ANALYSIS OF GATE 2018* (Memory Based)

Computer Science and Information Technology

General Aptitude
15%

Engineering Mathematics
7%

Operating System
10%

Compiler Design
6%

Computer Networks
7%

Programming and Data Structures
10%

Data Base Management System
4%

Digital Logic
4%

Design and Analysis of Algorithm
7%

Theory of Computation
7%

Computer Organization and Architecture
11%

Discrete Mathematics and Graph Theory
12%
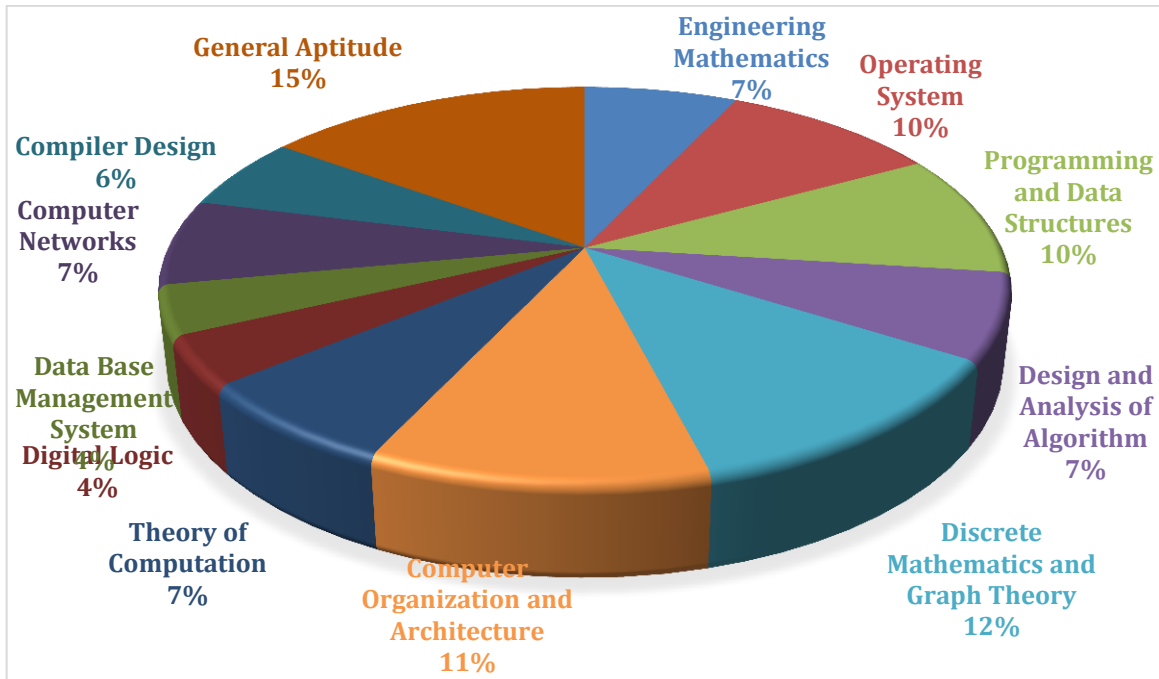
CS ANALYSIS-2018_4-Feb_Morning

SUBJECT	No. of Ques.	Topics Asked in Paper(Memory Based)	Level of Ques.	Total Marks
Engineering Mathematics	1 Marks: 3 2 Marks: 2	Linear Algebra, Eigen Values, Calculus, Probability	Easy	7
Operating System	1 Marks: 4 2 Marks: 3	CPU Scheduling, Demand Paging (Vertical Memory), Dead Lock, Main Memory, Disk Scheduling , Deadlock, IPC	Medium	10
Programming and Data Structures	1 Marks: 4 2 Marks: 3	Queues, C Programming, Programing Code	Medium	10
Design and Analysis of Algorithm	1 Marks: 1 2 Marks: 3	Heaps, Matrix Multiplication	Tough	7
Discrete Mathematics and Graph Theory	1 Marks: 2 2 Marks: 5	First Order Logic, Trees, Graph Theory (Chromatic Number), Set Theory, Spanning Trees	Medium	12
Computer Organization and Architecture	1 Marks: 3 2 Marks: 4	RISC Machine, Cache Memory, Instruction Pipeline, Number Presentation	Easy	11
Theory of Computation	1 Marks: 1 2 Marks: 2	CFL, NFA, Grammar	Medium	7
Digital Logic	1 Marks: 2 2 Marks: 1	K, Maps, Boolean Algebra	Medium	4
Data Base Management System	1 Marks: 0 2 Marks: 2	SQL,	Tough	4
Computer Networks	1 Marks: 3 2 Marks: 2	Protocols (TCP/NPP), Ethernet, TCP Protocol	Medium	7
Compiler Design	1 Marks: 2 2 Marks: 2	Operator Precedeuly, Lexical Analysis	Medium	6
General Aptitude	1 Marks: 5 2 Marks: 5	Functions, Grammar, Numbers, Work, Inference	Easy	15
Total	**65**			**100**
Faculty Feedback	Majority of the question were concept based. General Aptitude And Mathematics is Very Easy. Core Subject Questions were 50% easy, 30% medium and 20% tough.			

GATE 2018 Examination*

Computer Science and Information Technology

Test Date: 4-Feb-2018

Test Time: 9:00 AM 12:00 PM

Subject Name: Computer Science and Information Technology

General Aptitude

Q.1 - Q.5 Carry One Mark each.

1. The area of square is 'd'. What is the area of the circle which has the diagonal of the square as its diameter?

   (A) πd (B) πd^2

   (C) $\frac{1}{4}\pi d^2$ (D) $\frac{1}{2}\pi d$

   [Ans. D]

2. A _____ investigation can sometimes yield new facts, but typically organized once are more successful.

   (A) Meandering   (B) Timely

   (C) Consistent   (D) Systematic

   [Ans. A]

3. Find out missing one in the given series:

   2, 12, 60, 240, 720, 1440,······,0.

   (A) 2880   (B) 1440

   (C) 720   (D) 0

   [Ans. B]

4. What is the smallest natural number which when divided by 20 & by 42 & 76 leaves a remainder '7' is_____?

   (A) 3047   (B) 6047

   (C) 7987   (D) 63847

   [Ans. C]

5. From where are they bringing their book?

   _____bringing _____books from _____

   (A) Their, they are, there   (B) They are, their, there

   (C) There, their, they are   (D) They are, there, their
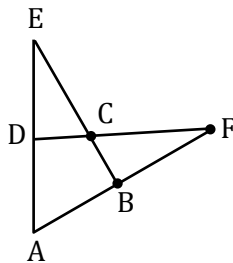
   [Ans. B]

Q.6 - Q.10 Carry Two Mark each.

6. In appreciative of social improvement completed in a town, a wealthy philanthropist decided to give gift of Rs.750 to each male senior citizen and Rs 1000 for female senior citizens. There are total 300 senior citizens and 8/9th of total men and 2/3rd of total women claimed the gift. What is the amount of money need to paid?
   (A) 15000   (B) 200000
   (C) 115000   (D) 151000
   [Ans. B]

7. A six sided unbiased dice with four green faces and two red faces is rolled '7' times outcome of the dice.
   (A) Three green + Four red   (B) Four green + Three red
   (C) Five green + Two red   (D) Six green + One red
   [Ans. C]

8. $\angle DEC + \angle BFC$ is_____?

   (A) $\angle BCD - \angle BAD$ (B) $\angle BAD + \angle BCF$
   (C) $\angle BAD + \angle BCD$ (D) $\angle CBA + \angle ADC$
   [Ans. *]

9. In a party 60% invited guests are male and 40% are female. If 80% of invited guests attended party and all female attended the party. What would be the ratio of male to female among attendees?
   (A) 2:3   (B) 1:1
   (C) 3:2   (D) 2:1
   [Ans. B]

10. If $pqr \neq 0, p^{-x} = \frac{1}{q}, q^{-y} = \frac{1}{r}, r^{-z} = \frac{1}{p}$ then $xyz =$?

    (A) -1 (B) $\frac{1}{pqr}$
    (C) 1 (D) pqr
    [Ans. C]

Technical

1. Temperature in Delhi, Guhwati is given in the table below with high, medium and low

	HD	MD	LD
HG	0.4	0.48	0.12
MG	0.1	0.65	0.25
LG	0.01	0.5	0.49

   From table P (HD/HG) =0.4

   P(LD/HG)=0.12

   P(HG)=0.2

   P(MG)=0.5

   P(LG)=0.3

   What is the probability of Guhwati has high temperature, than Delhi

   [Ans. *]Range: 0.245 to 0.245

   $$P(A/B) = \frac{P(A \cap B)}{P(B)}$$

   $P(A, B) = P(B)P(A/B)$

   P(HG, LD)+P(HG, MD)+P(MG, LD)

   P(HG) P(LD/HG)+P(HG) P(MD/HG)+P(MG)p(LD/MG)

   $0.2 \times 0.12 + 0.2 \times 0.48 + 0.5 \times 0.25 = 0.245$

2. N be NFA with 'n' states let k be define number of states in DFA. Which of the following condition is true

   (A) $k \geq 2^n$ (B) $k \leq n$

   (C) $k \leq n^r$ (D) $k \leq 2^n$

   [Ans. *]

3. Processer design characteristics

   I. Register –to –Register

   II. Fixed length Instruction

   III. Hardwired control unit

   (A) I, II   (B) II, IV

   (C) I, III   (D) I, II, III

   [Ans. D]

4. Post order for the binary tree is 8, 9, 6, 7, 4, 5, 2, 3, 1, and it in order is 8, 6, 9, 4, 7, 2, 5, 1, 3. Height of the binary tree is root to leaf node. Then find height of the binary tree_____

   [Ans. *] Range: 4 to 4

5. Let G be a finite group on 84 elements. The size of a largest proper sub group of G?

   [Ans. *] Will Update Soon

6. Matrix P has Eigen vectors are multiple of $\begin{bmatrix} 1 \\ 4 \end{bmatrix}$

   I.   P does not have an inverse
   II. P has a respected Eigen value
   III. P cannot be diagonalised
   Which of the following is true?
   (A) I and II only   (B) Only II
   (C) I and III   (D) II and III
   [Ans. C]

7. Two people P and Q roll a dice. The person with lower number wins. In case of a dice between them, they roll repeatedly unit there is no dice. Define a 'trial' as throw at a dice. And All '6' numbers are equally probable and each trial is independent. Find the probability that one of them wins
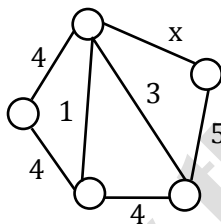   **[Ans. *] Range1 to 1**

8. I. $a^m\, b^n\, c^p\, d^q \mid m + p = n + q;\ m, n, p, q\ \geq 0$
   II. $a^m\, b^n c^p d^q \mid m = n,\ p = q,\ m, n, p \geq 0, q \geq 0$
   III. $a^m\, b^n c^p d^q \mid m = n = p$ and $p \neq q,\ m, n, p, q \geq 0$
   IV. $a^m\, b^n\, c^p d^q \mid mn = p + q;\ m, n, p, q\ \geq 0$
   Which of the above are CFL?
   (A) I, IV   (B) I, II
   (C) II, III   (D) II and IV
   [Ans. *] Will Update Soon

9. Numbers of minimum weight spanning trees are possible for 'x'=?

   [Ans. *] Will Update Soon

10. Consider producer consumer problems. Where both are sharing common buffer which is implemented with semaphore mechanism. Three semaphore variable are used, empty, full and mutex initialized 0,N,1 respectively. Let place hard disk variable are P,Q,R,S and semaphore operations are wait( ),signal ( ).The following code for produce consumer
    Producer ( )
    do {
    wait (P);
    wait (mutex);
    <shared buffer>;
    Signal<mutex>;
    Signal<Q>;

While (1);
}
Consumer ( )
do {
wait (R);
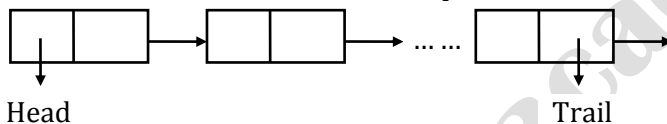wait (mutex);
<shared buffer>;
Signal<mutex>;
Signal<S>;
While (1);
}
Which of the following given correct solution
(A) P:Full,Q:Full,R:Empty,S:Empty
(B) P:Empty,Q: Empty ,R: Full, S: Full
(C) P:Full,Q: Empty, R:Empty, S:Full
(D) P:Empty,QFull ,R: Full, S: Empty
[Ans. C]

11. Consider the linear linked list with queue data solution

     Head   Trail
     Let en-queue be implemented by inserting a new node at head, de-queue is completed at
     trail. What is the time complexity for en-queue, de-queue
     (A) $\theta(1), \theta(1)$ (B) $\theta(1), \theta(n)$
     (C) $\theta(n), \theta(1)$ (D) $\theta(n), \theta(n)$
     [Ans. *] Will Update Soon

12. The set of all recursive enumerable languages
     (A) Closed under complementation   (B) Closed under intersection
     (C) Subset of set id recursive languages   (D) An un countable set
     [Ans. *] Will Update Soon

13. Consider the computer system with 2 Byte instruction has 16 integer
     register[$IR_0 \cdots\cdots IR_{15}$] and 64 floating point registers[$FR_0 \cdots\cdots FR_{63}$]. The instruction
     supports 4 categories.
     Type 1 supports 4 instructions and 3 Register operands (integer).
     Type 2 has '8' instructions, 2 integer register.
     Type 3 has 14 instructions, one integer register and 1 floating register($\Delta IR + \Delta FR$)
     and, Type 4 has 'N' instructions, one floating register (1 FR).
     What is the value of N_____?
     [Ans. *] Range: 411 to 411

14. Physical address space of the computer system is 2^P bytes, word size is 2^W bytes, cache memory has 2^N bytes and cache block size 2^M words. k-way set associative is used to mapping from main memory to cache memory. The size of the TAG bits_____.
    (A) $P - N - \log_2 k$
    (B) $P - M + \log_2 k$
    (C) $P - N - M - W \log_2 k$
    (D) $P - N - M - \log_2 k$
    [Ans. C]

15. $G = UV^T$

    $U = \begin{bmatrix} 1 \\ 2 \end{bmatrix}_{2 \times 1}$

    $V = \begin{bmatrix} 1 \\ 1 \end{bmatrix}_{2 \times 1}$

    Find the highest Eigen value of G?
    [Ans. *]Range: 3 to 3

16. $\int_0^{\pi/4} x \cos (x^2) dx =$_____
    [Ans. *]Range: 0.289 to 0.289

17. Let 'G' be a graph with 1001, vertices with district permutations $1, 2, 3, \cdots 100$ there exist edge between (u, v) only if the table adjacent number in the lable 'v' let 'y' denotes degree of vertices and 'z' denotes connected components then $y + 10z =$_____
    [Ans. *]   Will Update Soon

18. $\Psi = \exists s \exists t \exists u \forall v \forall w \forall x \forall y \ \Psi(s, t, u, v, w, r, y)$
    Where $\Psi (s, t, u, v, w, x, y)$ is quantifier free predicate symbols and possibly equal but no function symbol . Suppose Ψ has a model with a universe containing '7' elements
    Which is TRUE?
    (A) There exist at least one model Ψ with universe size less then Ψ equal to 3
    (B) No model exist of Ψ with universal size less than Ψ equal to 3
    (C) No model exist of Ψ with universal size grates than or equal to 7
    (D) Every model of Ψ has a universal size $=7$
    [Ans. *] Will Update Soon

19. Let 'G' be a simple undirected graph let T_D be a depth first search tree of 'G'
    let T_B be a breath first search tree of 'G'
    I.   No edge of 'G' is a cross edges with respect to T_D (Across edge in 'G' is between two nodes neither of which is an ancestor of two other in T_D)
    II. For every edge (u, v) of 'G', if 4 is at depth 'i' and v is depth 'j' in T_B $[i - j] = 1$
     Which is TRUE?
    (A) I   (B) II
    (C) I and II   (D) Neither of them
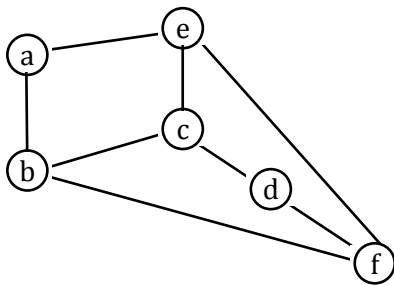   **[Ans. *] Will Update Soon**

20. Match the following:

P: UDP header part number	I.	48
Q: Ethernet MAC address	II.	8
R: IPV6 next header	III.	32
S: TCP header's sequence number	IV.	16

Codes:

(A) P: II, Q:I, R:IV, S:III

(B) P:IV, Q:I, R:II, S:III

(C) P:II, Q:I, S:III, R:IV

(D) P:I, Q:II, R:III, S:IV

[Ans. *] Will update soon

21. Chromatic number of graph_____

[Ans. *] Range: 3to 3

More Questions Updating Soon