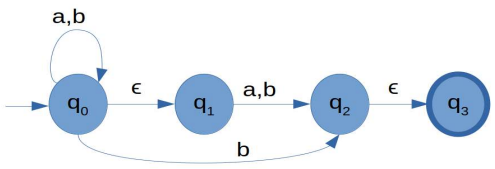
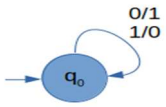
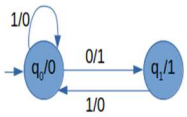
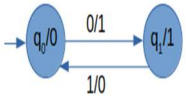
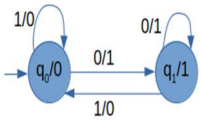
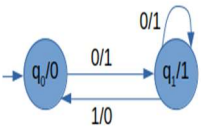
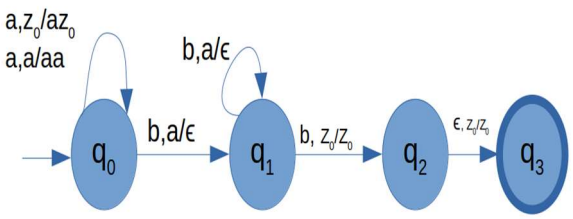
University of Mumbai
Examination June 2021
Examinations Commencing from 1st June 2021
Program: **Information Technology**
Curriculum Scheme: Rev2016
Examination: BE Semester IV
Course Code: ITC405 and Course Name: Automata Theory
Time: 2 hour Max. Marks: 80

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Recursively enumerable problems can be solved using _____
Option A:	Linear Bounded Automata
Option B:	Pushdown Automata
Option C:	Turing Machine
Option D:	Finite Automata
2.	Which of the following answers represent method/s of acceptance by a PDA
Option A:	Empty stack method, By reaching Final state
Option B:	Only Empty stack method
Option C:	Only by reaching final state
Option D:	PDA can accept input by having a specific state of stack contents.
3.	Consider NFA with epsilon moves shown in the transition diagram. Consider the device is in state 0 and input is symbol 'a'; which of the following options represents the states the device can reach if it takes this transition ? 
Option A:	{q0 , q2}
Option B:	{q0 , q1 , q2}
Option C:	{q0 , q1 , q2 , q3}
Option D:	{q0 , q1}
4.	Syntax analysis in the compiler is possible with which of the following machine.
Option A:	Mealy Machine
Option B:	Moore Machine
Option C:	Pushdown Automata
Option D:	Turing Machine

5.	Relate the following statement: Statement: All sufficiently long words in a regular language can have a middle section of words repeated a number of times to produce a new word which also lies within the same language.
Option A:	Turing Machine
Option B:	Pumping Lemma
Option C:	Arden's theorem
Option D:	Push Down Automata
6.	Which automaton accepts Type-2 grammar?
Option A:	Turing Machine
Option B:	PDA
Option C:	DFA
Option D:	NFA
7.	Select the correct option from below about the pair of states in FA.
Option A:	If a pair of states (q_i, q_j) is a pair of equivalent states of a FA then one of them must be final and the other must be a non final state.
Option B:	If a pair of states (q_i, q_j) is a pair of distinct states of a FA then both must be non-final.
Option C:	If a pair of states (q_i, q_j) is a pair of distinct states of a FA then both must be final.
Option D:	If a pair of states (q_i, q_j) is a pair of equivalent states of a FA then they must either be both final or both non-final.
8.	The minimum number of states required in a DFA (along with a dumping state) to check whether the 3rd bit is 1 or not for |n|>=3
Option A:	3
Option B:	4
Option C:	5
Option D:	1
9.	What is the language of the Turing machine?
Option A:	Regular language
Option B:	Context free language
Option C:	Recursive enumerable language
Option D:	Context sensitive language
10.	An NFA accepts a string w given input if _____
Option A:	There is exactly one walk from initial state to final state with label w on the transition graph of NFA.

Option B:	There is at least one walk from initial state to final state with label w on the transition graph of NFA.
Option C:	There is at least one walk from any state to the final state with label w on the transition graph of NFA.
Option D:	There is at most one walk from final state to initial state with label w on the transition graph of NFA.
11.	Which of the following statements is not true?
Option A:	Every language defined by any of the automata is also defined by a regular expression
Option B:	Every language defined by a regular expression can be represented using a PDA
Option C:	Every language defined by a regular expression can be represented using NFA with epsilon moves
Option D:	Regular expression is just another representation for any automata definition
12.	Which of the following statements is true?
Option A:	String ending in 01 over {0,1} can be accepted by desiging FA, PDA as well as TM.
Option B:	We cannot design FA with output to represent binary addition of 2 numbers.
Option C:	Language L of form 0^n1^n for n >=1 can be accepted by a FA.
Option D:	Language L over {0,1} where strings are more than size 4 where the second last symbol is always 1 cannot be accepted by any FA.
13.	The halting problem can tell _____.
Option A:	When the program can halt
Option B:	Whether or not the program will continue to run forever
Option C:	Whether string is accepted or not
Option D:	Whether Turing machine will halt or not
14.	Regular Expression R and the language it describes can be represented as:
Option A:	R, R(L)
Option B:	L(R), R(L)
Option C:	R, L(R)
Option D:	L, R
15.	The FA has to recognize a pattern “word”. How many states are required to recognize the pattern
Option A:	6
Option B:	5
Option C:	3
Option D:	4

16.	Consider the Mealy machine shown in the transition diagram below. Which is the correct option that represents an equivalent Moore machine. 
Option A:	
Option B:	
Option C:	
Option D:	
17.	Consider the following transition diagram for a PDA. Assume Z_0 represents an empty stack symbol. What will be the device state and stack content if partial input given is "aaabbb" 
Option A:	state q_2 Stack content is Z_0
Option B:	state q_2 Stack content is aZ_0
Option C:	state q_1 Stack content is Z_0
Option D:	state q_2 Stack content is ϵ
18.	Regular expression for strings which starts and ends with same letter over ∑={a,b}
Option A:	a(a+b)*a
Option B:	b(a+b)*b
Option C:	(a+b)(a+b)*(a+b)
Option D:	a(a+b)*a+b(a+b)*b

19.	The minimum number of states required by a FA to recognize a decimal number divisible by 4
Option A:	1
Option B:	2
Option C:	3
Option D:	4
20.	Which of the following language cannot be accepted by any deterministic PDA
Option A:	L= {All strings having aba as substring , over Σ={a,b}}
Option B:	L = {w : w is a palindrome over {a, b}* }
Option C:	L = {wdw^r: w string from {a, b}*, w^r is reverse of w and d is different from a and b }
Option D:	L = {a^n b^{m}a^n: n>=1,m>=1}

Q2	
A	**Solve any Two** **5 marks each**
i.	Write down the regular expression for the following language. a) L is a language for all strings over {0,1} having an odd number of 1s and any number of 0s. b) L is language for all strings over {0,1} having number of 10 or 11
ii.	Construct CFG for the languages represented by the following descriptions: a) Alternating sequence of 0 and 1 b) a^{n}b^{m}c^k where k=n+m
iii.	Design a Mealy machine to recognise all inputs over {a,b}* that have aba substring. Device should recognise substring by output 'y' as substring is found.
B	**Solve any One** **10 marks each**
i.	Design a PDA to accept L ={a^n b^{2n}: n>=1}. Clearly define all components of your device. Also show simulation of 1 valid and 1 invalid input string.
ii.	List application of Turing Machine. Design Turing Machine to accept the string of even length.
Q3.	
A	**Solve any Two** **5 marks each**
i.	State and explain closure properties of regular languages.
ii.	Explain power and limitations of regular grammar.
iii.	Design a DFA over {0,1}* starting and ending in 1.
B	**Solve any One** **10 marks each**
i.	Represent (a+b)*(ab+aa)b as NFA epsilon. Convert the same to minimized DFA
ii.	Let G be a grammar. Find Leftmost derivation and rightmost derivation and parse tree for the strings 0012222 and 111222 G: S →0S ∣ 1A ∣ 2B ∣ ϵ A→ 1A ∣ 2B ∣ ϵ B→ 2B ∣ ϵ

Course Code: ITC405 and Course Name: Automata Theory

Answer key

Question Number	Correct Option
Q1.	C
Q2.	A
Q3.	A
Q4	C
Q5	B
Q6	B
Q7	D
Q8.	C
Q9.	C
Q10.	B
Q11.	B
Q12.	A
Q13.	D
Q14.	C
Q15.	B
Q16.	C
Q17.	C
Q18.	D
Q19.	D
Q20.	B

University of Mumbai
Examination June 2021
Examinations Commencing from 1st June 2021

Program: **Information Technology**
Curriculum Scheme: Rev2016
Examination: BE Semester IV
Course Code:ITC402 and Course Name: Computer Networks

Time: 2 hour Max. Marks: 80

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	The Go-Back-N Sliding window Protocol uses 3-bit sequence number to assign numbers to the frames. Then Size of Sender window and Size of Receiver window is
Option A:	Sender Window size=7 , Receiver Window Size 1
Option B:	Sender Window size=3 , Receiver Window Size 3
Option C:	Sender Window size=1 , Receiver Window Size 1
Option D:	Sender Window size=8 , Receiver Window Size 1
2.	A bit string, 011111111100 , needs to be transmitted at the data link layer. What is the string actually transmitted after bit stuffing?
Option A:	0111111111100
Option B:	0111110111100
Option C:	0011111011110
Option D:	011110011111
3.	Which Carrier Sense Multiple Access protocol is used in Ethernet LANs?
Option A:	CSMA
Option B:	CSMA/CD
Option C:	CSMA/CA
Option D:	CSMA/CTS
4.	Ethernet frame contains
Option A:	Port address
Option B:	Logical Address
Option C:	Physical Address
Option D:	Socket Address
5.	Identify the transmission media of Wireless Local Area Network?
Option A:	Guided
Option B:	Unguided
Option C:	Connection-less
Option D:	Connection oriented
6.	FHSS is
Option A:	Modulation Technique
Option B:	Multiplexing technique
Option C:	Encoding technique
Option D:	Decoding Technique

7.	You have an IP address of 172.16.13.5 with a 255.255.255.128 subnet mask. What is your class of address and subnet address and bits used for subnetting?
Option A:	Class A, Subnet 172.16.13.0, 1 bit for subnetting
Option B:	Class B, Subnet 172.16.13.0, 9 bits for subnetting
Option C:	Class B, Subnet 172.16.0.0, 9 bits for subnetting
Option D:	Class B, Subnet 172.16.0.0, 1 bit for subnetting
8.	If the destination address of the received packet is 210.53.123.145 and netmask is 255.255.224.0 Find network address
Option A:	210.53.96.0
Option B:	210.53.123.0
Option C:	210.53.128.0
Option D:	None of These
9.	In OSPF header, which field is used to detect errors in the packet?
Option A:	Type
Option B:	Area ID
Option C:	Authentication type
Option D:	Checksum
10.	In open-loop control, policies are applied to _____
Option A:	Remove after congestion occurs
Option B:	Remove after sometime
Option C:	Prevent before congestion occurs
Option D:	Prevent before sending packets
11.	A subset of a network that includes all the routers but contains no loops is called
Option A:	Spanning tree
Option B:	Spider structure
Option C:	Spider tree
Option D:	Special tree
12.	An endpoint of an inter-process communication flow across a computer network is called _____
Option A:	pipe
Option B:	socket
Option C:	port
Option D:	machine
13.	What is the main advantage of UDP?
Option A:	More overload
Option B:	Reliable
Option C:	Low overhead
Option D:	Fast
14.	The client in socket programming must know which information?
Option A:	IP address of Server
Option B:	Port number
Option C:	Only its own IP address
Option D:	Both IP address of Server & Port number
15.	Backpressure technique can be applied only to _____
Option A:	Congestion networks

Option B:	Closed circuit networks
Option C:	Open circuit networks
Option D:	Virtual circuit networks
16.	In TCP/IP protocol as the information moves from lower to higher layer headers are ....
Option A:	Added
Option B:	Removed
Option C:	Merged
Option D:	Checked and added
17.	In simplex transmission, data flows in ....
Option A:	both direction
Option B:	in one direction
Option C:	both direction but not simultaneously
Option D:	both direction and simultaneously
18.	..... protocol is used to assign IP address in the network
Option A:	SMTP
Option B:	HTTP
Option C:	DHCP
Option D:	RIP
19.	DNS system is..... system
Option A:	Centralized
Option B:	Distributed
Option C:	Peer to Peer
Option D:	Hybrid
20.	Transport Layer offers ..... services
Option A:	Point to point
Option B:	End to end
Option C:	Process to process
Option D:	Both P2P and E2E

Q2. **(20 Marks)**	
A	**Solve any Two** **5 marks each**
i.	What are the limitations of OSI model?
ii.	Compare Lossless vs.Lossy compression techniques.
iii.	Consider an error detecting CRC with the generator G(x) =10011 Compute the transmitted bit sequence For the data bit sequence 1101011011.
B	**Solve any One** **10 marks each**
i.	Explain LSR routing algorithm and mention how it overcomes drawbacks of DVR?
ii.	Is slotted ALOHA performance is better than pure aloha? Justify your answer.

Q3. **(20 Marks)**	
A	**Solve any Two** **5 marks each**
i.	Write short note on -Framing methods

ii.	Which cable you will use to connect the machines to form a Local area network of an educational organization and Why?
iii.	Explain subnetting with example
B	**Solve any One** **10 marks each**
i.	How TCP controls the Congestion, explain in detail
ii.	Explain HDLC Protocol

Course Code: ITC402 and Course Name: Computer Networks

Answer Key

Question Number	Correct Option (Enter either 'A' or 'B' or 'C' or 'D')
Q1.	A
Q2.	B
Q3.	B
Q4	C
Q5	B
Q6	A
Q7	B
Q8.	A
Q9.	D
Q10.	C
Q11.	A
Q12.	B
Q13.	C
Q14.	D
Q15.	D
Q16.	B
Q17.	B
Q18.	C
Q19.	B
Q20.	C

University of Mumbai

Examination June 2021

Examinations Commencing from 1st June 2021

Program: **BE (Information Technology)**

Curriculum Scheme: Rev2016

Examination: SE Semester: IV

Course Code: ITC401 and Course Name: Applied Mathematics-IV

Time: 2 hour Max. Marks: 80

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Find the Greatest Common Divisor of 666 and 1414 by using Euclidean Algorithm.
Option A:	3
Option B:	1
Option C:	4
Option D:	2
2.	Integral solution of the equation $-63x + 23y = 7$ is
Option A:	$x = -4 \ \ \& \ \ y = -11$
Option B:	$x = 4 \ \ \& \ \ y = -11$
Option C:	$x = 4 \ \ \& \ \ y = 11$
Option D:	$x = -4 \ \ \& \ \ y = 11$
3.	From the following numbers, which number is a prime number?
Option A:	2737
Option B:	7293
Option C:	299
Option D:	509
4.	The remainder when 5 divides $(56)^{111}$ is _____
Option A:	2
Option B:	1
Option C:	0
Option D:	4
5.	Find x if $5^{19} \equiv x \ (mod\ 19)$
Option A:	17
Option B:	12
Option C:	5
Option D:	15
6.	If $7x \equiv 3(mod\ 5)$ then $x =$ ____
Option A:	1

Option B:	2
Option C:	4
Option D:	3
7.	Find value of Jacobi's symbol $\left(\frac{105}{1009}\right)$
Option A:	-1
Option B:	0
Option C:	-2
Option D:	1
8.	The Probability density function of a random variable X is X | 1 | 2 | 3 | 4 | 5 P(X=x) | k | 3k | 5k | 7k | 9k Find P$(2 < X < 5)$
Option A:	$\frac{12}{25}$
Option B:	$\frac{13}{25}$
Option C:	$\frac{14}{25}$
Option D:	$\frac{15}{25}$
9.	A continuous random variable has probability density function $f(x) = x - x^2; 0 \leq x \leq 1$. Find Mean
Option A:	$\frac{1}{12}$
Option B:	$\frac{1}{3}$
Option C:	$\frac{1}{6}$
Option D:	$\frac{5}{3}$
10.	The Moment Generating Function about origin of a random variable is $M_0(t) = \frac{3}{3-t}$. Find first moment about origin.

Option A:	$\frac{2}{3}$
Option B:	$\frac{1}{3}$
Option C:	$\frac{5}{9}$
Option D:	$\frac{4}{3}$
11.	If a random variable X follows Poisson distribution such that $P(X = 1) = 2P(X = 2)$ then find the value of $P(X = 4)$
Option A:	0.03754
Option B:	0.01532
Option C:	0.04945
Option D:	0.02879
12.	If a sample point lies in the critical region then
Option A:	Null Hypothesis is Accepted and Alternate Hypothesis is Rejected
Option B:	Null Hypothesis is Rejected and Alternate Hypothesis is Accepted
Option C:	Both Null Hypothesis and Alternate Hypothesis are Accepted
Option D:	Both Null Hypothesis and Alternate Hypothesis are Rejected
13.	The correlation coefficient r for the following data is

X	65	66	67	67	68	69	70	72
Y	67	68	65	68	72	72	69	71

Option A:	0.372
Option B:	0.6030
Option C:	0.574
Option D:	-0.493
14.	The equations of the two regression lines are $x + 6y = 6$ & $3x + 2y = 10$. Find the correlation coefficient r.
Option A:	$\frac{1}{3}$
Option B:	$\frac{2}{3}$
Option C:	$-\frac{1}{3}$

Option D:	$-\frac{2}{3}$
15.	A connected planar graph has 9 vertices having vertices 2, 2, 2, 3, 3, 3, 4, 4 and 5. How many edges are there in the graph?
Option A:	12
Option B:	13
Option C:	14
Option D:	15
16.	A tree T has $2n$ vertices of degree 1, $3n$ vertices of degree 2 and n vertices of degree 3. Determine the number of vertices in the tree T.
Option A:	8
Option B:	10
Option C:	12
Option D:	14
17.	Given that G be the set of real numbers is a Group under operation $a * b = a + b - 2$. Find the identity element of the group.
Option A:	0
Option B:	1
Option C:	-2
Option D:	2
18.	Given that $A = \{1, 2, 3, 4, 5, 6\}$ is a finite abelian group under multiplication modulo 7. Find $(5)^{-1}$ under multiplication modulo 7.
Option A:	2
Option B:	3
Option C:	5
Option D:	6
19.	Given that $A = \{1, 2, 5, 7, 10, 14, 35, 70\}$ is a lattice under the relation divisibility. Find $5 \wedge 14$.
Option A:	5
Option B:	10
Option C:	14
Option D:	1
20.	Given that $L = \{2, 6, 8, 12, 24\}$ is a Lattice under the relation divisibility. Find complement of the element 6.
Option A:	8
Option B:	2

Option C:	12
Option D:	24

Q2	Solve any Four out of Six 5 marks each
A	Find all integral solutions of the Diophantine Equation $51x + 111y = 6$ by using Euclidean Algorithm.
B	Solve the following simultaneous congruences $x \equiv 1(mod\ 5), \quad x \equiv 2(mod\ 6), \quad x \equiv 3(mod\ 7)$
C	The probability that a bomb dropped from a plane will strike the target is 1/5. If 6 such bombs are dropped, find the probability that (i) exactly two bombs hit the target (ii) at least two bombs will hit the target
D	Can it be concluded that the average life span of an Indian is more than 70 years, if a random sample of 100 Indians has an average life span of 71.8 years with standard deviation of 8.9 years?
E	A tree T has some vertices of degree one, two vertices of degree two, three vertices of degree four and four vertices of degree three. Find the number of vertices of degree one in the tree.
F	Prove that $A = \{1, 3, 5, 15, 30, 60, 90, 180\}$ is Lattice under the relation divisibility.

Q3	Solve any Four out of Six 5 marks each
A	Prove that 7 divides $111^{333} + 333^{111}$
B	Find value of Jacobi's symbol $\left(\frac{2657}{9897}\right)$
C	In an intelligence test administered to 1000 students, the average was 42 and standard deviation was 24. Find the number of students (i) exceeding the score 50 and (ii) between 30 and 54.
D	Calculate Spearman's coefficient of rank correlation from the following data. X: 10, 12, 18, 18, 15, 40 Y: 12, 18, 25, 25, 50, 25
E	Prove that $A = \{0, 1, 2, 3, 4, 5\}$ is a finite abelian group under addition modulo 6.
F	Prove that $L = \{1,\ 2,\ 3,\ 6\}$ is a complemented Lattice under the relation divisibility.

Course Code: ITC401 and Course Name: Applied Mathematics-IV

Answer Key

Question Number	**Correct Option (Enter either 'A' or 'B' or 'C' or 'D')**
Q1.	D
Q2.	C
Q3.	D
Q4	B
Q5	C
Q6	C
Q7	A
Q8.	A
Q9.	A
Q10.	B
Q11.	B
Q12.	B
Q13.	B
Q14.	C
Q15.	C
Q16.	C
Q17.	D
Q18.	B
Q19.	D
Q20.	A

University of Mumbai
Examination June 2021

Examinations Commencing from 1st June 2021

Program: **Information Technology**

Curriculum Scheme: **Rev2016**

Examination: BE Semester IV

Course Code: **ITC403** and Course Name: **OPERATING SYSTEM**

Time: 2 hour Max. Marks: 80

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	In a programmed input/output(PIO) _____
Option A:	the CPU uses polling to watch the control bit constantly, looping to see if a device is ready
Option B:	the CPU writes one data byte to the data register and sets a bit in control register to show that a byte is available
Option C:	the CPU receives an interrupt when the device is ready for the next byte
Option D:	the CPU runs a user written code and does accordingly
2.	Two processes often require data to be transferred between them. The major activities of an operating system with respect to?
Option A:	Error handling
Option B:	Resource Management
Option C:	Protection
Option D:	Communication
3.	Which one of the following is not an attack, but a search for vulnerabilities to attack?
Option A:	denial of service
Option B:	port scanning
Option C:	memory access violation

Option D:	dumpster diving
4.	What is the mounting of file system?
Option A:	crating of a filesystem
Option B:	deleting a filesystem
Option C:	attaching portion of the file system into a directory structure
Option D:	removing the portion of the file system into a directory structure
5.	The time taken for the desired sector to rotate to the disk head is called _____
Option A:	positioning time
Option B:	random access time
Option C:	seek time
Option D:	rotational latency
6.	RAID stands for _____
Option A:	Redundant Allocation of Inexpensive Disks
Option B:	Redundant Array of Important Disks
Option C:	Redundant Allocation of Independent Disks
Option D:	Redundant Array of Independent Disks
7.	A server crash and recovery will _____ to a client.
Option A:	be visible
Option B:	Affect
Option C:	be invisible
Option D:	Harm
8.	Memory management technique in which system stores and retrieves data from secondary storage for use in main memory is called?
Option A:	Fragmentation

Option B:	Paging
Option C:	Mapping
Option D:	Segmentation
9.	The operating system and the other processes are protected from being modified by an already running process because _____
Option A:	they are in different memory spaces
Option B:	they are in different logical addresses
Option C:	they have a protection algorithm
Option D:	every address generated by the CPU is being checked against the relocation and limit registers
10.	The _____ is used as an index into the page table.
Option A:	frame bit
Option B:	page number
Option C:	page offset
Option D:	frame offset
11.	Each entry in a translation lookaside buffer (TLB) consists of _____
Option A:	Key
Option B:	Value
Option C:	bit value
Option D:	Constant
12.	A multilevel page table is preferred in comparison to a single level page table for translating virtual address to physical address because _____
Option A:	it reduces the memory access time to read or write a memory location
Option B:	it helps to reduce the size of page table needed to implement the virtual address space of a process
Option C:	it is required by the translation lookaside buffer
Option D:	it helps to reduce the number of page faults in page replacement algorithms

13.	Which technique is based on compile-time program transformation for accessing remote data in a distributed-memory parallel system?
Option A:	cache coherence scheme
Option B:	computation migration
Option C:	remote procedure call
Option D:	message passing
14.	Implementation of a stateless file server must not follow?
Option A:	Idempotency requirement
Option B:	Encryption of keys
Option C:	File locking mechanism
Option D:	Cache consistency
15.	A semaphore S is an integer variable that, apart from initialization, is accessed only through two standard atomic operations:
Option A:	Exec() & exit()
Option B:	Exec() & signal()
Option C:	Wait() & signal()
Option D:	Wait() & exit()
16.	After fork() system call, one of the two processes typically uses the _____ system call to replace the process's memory space with a new program.
Option A:	Exit
Option B:	Init
Option C:	Wait
Option D:	Exec
17.	Copying a process from memory to disk to allow space for other processes is called
Option A:	Swapping

Option B:	Deadlock
Option C:	Demand paging
Option D:	Page fault
18.	For long-term scheduler which of the following stand TRUE i. The long term scheduler executes much less frequently. ii. Because of the longer interval between executions, the long-term scheduler can afford to take more time to decide which process should be selected for execution. iii. Because of the smaller interval between executions, the long-term scheduler can afford to take less time to decide which process should be selected for execution. iv. The long-term scheduler executes more frequently.
Option A:	i, ii only
Option B:	i only
Option C:	i & iv only
Option D:	i, Ii & iii only
19.	Kernel threads
Option A:	Cannot be supported & managed directly by the OS.
Option B:	Can be supported & managed directly by the OS.
Option C:	Are managed below the kernel & are managed without kernel support
Option D:	Are managed above the kernel & are managed with kernel support
20.	Which of the following Multithreading model maps many user-level threads to one kernel thread.
Option A:	Many to One Model
Option B:	One to Many Model
Option C:	Many to Many Model
Option D:	One to One Model

Q2	**Solve any Two Questions out of Three**	**10 marks each**

A	What are the major activities of an operating system with regards to file management and memory management?
B	What is paging? How it is different from segmentation? Explain Hardware support for paging.
C	Explain methods for deadlock handling.

Q3.	**Solve any Two Questions out of Three** **10 marks each**
A	Explain RAID Level in Details
B	Compare Sate full Server v/s Stateless Server with a proper example.
C	Consider the following set of processes, with the length of CPU burst given in mili seconds. The processes are assumed to have arrived order P1, P2, P3. Calculate the average turnaround time and average waiting time for FCFS & SJF algorithm. Also draw Gantt Chart.

PROCESS	BURST TIME	ARRIVAL TIME
P1	15	0
P2	5	0
P3	13	0

Course Code: **ITC403** and Course Name: **OPERATING SYSTEM**

Answer Ke

Question Number	**Correct Option (Enter either 'A' or 'B' or 'C' or 'D')**
Q1.	A
Q2.	D
Q3.	B
Q4	C
Q5	D
Q6	D
Q7	C
Q8.	B
Q9.	D
Q10.	B
Q11.	A
Q12.	B
Q13.	B
Q14.	B
Q15.	C
Q16.	D
Q17.	A
Q18.	A
Q19.	A
Q20.	A