobile phone use | 4) AMDS |

- | | I | II | III | IV |
|-----|---|----|-----|-----|
| (A) | 2 | 1 | 3 | 4 • |
| (B) | 4 | 3 | 1 | 2 |
| (C) | 3 | 2 | 1 | 4 |
| (D) | 4 | 1 | 2 | 3 |

35. Match the following :

- | | |
|--------------------|-------------------|
| I) OLAP | 1) Regression |
| II) OLTP | 2) Data warehouse |
| III) Decision tree | 3) RDBMS |
| IV) Newral N/W | 4) Classification |

- | | I | II | III | IV |
|-----|---|----|-----|-----|
| (A) | 2 | 3 | 4 | 1 |
| (B) | 2 | 3 | 1 | 4 • |
| (C) | 3 | 2 | 1 | 4 |
| (D) | 3 | 2 | 4 | 1 |

36. Total end to end delay in sending packet P ($L \rightarrow$ number of bits in the packet, $R \rightarrow$ transmission rate), if there are N routers from source to destination

- (A) N
- (B) $(N * L)/R$ •
- (C) $(Z * N * L)/R$
- (D) L/R

37. Which of the following is/are true (assume $P \neq NP$) ?

- (A) $NP \text{ complete} = NP$
- (B) $NP \text{ complete} \cap P = \phi$
- (C) $NP \text{ hard} = NP$
- (D) $P = NP \text{ complete}$ •

38. _____ Parser satisfy LL(1) grammar.

- (A) Universal
- (B) Bottom-up
- (C) Top-down •
- (D) Simple LR

39. When a class serves as base class for many derived classes situation called

- (A) Polymorphism
- (B) Hierarchical inheritance •
- (C) Hybrid inheritance
- (D) None of the above

40. Which of the following algorithm solves the all pairs shortest path problem ?

- (A) Floyd's algorithm
- (B) Dijkstra's algorithm •
- (C) Prims algorithm
- (D) Warshall's algorithm



41. An algorithm is made up of two independent time complexities, $f(n)$ and $g(n)$ then the complexities of algorithm is in the order of
- (A) $f(n) * g(n)$ (B) $\text{Max}(f(n), g(n))$ •
(C) $\text{Min}(f(n), g(n))$ (D) $f(n) + g(n)$
42. What will be the efficiency of a stop and wait protocol, if the transmission time for a frame is 20 ns and the propagation time is 30 ns ?
- (A) 20% (B) 25% •
(C) 40% (D) 66%
43. An objective function in general linear programming contains
- (A) Constant term
(B) Term other than variables
(C) Only term with variable
(D) Either constant term or variable •
44. Unbalanced transportation problem with m sources and n destinations the number of basic variables is
- (A) $m + n + 1$ (B) $m + n - 1$ •
(C) $m + n$ (D) $m + n + 2$
45. Optimality conditions are expressed as _____ in case all non basic calls.
- (A) Negligent costs
(B) Reduced costs •
(C) Advanced costs
(D) None of these

46. _____ is used to keep track of currently active activations.
- (A) Control stack • (B) Activation
(C) Execution (D) Symbol
47. Which of the following is true ?
- I) Binary search using linked list is an efficient
II) Binary search using arrays is an efficient
III) Binary search using greedy method is an efficient
IV) Binary search using dividend conquer method is an efficient
- (A) I and II (B) II and III
(C) I and III (D) II and IV •
48. The combination of attributes that may not be a candidate key but classifies the entity set on a particular characteristic
- (A) Candidate key
(B) Composite key
(C) Super key •
(D) Secondary key
49. Which of the following is not a characteristics of a relational database ?
- (A) Tables
(B) Tree like structure •
(C) Complex logical relationship
(D) Records



50. The logical structure of data with a many to many relationship
- (A) Network model •
 - (B) Tree
 - (C) Relationship
 - (D) None of these
51. Which of the following is not true about a java package ?
- (A) A package can be classified as a group of similar types of classes and interface
 - (B) Packages are used in order to avoid name conflicts and to control access of classes and interface
 - (C) A package cannot have another package inside it •
 - (D) Java uses file system directory to store package
52. Which search is complete and optimal when $h(n)$ is consistent ?
- (A) Best first search
 - (B) Depth first search
 - (C) Both A and B
 - (D) A* search •
53. When does one decides to re-engineer a product ?
- (A) When tools to support restructuring are disabled
 - (B) When system crashes frequently
 - (C) When H/W or S/W support becomes absolute
 - (D) Subsystems of a larger system require maintenance •
54. Which is omitted in prolog unification algorithm ?
- (A) Variable check
 - (B) Occur check •
 - (C) Proposition check
 - (D) Both C and B
55. The distance between two code-word is equal to the _____ of the third code word, which is the sum of the first two code words ?
- (A) size •
 - (B) weight
 - (C) minimum distance
 - (D) none of these
56. Dark characteristics in an image are better solved using
- (A) Laplace transformation
 - (B) Gaussian transformation •
 - (C) Histogram specification
 - (D) Power-law transformation
57. A Huffman code $A = 1$,
 $B = 000$, $C = 001$, $D = 01$
 $P(A) = 0.4$, $P(B) = 0.1$
 $P(C) = 0.2$, $P(D) = 0.3$
- The average number of bits per letter is
- (A) 1.9 bit •
 - (B) 8.0 bit
 - (C) 2.0 bit
 - (D) 2.1 bit



58. When a peripheral device needs immediate attention from the operations system if generates (n)
- (A) interrupt • (B) spool
(C) stack (D) page file
59. The algorithm which displays line-type attributes by plotting pixel spans is
- (A) Raster scan algorithm •
(B) Raster line algorithm
(C) Random scan algorithm
(D) Random line algorithm
60. In fixed head discs, rotational delay plus transfer time is equal to
- (A) Access time •
(B) Delay time
(C) Processing time
(D) Storage time
61. The competitive learning algorithm is used by following networks for clustering
- (A) Multilayer perceptrons
(B) Self organized maps
(C) Bolzman machine •
(D) Radial basis function networks
62. Which of the following are the limitations of back propagation learning ?
- (A) Slow convergence
(B) Local minimum problem
(C) Scaling
(D) All of the above •
63. Which of the following pair of RE are not equivalent ?
- (A) $1(01)^*$ and $(10)^*1$
(B) $x(xx)^*$ and $(xx)^*x$
(C) $(ab)^*$ and a^*b^* ✗
(D) x^* and x^*x^* •
64. A push down automata behaves like an FSM, when the number of auxiliary memory it has n
- (A) 0 • (B) 1
(C) 2 (D) None of these
65. Consider the two grammars
- $G_1: S \rightarrow abAB/ba$
 $A \rightarrow aaa$
 $B \rightarrow aA/bb$
- $G_2: S \rightarrow abAaA/abAbb/ba$
 $A \rightarrow aaa$
- Choose the correct statement
- (A) The language generated by G_1 is a subset of G_2 •
(B) The language generated by G_2 is a subset of G_1
(C) There is no relation between G_1 and G_2
(D) None of these



66. Which of the following is not true regarding phrase level recovery ?
- (A) It can be implemented in predictive parsers by filling up the blank entries in the predictive parse table with pointers to error handling routines
 - (B) The routines can insert, modify, delete symbols in the input
 - (C) It is based on the principle that when an error is detected, the parser will skip the remaining input until a synchronizing token is encountered in the input •
 - (D) None of the above
67. Among the directory entries i-nod and the file contents which will be changed when a file is updated
- (A) only directory entry and file contents
 - (B) only i-node and file content•
 - (C) all the three
 - (D) none of the above
68. Three address code statements are typically implemented in the compiler as
- (A) Records
 - (B) Hash table•
 - (C) Symbol tables
 - (D) Linked lists
69. In developing a multi-view drawing the drafter can use a _____ line to help the top and right side views.
- (A) Object
 - (B) Hidden
 - (C) Dimension•
 - (D) Miter
70. The command 'umask-s'
- (A) Prints the current mask using symbolic notation •
 - (B) Prints the current mask using octal number
 - (C) Sets the mask to 000
 - (D) Sets the mask to 777
71. In an image compression system 16384 bits are used to represent 256×256 image with 256 gray levels. What is the compression ration for this system ?
- (A) 1
 - (B) 2•
 - (C) 4
 - (D) 8
72. The command line 'hash'
- (A) Manages a internal hash table
 - (B) Find and remember the full path name of the specified command
 - (C) Displays used command names and the number of hits
 - (D) All of the above •
73. Which of the following is not a size metric ?
- (A) LOC
 - (B) Cyclomatic complexity•
 - (C) Program length
 - (D) Function count
74. Which of the following is the largest community is classification of e-commerce ?
- (A) B 2 B•
 - (B) B 2 C
 - (C) B 2 G
 - (D) G 2 G
75. Which of the following requires a device driver ?
- (A) Cache
 - (B) Main memory
 - (C) Disk•
 - (D) Register