Reg No.: _____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

SIXTH SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2018

Course Code: IT352

Course Name: COMPREHENSIVE EXAM (IT)

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.

(4) If more than one option is chosen, it will not be considered for valuation.

(5) Calculators are not permitted.

1 Which of the below is a global scale environmental issue?

(a) Eutrophication (b) Climate change

(c) Regional ozone (d) Pollution

2 In design process, which process is followed after selecting the material?

(a) Selecting factor of safety (b) Analysis of force

(c) Synthesis (d) Determining mode of failure

3 A point 'P' is above Horizontal Plane (HP) and in front of Vertical Plane (VP). The point is in

(a) First quadrant. (b) Third quadrant.

(c) Second quadrant. (d) Fourth quadrant

4 Addition of vectors is performed by applying:

(a) Rhombus law of vectors (b) Parallelogram law of vectors

(c) Square law of vectors (d) Lamis Theorem

5 The heating of earth's atmosphere due to trapped radiation is known as

a) Global warming b) Glass-House effect

c) Thermal effect d) Green House Effect

6 The series $\sum_{k=1}^{\infty} \frac{1}{k(k+1)}$ is

(a) Converges to $\frac{1}{2}$ (b) Converges to 0

(c) Converges to1 (d) Diverges

7 A transportation engineer who is involved in designing a traffic light system for an intersection is most likely to conduct a vehicle count at the intersection during which of the following stages of the engineering design process?

(a) Gathering information (b) Generating multiple solutions

(b) Selecting an appropriate solution (d) Analyzing the solution

8 What is the development of lateral surface of a cylinder?

(a) Rectangle (b) Trapezium (c) Circle (d) None of the above

9 Find $\iint_R (x+y)\, dy\, dx$, R is the region bounded by x=0, x=2, y=x, y=x+2

(a) 04 (b) 06 (c) 12 (d) 10

10 A body is vibrating with simple harmonic motion of amplitude 120 mm and frequency 5cps. Calculate the maximum velocity of the body.
(a) 3.77 (b) 2.77 (c) 1.5 (d) 2.90

11 The address resolution protocol (ARP) is used for
(a) Finding the IP address from the DNS
(b) Finding the IP address of the default gateway
(c) Finding the IP address that corresponds to a MAC address
(d) Finding the MAC address that corresponds to an IP address

12 The postfix form of the expression (A+ B)*(C*D- E)*F / G is?
(a) AB+ CD*E – FG /** (b) AB + CD* E – F **G /
(c) AB + CD* E – *F *G / (d) AB + CDE * – * F *G /

13 Which one is not a Real Time Operating System?
a) Vx Works b) RT Linux c)Windows CE d)Windows 7

14 Which one of the following is a synchronization tool?
(a) Thread (b) Pipe (c) Semaphore (d) Socket

15 The technique where the controller is given complete access to memory bus is
(a) Cycle stealing (b) Memory stealing
(c) Memory Con (d) Burst mode

16 Which of the following is not true of deadlock prevention and deadlock avoidance scheme
(a) In deadlock prevention, the request for resources is always granted, if the resulting state is safe
(c) Deadlock avoidance is less restrictive than deadlock prevention
(b) In deadlock avoidance, the request for resources is always granted, if the resulting state is safe
(d) Deadlock avoidance requires knowledge of resource requirements a prior

17 Which of the following memory allocation scheme suffers from external fragmentation?
(a)Pure demand paging (b) Segmentation (c) Swapping (d) Paging

18 A hash function f defined as f(key) =key mod 7 with linear probing, is used to insert the keys 37, 38, 72, 48, 98, 11, 56 into a table indexed from 0 to 6 . What will be the location of key 11?
(a) 3 (b) 4 (c) 5 (d) 6

19 Which of the following is NOT true with respect to a transparent bridge and a router?
(a) Both bridge and router selectively forward data packets
(c) A bridge builds up its routing table by inspect-ing incoming packets
(b) A bridge uses IP addresses while a router uses MAC addresses
(d) A router can connect between a LAN and a WAN

20 User datagram protocol is called connectionless because:
(a) All UDP packets are treated independently by transport layer
(b) Sends data as a stream of related packets
(c) Both (a) and (b)
(d) None of the mentioned

21 CPU Efficiency is very less in case of:
(a) Multi-Programming OS (b) Batch OS
(c) Multi-tasking OS (d) Multi-Processing OS

22 Which of the following are true statements?
i. Every conflict serializable schedule is view serializable

ii. Under constrained write, every view serializable is conflict serializable.

iii. Every view serializable schedule is conflict serializable

iv. Under unconstrained write, every view serializable is view serializable

(a)i only b) i and ii c) ii and iv d) i, ii and iv

23 Which one of the following is a set of one or more attributes taken collectively to uniquely identify a record?

(a) Foreign key (b)Sub key (c)Super key (d)None of the above

24 Quick sort algorithm is an example of

(a)Greedy approach (b)Improved binary search

(c)Dynamic Programming (d)Divide and conquer

25 Identify the approaches for green engineering

a) Waste reduction, Materials management, Pollution prevention, Product enhancement.

b) Waste disposal, Materials management, Pollution control, Product enhancement.

c) Zero waste, Material diversity, Pollution control, Product recycle.

d) Waste disposal, Materials recycle, Pollution control, Product reuse

26 Booth algorithm is used to multiply binary integers in

a) Signed magnitude representation b) Unsigned representation

c) 2's complement representation d) None of the above

27 The capacity to change the internal schema without having to change the conceptual schema is

a) Logical data independence b) Physical data independence

c) internal data independence d) conceptual data independence

28 Given the language L = {ab, aa, baa}, which of the following strings are in L*?

1) abaabaaabaa 2) aaaabaaaa 3) baaaaabaaaab 4) baaaaabaa

a) 1,2,3 b) 2,3,4 c) 1,2,4 d) 1,3,4

29 The high paging activity in which a process is spending more time paging than executing is called

a) Starvation b) Cycle stealing c) Thrashing d) Page fault

30 The best data structure to check whether an arithmetic expression has balanced parenthesis is

a)queue b)stack c)tree d)list

31 Consider the following statements :

I. Recursive languages are closed under complementation.

II. Recursively enumerable languages are closed under union.

III. Recursively enumerable languages are closed under complementation. Which of the above statements are true?

a) I only b) I and III c) I and II d) II and III

32 The number of states of the FSM, required to simulate the behaviour of a computer, with a memory capable of storing m words, each of length n bits is:

a)m x 2nb)2mnc) 2(m+n)d)None of the above

33 Efficient cache block replacement algorithm is:

a) FIFO b)LIFO c)LRU d)None of the above

34 A …… does not have a distinguishing attribute if its own and mostly are dependent entities, which are part of some another entity.
(a)Non attributes entity (b)Dependent entity (c)Weak entity (d)Strong entity

35 A deadlock situation arises if the following four conditions hold simultaneously in a system
a) Mutual exclusion, Hold and Wait, preemption and Circular wait
b) Mutual exclusion, Hold and Wait, No preemption and Circular wait
c) Mutex lock, Hold and Wait, preemption and Circular wait
d) Mutual exclusion, Hold and Wait, race condition and Circular wait

36 While opening a TCP connection, the initial sequence number is to be derived using a time-of-day (ToD) clock that keeps running even when the host is down. The low order 32 bits of the counter of the ToD clock is to be used for the initial sequence numbers. The clock counter increments once per millisecond. The maximum packet lifetime is given to be 64s. Which one of the choices given below is closest to the minimum permissible rate at which sequence numbers used for packets of a connection can increase?

a)0.015/s b)0.064/s c)0.135/s d)0.327/s

37 The width of the physical address on a machine is 40 bits. The width of the tag field in a 512 KB 8-way set associative cache is _____ bits

a)20 b)24 c)30 d)40

38 Suppose the numbers 7, 5, 1, 8, 3, 6, 0, 9, 4, 2 are inserted in that order into an initially empty binary search tree. The binary search tree uses the usual ordering on natural numbers. What is the in-order traversal sequence of the resultant tree?

a) 7 5 1 0 3 2 4 6 8 9 b). 0 2 4 3 1 6 5 9 8 7

c). 0 1 2 3 4 5 6 7 8 9 d). 9 8 6 4 2 3 0 1 5 7

39 In the _____ normal form, a composite attribute is converted to individual attributes.

a)Second b)Third c)First d)Fourth

40 Perform Column Matching :

A. Bridge	(i) Port No:80
B. Ethernet	(ii) CSMA/CD
C. Token ring	(iii) Layer 2
D Token bus	(iv)IEEE 802.4
E. HTTP	(v) IEEE 802.3

a)A- iii, B- i,C-v, D-iv, E-ii b) A-iii, B-ii, C-v,D-iv E-i

c) A-iii, B-ii, C-iv,D-v E-i d) A-i, B-iii, C-iv,D-v E-ii

41 Which of the following statements is TRUE about CSMA/CD

a) IEEE 802.11 wireless LAN runs CSMA/CD protocol

b) Ethernet is not based on CSMA/CD protocol
c) There is no contention in a CSMA/CD network
d) CSMA/CD is not suitable for a high propagation delay network like satellite network

42 Which addressing mode is most suitable for linear array searching?
a) Indirect b)Immediate c)Auto-increment d)Absolute

43 Which technique speeds up Multiplication operation?
a) Carry save addition of summands b)Booths algorithm
c) Array multiplier d)All of the above.

44 Given the basic ER and relational models, which of the following is INCORRECT?
a) An attributes of an entity can have more than one value
b) An attribute of an entity can be composite
c) In a row of a relational table, an attribute can have more than one value
d) In a row of a relational table, an attribute can have exactly one value or a NULL value

45 Consider the following statements about the context free grammar
$G = \{S \rightarrow SS, S \rightarrow ab, S \rightarrow ba, S \rightarrow \varepsilon\}$
I. G is ambiguous
II. G produces all strings with equal number of a's and b's
III. G can be accepted by a deterministic PDA
Which combination below expresses all the true statements about G?
a) I only b)I and III onlyc)II and III only d)I, II and III

46 Which of the following statement is false?
a) LBA recognizes Type 0 Grammars b) PDA recognizes Type 1 Grammars
b) LBA recognizes Type 2 Grammars d) PDA recognizes Type 3 Grammars

47 Which is suitable for cache memory implementation?
a) Static CMOS memory cell b) Dynamic memory cell
c) Flip Flops d) None of the above.

48 A BST contains the nodes 1,2,3,4,5,6,7,8. When the tree is traversed in pre-order , the sequence obtained is 5,3,1,2,4,6,8,7. If the tree is traversed in post order the sequence would be
a) 8,7,6,5,4,3,2,1 b) 1,2,3,4,8,7,6,5 c) 2,1,4,3,6,7,8,5 d) 2,1,4,3,7,8,6,5

49 Consider a B+-tree in which the maximum number of keys in a node is 5. What is the minimum number of keys in any non-root node?
a) 1 b) 2 c) 3 d) 4

50 Which of the following statement is false?
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