



PART – A

For the word below, a contextual usage is provided. Pick the word from the alternatives given that is most **appropriate** in the given context.

1. Predicament: She began waving frantically at passing motorists as they sped by, but they remained oblivious to her predicament.
A) Gesture B) Prediction C) Intimation D) Dilemma
2. Four statements with blanks are given followed by four words. Choose the word that fits the set of statements the maximum number of times.
(I) Saddam Hussein must be persuaded to _____, because the Americans are certainly not going to.
(II) You cannot see television because it is on the _____
(III) It was a fierce competition, the loser being whoever chose to _____ first.
(IV) The corrupt policeman decided to _____ at this particular transgression.
A) Wink B) Bow C) Blink D) Abdicate
3. Identify the correctly spelt word out of the following options.
A) Ecceptable B) Neccessary C) Collectible D) Definatly
4. A sentence is given in the direct speech and its equivalent statement in the indirect speech is given in the options. Choose the grammatically correct option closest in meaning to the sentence given in the question.
He said, “Bravo! You have done well.”
A) He applauded him
B) He told Bravo! he had done well
C) He applauded him and told him you have done well
D) He applauded him, saying that he had done well.
5. Which of the following words is an antonym of the word ‘reverently’ ?
A) Respectfully B) Admiringly C) Insincerely D) Ardently
6. Find the odd one out.
A) Green B) immature C) Fresh D) Emerald

Directions for questions 7 and 8 : Select the option that fits in the given blanks the maximum number of times.

7. She could not _____ her bad luck. One should _____ one’s promise. He has no _____ for her feelings. He is trying his best to _____ up the reputation of his family.
A) Fulfill B) Believe C) Idea D) Keep



8. It was difficult to maintain a _____ foothold on the slope. He is a _____ believer in communism. His future looks _____. My team managed to _____ a place in the finals.

- A) Firm B) Secure C) Staunch D) Grim

9. Arrange the phrases to form a meaningful sentence.

- a) in addition to posing a threat to wildlife
- b) associated with big dams
- c) the creation of reservoirs and construction of roads and buildings
- d) affect the quantity
- e) of rain and seepage of water in the catchment area

- A) acdeb B) baecd C) cbdea D) abcde

10. The following question consists of two capitalized words which share a certain relationship with each other, followed by 5 pairs of words. Choose the pair that is related to each other in the **same way** as the capitalized pair.

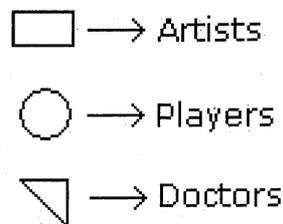
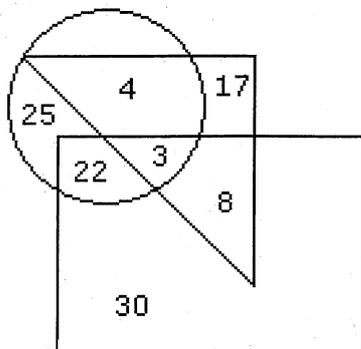
LOOK : OGLE

- A) Smile : Stroll B) Breathe : Gasp
C) Ring : Talk D) Plead : Punish

11. The “Earth-Hour” - the planets largest movement for the environment is organized by

- A) World Wide Fund for Nature B) UNEP
C) IUCN D) UNESCO

Directions for questions 12 to 16 : Use the picture to choose the correct answer from the options given below each question.



12. How many doctors are neither artists nor players ?

- A) 17 B) 5 C) 10 D) 30



13. How many doctors are both players and artists ?
A) 22 B) 8 C) 3 D) 30
14. How many artists are players ?
A) 5 B) 8 C) 25 D) 16
15. How many players are neither artists nor doctors ?
A) 25 B) 17 C) 5 D) 10
16. How many artists are neither players nor doctors ?
A) 10 B) 17 C) 30 D) 15

Directions for questions 17 to 20 : Choose the correct answer from the options given below each question.

17. A told B, “The girl I met yesterday was the youngest daughter of the brother-in-law of my friend’s mother.” How is the girl related to A’s friend ?
A) Niece B) Cousin C) Friend D) Daughter
18. If Arun’s birthday is on May 25 which is Monday and his sister’s birthday is on July 13. Which day of the week is his sister’s birthday ?
A) Monday B) Wednesday C) Thursday D) Friday
19. P, Q, R, S, T, U, V and W are sitting round the circle and are facing the centre :
P is second to the right of T who is the neighbour of R and V.
S is not the neighbour of P.
V is the neighbour of U.
Q is not between S and W. W is not between U and S.
Which two of the following are not neighbours ?
A) RV B) UV C) RP D) QW
20. Statements : Population increase coupled with depleting resources is going to be the scenario of many developing countries in days to come.
Conclusions :
I : The population of developing countries will not continue to increase in future.
II : It will be very difficult for the governments of developing countries to provide its people decent quality of life.
A) Only conclusion I follows B) Only conclusion II follows
C) Either I or II follows D) Neither I nor II follows



PART – B

26. Consider the matrix as given below.

$$\begin{bmatrix} 1 & 2 & 3 \\ 0 & 4 & 7 \\ 0 & 0 & 3 \end{bmatrix}$$

Which one of the following options provides the CORRECT values of the Eigen values of the matrix ?

- A) 1, 4, 3 B) 3, 7, 3 C) 7, 3, 2 D) 1, 2, 3

27. Define $f(n) = (n/2) + (1 - (-1)^n)/4$ for all $n \in \mathbb{Z}$. Thus, $f: \mathbb{Z} \rightarrow \mathbb{Z}$, where \mathbb{Z} is the set of all integers. In this context which of the following is correct ?

- A) f is not a function from $\mathbb{Z} \rightarrow \mathbb{Z}$ because $n/2 \notin \mathbb{Z}$.
 B) f is a function and is onto and one-to-one.
 C) f is a function and is not onto but is one-to-one.
 D) f is a function and is onto but not one-to-one

28. Consider the following system of equations in three real variables X_1 , X_2 and X_3

$$\begin{aligned} 2X_1 - X_2 + 3X_3 &= 1 \\ 3X_1 - 2X_2 + 5X_3 &= 2 \\ -X_1 + 4X_2 + X_3 &= 3 \end{aligned}$$

This system of equations has

- A) no solution
 B) a unique solution
 C) more than one but a finite number of solutions
 D) an infinite number of solutions

29. Let $f: X \rightarrow Y$ and $g: Y \rightarrow Z$. Let $h = g \circ f: X \rightarrow Z$. Suppose g is one-to-one and onto. Which of the following is FALSE ?

- A) If f is one-to-one then h is one-to-one and onto.
 B) If f is not onto then h is not onto.
 C) If f is not one-to-one then h is not one-to-one.
 D) If f is one-to-one then h is one-to-one.

30. In Ethernet when Manchester encoding is used, the bit rate is

- A) Half the baud rate B) Twice the baud rate
 C) Same as the baud rate D) None of the above



31. A serial transmission T_1 uses 8 information bits, 2 start bits, 1 stop bit and 1 parity bit for each character. A synchronous transmission T_2 uses 3 eight bit sync characters followed by 30 eight bit information characters. If the bit rate is 1200 bits/second in both cases, what are the transfer rates of T_1 and T_2 ?
- A) 100 characters/sec, 153 characters/sec
 - B) 80 characters/sec, 136 characters/sec
 - C) 100 characters/sec, 136 characters/sec
 - D) 80 characters/sec, 153 characters/sec
32. The Protocol Data Unit (PDU) for the application layer in the Internet stack is
- A) Segment
 - B) Datagram
 - C) Message
 - D) Frame
33. Which one of the following statements is FALSE ?
- A) TCP guarantees a minimum communication rate
 - B) TCP ensures in-order delivery
 - C) TCP reacts to congestion by reducing sender window size
 - D) TCP employs retransmission to compensate for packet loss
34. Which of the following is the most common example of a situation for which the main parameter of interest is a population proportion ?
- A) A binomial experiment
 - B) A normal experiment
 - C) A randomized experiment
 - D) An observational study
35. The probability $p = 0.80$ is that a patient with a certain disease will be successfully treated with a new medical treatment. Suppose that the treatment is used on 40 patients. What is the “expected value” of the number of patients who are successfully treated ?
- A) 40
 - B) 20
 - C) 8
 - D) 32
36. The normal approximation to the binomial distribution is most useful for finding which of the following ?
- A) The probability $P(X = k)$ when X is a binomial random variable with large n .
 - B) The probability $P(X \leq k)$ when X is a binomial random variable with large n .
 - C) The probability $P(X = k)$ when X is a normal random variable with small n .
 - D) The probability $P(X \leq k)$ when X is a normal random variable with small n .



37. Aggregation is which of the following ?
- Expresses a part-of relationship and is a stronger form of an association relationship.
 - Expresses a part-of relationship and is a weaker form of an association relationship.
 - Expresses an is-a relationship and is a stronger form of an association relationship.
 - Expresses an is-a relationship and is a weaker form of an association relationship.
38. _____ means that the data used during the execution of a transaction cannot be used by a second transaction until the first one is completed.
- Consistency
 - Atomicity
 - Durability
 - Isolation
39. The database design that consists of multiple tables that are linked together through matching data stored in each table is called
- Hierarchical database
 - Network database
 - Object oriented database
 - Relational database
40. Backward recovery is which of the following ?
- Where the before-images are applied to the database
 - Where the after-images are applied to the database
 - Where the after-images and before-images are applied to the database
 - Switching to an existing copy of the database
41. Which one of the following delays the transmission of signal along the wire by one step (clock pulse) ?
- NAND box
 - DELAY box
 - OR box
 - AND box
42. If the expression $((2 + 3) * 4 + 5 * (6 + 7) * 8) + 9$ is evaluated with $*$ having precedence over $+$, then the value obtained is the same as the value of which of the following prefix expressions ?
- $++ * + 2 3 4 * * 5 + 6 7 8 9$
 - $+ * ++ 2 3 4 * * 5 + 6 7 8 9$
 - $* ++ 2 3 4 * * 5 ++ 6 7 8 9$
 - $* +++ 2 3 4 * * 5 + 6 7 8 9$
43. When used with an IC, what does the term “QUAD” indicate ?
- 2 circuits
 - 4 circuits
 - 6 circuits
 - 8 circuits



44. With regard to an AND gate, which statement is true ?
- A) An AND gate has two inputs and one output.
 - B) An AND gate has two or more inputs and two outputs.
 - C) If one input to a 2-input AND gate is HIGH, the output reflects the other input.
 - D) A 2-input AND gate has eight input possibilities.
45. Any set of Boolean operators that is sufficient to represent all Boolean expressions is said to be complete. Which of the following is not complete ?
- A) {AND, NOT}
 - B) {NOT, OR}
 - C) {AND, OR}
 - D) {NAND}
46. Choose the correct statement :
- A) Address operator cannot be applied to register variables
 - B) Address operator can be applied to register variables
 - C) Use of register declaration will increase the execution time
 - D) None of the above

47. Consider the following C code :

```
int f(int x)
{
    if (x < 1) return 1;
    else return f(x-1) + g(x);
}
int g(int x)
{
    if (x < 2) return 2;
    else return f(x-1) + g(x/2);
}
```

Which of the following, best describes the growth of f(x) as a function of x ?

- A) Logarithmic
 - B) Linear
 - C) Quadratic
 - D) Exponential
48. The worst case running time to search for an element in a balanced binary search tree with n^{2^n} elements is :
- A) $\Theta(n \log n)$
 - B) $\Theta(n^{2^n})$
 - C) $\Theta(n)$
 - D) $\Theta(\log n)$



57. A 4 KHz noiseless channel with one sample every 125 microseconds is used to transmit digital signals. If Delta modulation is selected, then how many bits per second are actually sent ?
A) 32 kbps B) 8 kbps C) 128 kbps D) 64 kbps.
58. The MAC (Media Access Control) address of the network card is used in both Ethernet and Token-Ring networks and is essential for communication. What does MAC provide ?
A) A logical address that identifies the workstation
B) A physical address that is randomly assigned each time the computer is started
C) A physical address that is assigned by the manufacturer
D) The logical domain address for the workstation
59. A particular parallel program computation requires 100 seconds when executed on a single processor. If 40 percent of this computation is “inherently sequential” (i.e., will not benefit from additional processors), then the theoretically best possible elapsed times for this program running with 2 and 4 processors, respectively, are:
A) 20 and 10 seconds B) 30 and 15 seconds
C) 50 and 25 seconds D) 70 and 55 seconds
60. A particular disk unit uses a bit string to record the occupancy or vacancy of its tracks, with 0 denoting vacant and 1 denoting occupied. A 32-bit segment of this string has the hexadecimal value D4FE2003. The percentage of occupied tracks for the corresponding part of the disk, to the nearest percent, is :
A) 12 B) 25 C) 38 D) 44
61. Let the page fault service time be 10 ms in a computer with average memory access time being 20 ns. If one page fault is generated for every 10⁶ memory accesses, what is the effective access time for the memory ?
A) 21 ns B) 30 ns C) 23 ns D) 35 ns
62. Consider the following table of arrival time and burst time for three processes P0, P1 and P2.

Process	Arrival time	Burst Time
P0	0 ms	9 ms
P1	1 ms	4 ms
P2	2 ms	9 ms

If the pre-emptive shortest job first scheduling algorithm is used and scheduling is carried out only at arrival or completion of processes, what is the average waiting time for the three processes ?

- A) 5.0 ms B) 4.33 ms C) 6.33 ms D) 7.33 ms



63. The hexadecimal number 'A0' has the decimal value equivalent to
A) 80 B) 256 C) 100 D) 160
64. In a compiler, keywords of a language are recognized during
A) parsing of the program
B) the code generation
C) the lexical analysis of the program
D) data flow analysis
65. The lexical analysis for a modern computer language such as Java needs the power of which one of the following machine models in a necessary and sufficient sense ?
A) Finite state automata
B) Deterministic pushdown automata
C) Non-Deterministic pushdown automata
D) Turing Machine
66. Which one of the following is a top-down parser ?
A) Recursive descent parser
B) Operator precedence parser
C) An LR(k) parser
D) An LALR(k) parser
67. Which of the following statements is/are TRUE for undirected graphs ?
P : Number of odd degree vertices is even
Q : Sum of degrees of all vertices is even
A) P only B) Q only
C) Both P and Q D) Neither P nor Q
68. DTD definition is used along with XML to specify
A) The data types of the contents of XML document
B) The presentation of XML document
C) The links with other documents
D) The structure of XML document



69. By an extranet we mean
- A) an extra fast computer network
 - B) the intranets of two co-operating organizations interconnected via a secure leased line
 - C) an extra network used by an organization for higher reliability
 - D) an extra connection to internet provided to co-operating organization
70. The packets of an internet message
- A) take a predetermined path
 - B) take a path based on packet priority
 - C) go along different paths based on path availability
 - D) take the shortest path from source to destination
71. HTML and XML are markup languages
- A) Specially developed for the web
 - B) Are based on SGML
 - C) Are versions of SGML
 - D) Independent of SGML
72. Which one of the following is not a client server application ?
- A) Internet chat
 - B) Web browsing
 - C) E-mail
 - D) Ping
73. A ring counter consisting of five Flip-Flops will have
- A) 5 states
 - B) 10 states
 - C) 32 states
 - D) Infinite states.
74. The complexity of multiplying two matrices of order $m \times n$ and $n \times p$ is
- A) mnp
 - B) mp
 - C) mn
 - D) np
75. What is the postfix form of the following prefix expression $-A/B * C \$ D E$?
- A) $ABCDE\$*/-$
 - B) $A-BCDE\$*/-$
 - C) $ABC\$ED*/-$
 - D) $A-BCDE\$*/$
76. The minimum number of multiplications and additions required to evaluate the polynomial
- $$P = 4x^3 + 3x^2 - 15x + 45$$
- is
- A) 6 and 3
 - B) 4 and 2
 - C) 3 and 3
 - D) 8 and 3



85. Which of the following is the process of selecting the data storage and data access characteristics of the database ?
- A) Logical database design
 - B) Physical database design
 - C) Testing and performance tuning
 - D) Evaluation and selecting
86. Out of the three problems S, Q and R, S is an NP-complete problem and Q and R are the two other problems not known to be in NP. Which one of the following statements is true if Q is polynomial time reducible to S and S is the polynomial time reducible to R ?
- A) Q is NP-complete
 - B) R is NP-complete
 - C) Q is NP-hard
 - D) R is NP-hard
87. From the options given below the statement, which is not necessarily true if X1 is the recursive language and X2 and X3 are the languages that is recursively enumerable but not recursive is
- A) $X2 \cap X1$ is recursively enumerable
 - B) $X2 \cup X1$ is recursively enumerable
 - C) $X2 - X1$ is recursively enumerable
 - D) $X1 - X3$ is recursively enumerable
88. The statement that holds TRUE is
- A) Infinite union of finite sets is regular
 - B) The union of two non-regular set is not regular
 - C) Every finite subset of a non-regular set is regular
 - D) Every subset of a regular set is regular
89. The language described by the regular expression $(0+1)^*0(0+1)^*0(0+1)^*$ over the alphabet $\{0, 1\}$ is the set of
- A) All strings containing at least two 1's
 - B) All strings containing at least two 0's
 - C) All strings that begin and end with either 0's or 1's
 - D) All strings containing the substring 00



SPACE FOR ROUGH WORK