

University of Mumbai
Examination 2020 under cluster _7_ (Lead College: SSJCOE)

Examinations Commencing from 23rd December 2020 to 6th January 2021 and from 7th January
2021 to 20th January 2021

Program: BE Information Technology

Curriculum Scheme: Rev.2016

Examination: TE Semester: V

Course Code: ITC501 and Course Name: Microcontroller & Embedded Programming

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 real time operating system Select one |
| Option A: | all processes have the same priority |
| Option B: | a task must be serviced by its deadline period |
| Option C: | process scheduling can be done only once |
| Option D: | kernel is not required |
| 2. | The RS pin acts as an |
| Option A: | input pin |
| Option B: | output pin |
| Option C: | any of the mentioned depending on the conditions |
| Option D: | input & output pin |
| 3. | ASIC stands for |
| Option A: | Application-System Integrated Circuits |
| Option B: | Application-Specific Integrated Circuits |
| Option C: | Application-System Internal Circuits |
| Option D: | Application-Specific Inverter Circuits |
| 4. | Which is the microcontroller used in Arduino UNO? |
| Option A: | ATmega328p |
| Option B: | ATmega2560 |
| Option C: | ATmega32114 |
| Option D: | AT91SAM3x8E |
| 5. | How many bytes of bit addressable memory is present in 8051 based microcontrollers? |
| Option A: | 8 bytes |
| Option B: | 32 bytes |
| Option C: | 6 bytes |
| Option D: | 16 bytes |
| 6. | CPSR stands for_____. |
| Option A: | Current Program Status Register |
| Option B: | Code Program Stack Register |

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| Option C: | Code Process Status Register |
| Option D: | Current Program Stack Register |
| | |
| 7. | Which is not a core of an Embdded System |
| Option A: | Microprocessor |
| Option B: | Programmable Logic Devices |
| Option C: | Application specific integrated system |
| Option D: | Software |
| | |
| 8. | which of the following is not an Exception type of ARM7? |
| Option A: | IRQ |
| Option B: | FIQ |
| Option C: | SRQ |
| Option D: | Data Abort |
| | |
| 9. | The BSR mode of 8255 is used to |
| Option A: | set individual ports |
| Option B: | reset individual ports |
| Option C: | Program individual port as an I/O port. |
| Option D: | set and reset individual port C pin |
| | |
| 10. | MOV A, @ R1 will |
| Option A: | copy the contents of memory whose address is in R1 to the accumulator |
| Option B: | copy the accumulator to R1 |
| Option C: | copy the accumulator to the contents of memory whose address is in R1 |
| Option D: | copy R1 to the accumulator |
| | |
| 11. | In RTOS Message, mailbox and queue is used for _____ |
| Option A: | Memory Management |
| Option B: | Inter task communication |
| Option C: | Interrupt handling. |
| Option D: | Task scheduling |
| | |
| 12. | How many registers are there in ARM7? |
| Option A: | 35 register(28 GPR and 7 SPR) |
| Option B: | 37 registers(28 GPR and 9 SPR) |
| Option C: | 37 registers(31 GPR and 6 SPR) |
| Option D: | 35 register(30 GPR and 5 SPR) |
| | |
| 13. | RISC stands for _____ |
| Option A: | Restricted Instruction Sequencing Computer |
| Option B: | Restricted Instruction Sequential Compiler |
| Option C: | Reduced Instruction Set Computer |
| Option D: | Reduced Induction Set Computer |
| | |
| 14. | In Mode ____ the timers of 8051 operates as 13-counters. |
| Option A: | 2 |
| Option B: | 3 |

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| Option C: | 1 |
| Option D: | 0 |
| | |
| 15. | Which is not the state of the process ? |
| Option A: | Blocked |
| Option B: | Running |
| Option C: | Ready |
| Option D: | Privileged |
| | |
| 16. | Select the interrupt with the lowest priority |
| Option A: | External interrupt 0 (IE0) |
| Option B: | Serial port Interrupt(RI or TI) |
| Option C: | Timer interrupt 0 (TF0) |
| Option D: | External interrupt 1 (IE1) |
| | |
| 17. | Arduino IDE consists of 2 functions. What are they? |
| Option A: | Build() and loop() |
| Option B: | Setup() and build() |
| Option C: | Setup() and loop() |
| Option D: | Loop() and build() and setup() |
| | |
| 18. | Which bits of the PSW need to be programmed to select Register bank |
| Option A: | 3,4 |
| Option B: | 4,5 |
| Option C: | 2,3 |
| Option D: | 5,6 |
| | |
| 19. | What is the data processing size of ARM7 ? |
| Option A: | 8-bit |
| Option B: | 16-bit |
| Option C: | 24-bit |
| Option D: | 32-bit |
| | |
| 20. | Binary semaphore is also known as _____. |
| Option A: | Mutex |
| Option B: | Cluster |
| Option C: | Schedular |
| Option D: | Spooling |
| | |
| Q2. | A Solve any Two 5 marks each |
| i. | What are the design metrics of an embedded systems |
| ii. | Draw & explain interfacing of ADC to 8051 |
| iii. | Write short note on Real Time Operating System |
| | |
| | B Solve any One 10 marks each |
| i. | Draw & explain architecture of 8051 in detail |
| ii. | Explain different addressing modes of ARM7 with example |
| | |
| Q3. | A Solve any Two 5 marks each |
| i. | Discuss the major application areas of an Embedded System |
| ii. | Explain PSW Register of 8051 in detail |

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| iii. | Draw & explain interfacing of 8255 to 8051 |
| | |
| B | Solve any One 10 marks each |
| i. | Draw & explain interrupt structure of 8051 in detail |
| ii. | Discuss the various operating modes of ARM7 processor |

University of Mumbai
Examination 2020 under cluster 7 (Lead College: SCSJCE)
Examinations Commencing from 7th January 2021 to 20th January 2021
Program: Information Technology
Curriculum Scheme: Rev 2016
Examination: TE Semester V
Course Code: ITC502 and Course Name: Internet Programming

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. | focus event occurs when |
| Option A: | The event occurs when an element gets focus |
| Option B: | The page has loaded |
| Option C: | Input fields are changed |
| Option D: | The user clicks on an element |
| 2. | Which element is used in the <HEAD> section on an HTML / XHTMLpage, if we want to use an external style sheet file to decorate the page ? |
| Option A: | <src> |
| Option B: | <link> |
| Option C: | <style> |
| Option D: | <css> |
| 3. | If we want to wrap a block of text around an image, which css property will we use ? |
| Option A: | wrap |
| Option B: | push |
| Option C: | float |
| Option D: | align |
| 4. | var fruits = ["apple", "orange", "mango"]; is syntax for |
| Option A: | Array object |
| Option B: | Array |
| Option C: | object |
| Option D: | Object Array |
| 5. | Which of the following Viewport Property sets the initial scaling factor? |
| Option A: | scale |
| Option B: | initial-scale |
| Option C: | minimum-scale |
| Option D: | user-scale |
| 6. | What module introduces the ability to modify CSS property values over time, such as position or color, to create animated layouts? |
| Option A: | 3D Transforms |
| Option B: | Animations |
| Option C: | 2D Transforms |

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| Option D: | Box Model |
| 7. | Which feature lets you create your own vocabularies beyond HTML5 and extend your web pages with custom semantics? |
| Option A: | Geolocation |
| Option B: | Canvas |
| Option C: | Microdata |
| Option D: | WebSocket |
| 8. | What is the replacement for cookies in HTML5? |
| Option A: | Web beacons |
| Option B: | Java scripts |
| Option C: | Local Storage |
| Option D: | Audio tag |
| 9. | Which of these is a benefit JSON has over XML? |
| Option A: | JSON is more forgiving of poor formatting |
| Option B: | JSON has less markup requirements and therefore is lighter than XML |
| Option C: | JSON can be written poorly and still be parsed |
| Option D: | JSON does not need to be stored in a file to be sent remotely |
| 10. | Which methods are used to send a request to a server? |
| Option A: | open() and send() |
| Option B: | open() and close() |
| Option C: | send() and back() |
| Option D: | send() and close() |
| 11. | Following mashup use the user's web browser to combine and reformat the data. |
| Option A: | Web-based mashups |
| Option B: | Server-based mashups |
| Option C: | Ajax mashup |
| Option D: | JSON mashup |
| 12. | JSON elements are separated by |
| Option A: | semi-colon |
| Option B: | line break |
| Option C: | comma |
| Option D: | white space |
| 13. | What is the Django command to view a database schema of an existing (or legacy) database. |
| Option A: | manage.py inspectdb |
| Option B: | manage.py legacydb |
| Option C: | django-admin.py schemadump |
| Option D: | manage.py inspect |
| 14. | Which architectural pattern does Django follow |
| Option A: | Model-View-Template |
| Option B: | Modified- View- Text |
| Option C: | Mode-Value-Template |

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| Option D: | Model-View-Task |
| 15. | Which of the following function returns the number of characters in a string variable? |
| Option A: | strlen(\$variable) |
| Option B: | count(\$variable) |
| Option C: | len(\$variable) |
| Option D: | strcount(\$variable) |
| 16. | Which one of the following statements instantiates or create the mysqli class? |
| Option A: | mysqli = new mysqli() |
| Option B: | \$mysqli->new(mysqli) |
| Option C: | \$mysqli = new mysqli() |
| Option D: | mysqli->new(mysqli) |
| 17. | What will be the output of the following PHP code? <pre><?php \$str = "Internet Programming"; echo wordwrap(\$str,5,"\n"); ?></pre> |
| Option A: | Internet |
| Option B: | Programming |
| Option C: | Internet Programming |
| Option D: | Inter |
| 18. | Which of the following role of web service architecture implements the service and makes it available on the Internet? |
| Option A: | Service Provider |
| Option B: | Service Requestor |
| Option C: | Service Registry |
| Option D: | Service Distributed |
| 19. | Which of the following represents the registry of the web services? |
| Option A: | UDDI |
| Option B: | WSDL |
| Option C: | RPC |
| Option D: | RMI |
| 20. | Which of the following XML documents are well-formed. |
| Option A: | <pre><firstElement>some text goes here <secondElement>another text goes here</secondElement> </firstElement></pre> |
| Option B: | <pre><firstElement>some text goes here</firstElement> <secondElement> another text goes here</secondElement></pre> |
| Option C: | <pre><firstElement>some text goes here <secondElement> another text goes here</firstElement> </secondElement></pre> |
| Option D: | <pre></firstElement>some text goes here </secondElement>another text goes here <firstElement></pre> |

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| Q2 | |
| A | Solve any Two 5 marks each |
| i. | Differentiate GET and POST method. |
| ii. | Write about different methods for implementing cascading style sheets? |
| iii. | What do you mean by JSON? Why use JSON over XML? |
| B | Solve any One 10 marks each |
| i. | Explain how session management is done in PHP. Explain how to create, access, modify session variables in PHP? |
| ii. | Explain XML and XSL with example? |

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| Q3. | |
| A | Solve any Two 5 marks each |
| i. | Explain the features of Django Framework? |
| ii. | Explain DTD with example? |
| iii. | Write a PHP program to set the cookie and access the cookie? |
| B | Solve any One 10 marks each |
| i. | Explain in detail RUI implementation using AJAX with diagram? |
| ii. | Write code to process online Alumni information for your college. Create forms to get name, address, date of birth, and email id. Use check boxes for taking hobbies and radio buttons for selecting branch. Write JavaScript code to validate the following: <ul style="list-style-type: none"> i. User has filled all the fields prior to form submission ii. Valid email-id (with '@' and '.') iii. Age validation using DOB (>=22 years) |

University of Mumbai

Examination 2020 under cluster 7 (Lead College: _____)

Examinations Commencing from 7th January 2021 to 20th January 2021

Program: Information Technology

Curriculum Scheme: Rev2016

Examination: TE Semester V

Course Code: ITC503 and Course Name: Advanced Data Management Technology

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. | Which one of the following is not the types of entries in log records |
| Option A: | read |
| Option B: | write |
| Option C: | start |
| Option D: | end |
| 2. | The operation of moving from coarser-granularity data to finer-granularity data is called as |
| Option A: | rollup |
| Option B: | drill down |
| Option C: | slicing |
| Option D: | dicing |
| 3. | ETL represents following activities |
| Option A: | Extract, Transform and Load |
| Option B: | Eject, Transform and Load |
| Option C: | Extract, Transaction and Lock |
| Option D: | Explain, Transaction and Lock |
| 4. | Which algorithm uses equality comparison on a key attribute with a primary index to retrieve a single record that satisfies the corresponding equality condition. |
| Option A: | Primary index equality on non key attribute |
| Option B: | Primary index equality on key attribute |
| Option C: | secondary index equality on non key attribute |
| Option D: | secondary index equality on key attribute |
| 5. | Which of the following is NOT a valid access control mechanism? |
| Option A: | Discretionary Access Control. |
| Option B: | Subjective Access Control. |
| Option C: | Mandatory Access Control. |
| Option D: | Role Based Access Control. |
| 6. | Transactions T1 and T2 concurrently perform some operations on the same data item and at least one of them is write operation then these transaction known as |
| Option A: | Non Conflicting |
| Option B: | Conflicting |

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| Option C: | Overwriting |
| Option D: | Serializability |
| 7. | _____ is an example of deferred data extract |
| Option A: | data capture when transaction occurs in source database |
| Option B: | real-time data capture |
| Option C: | data capture based on date |
| Option D: | data capture through triggers |
| 8. | The total ordering of operations across groups ensuresof transactions. |
| Option A: | Serializability |
| Option B: | Synchronization |
| Option C: | Atomicity |
| Option D: | Durability |
| 9. | The write timestamp of item X is the timestamp of |
| Option A: | youngest transaction that has written X successfully |
| Option B: | oldest transaction that has written X successfully |
| Option C: | First transaction that has entered the concurrent execution |
| Option D: | Last transaction that has entered the concurrent execution |
| 10. | By ' <i>spatial data</i> ' we mean data that has |
| Option A: | The values which are Complex |
| Option B: | The values which are Positional |
| Option C: | The values which are Graphic |
| Option D: | The values which are Decimal |
| 11. | _____ may be a good solution for situations in which small to medium sized databases are the norm and application software speed is critical. |
| Option A: | OLAP |
| Option B: | ROLAP |
| Option C: | MOLAP |
| Option D: | Relational Databases |
| 12. | Different types of time available in the Temporal database. |
| Option A: | Valid and Transaction Time |
| Option B: | Transaction and Bi-Tempoal Time |
| Option C: | Valid and Bi-Temporal Time |
| Option D: | Valid, Transaction as well as Bi-Temporal Time |
| 13. | One transaction updates a database item and then the transaction fails for some reason . Meanwhile, the updated item is accessed (read) by another transaction before it is changed back to its original value . This is called as |
| Option A: | Lost update problem |
| Option B: | Temporary update problem |
| Option C: | Permanent update problem |
| Option D: | Incorrect summary problem |
| 14. | The process of returning cleaned data to the source is called as |
| Option A: | Data Purging |

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| Option B: | Backflushing |
| Option C: | Data Refresh |
| Option D: | Data Projection |
| | |
| 15. | What are the advantages of Replication of data in Distributed database? |
| Option A: | Availability, Parallelism, Increased data transfer |
| Option B: | Availability, Parallelism, Reduced data transfer |
| Option C: | Availability, Increased parallelism and Cost of updates |
| Option D: | Availability, Increased data transfer, Cost of updates |
| | |
| 16. | Which one of the following is not a disadvantages of Fragmentation are as follows |
| Option A: | When data from different fragments are required, the access speeds may be very high. |
| Option B: | In case of recursive fragmentations, the job of reconstruction will need expensive techniques. |
| Option C: | Lack of back-up copies of data in different sites may render the database ineffective in case of failure of a site. |
| Option D: | The end user is able to access any available copy of the data, and an end user's request is processed by any processor at the data location. |
| | |
| 17. | One of the main heuristic rule in query optimization is |
| Option A: | Apply SELECT operation at the earliest. |
| Option B: | Apply PROJECT operation at the earliest. |
| Option C: | Apply SELECT and PROJECT operation at the earliest. |
| Option D: | Apply SELECT and PROJECT operations before applying the JOIN operation at the earliest |
| | |
| 18. | Which of the following is true concerning a global transaction? |
| Option A: | The required data are at one local site and the distributed DBMS routes request as necessary |
| Option B: | The required data are located in at least one nonlocal site and the distributed DBMS routes request as necessary. |
| Option C: | The required data are at one local site and the distributed DBMS passes the request to only the local DBMS |
| Option D: | The required data are located in at least one nonlocal site and the distributed DBMS passes the request to only the local DBMS |
| | |
| 19. | ER modeling is suitable for |
| Option A: | Data warehouse systems |
| Option B: | OLAP systems |
| Option C: | OLTP systems |
| Option D: | Any type of Data System |
| | |
| 20. | Drawbacks of DAC are as below except |
| Option A: | Low level of data protection |
| Option B: | Obscure |
| Option C: | Vulnerable to malicious attacks, |
| Option D: | User Friendly |

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| Q2 | Solve any Four out of Six | 5 marks each |
| A | Differentiate between data warehouse and data mart | |
| B | Explain recoverable , strict schedule with example | |
| C | Explain Replication in detail. | |
| D | Explain data transformation with example. | |
| E | Explain Nested Loop Join algorithm | |
| F | List out characteristics of Temporal Database | |

Option 2

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| Q3. | Solve any Two Questions out of Three | 10 marks each |
| A | Describe ARIES recovery algorithm in detail | |
| B | Difference between Mandatory Access control and Discretionary access control also explain Access control list and access control list with respect to same. | |
| C | Explain Distributed Database architecture in detail? | |

University of Mumbai
Examination 2021 under cluster 7 (Lead College:SSJCOE)
Examinations Commencing from 7th January 2021 to 20th January 2021
Program: BE(IT) Engineering
Curriculum Scheme: Rev 2016
Examination: TE Semester V

Course Code: ITC 504 and Course Name: Cryptography and network security
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 _____ cipher reorders the plaintext characters to create a ciphertext. |
| Option A: | Substitution |
| Option B: | Transposition |
| Option C: | RSA |
| Option D: | Diffie-Hellman |
| 2. | In security CIA stands for--- |
| Option A: | Confidentiality, Integrity, Availability |
| Option B: | Central Intelligence Agency |
| Option C: | Cybersecurity Investigation Agency |
| Option D: | Cybersecurity, Internet, Accessibility |
| 3. | Ramesh opens his fitness tracking app to start logging a workout. The app crashes, and he is unable to log his workout. Which part of CIA is broken? |
| Option A: | Confidentiality |
| Option B: | Integrity |
| Option C: | Availability |
| Option D: | Accountability |
| 4. | To hide information inside a picture, what technology is used? |
| Option A: | Cryptography |
| Option B: | Steganography |
| Option C: | Image rendering |
| Option D: | Bit mapping |
| 5. | Diffie-Hellman is _ |
| Option A: | Encryption algorithm |
| Option B: | Decryption algorithm |
| Option C: | Key-Exchange Algorithm |
| Option D: | Substitution cipher |
| 6. | AES uses a _____ bit block size and a key size of _____ bits. |
| Option A: | 128; 128 or 256 |
| Option B: | 64; 128 or 192 |
| Option C: | 256; 128, 192, or 256 |
| Option D: | 128; 128, 192, or 256 |

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| 7. | Formula for cipher text using RSA algorithm is_ where c= ciphertext, p=plaintext, e= encryption key, n= block size, d=decryption key |
| Option A: | $P=C^e \text{ mod } n$ |
| Option B: | $C=P^e \text{ mod } n$ |
| Option C: | $C=P^d \text{ mod } n$ |
| Option D: | $P=C^d \text{ mod } n$ |
| 8. | Which of the following is true for the RC5 algorithm? i) Has variable number of rounds ii) Has fixed Key length iii) High memory Requirements iv) Uses only primitive computational operations commonly found on microprocessors |
| Option A: | (i) and (iv) |
| Option B: | (i)(ii) and (iv) |
| Option C: | (i) iv) |
| Option D: | (i) (ii) and (iii) |
| 9. | It is an electronic file that is used to identify people and resources over a insecure channel or internet. |
| Option A: | Digital certificate |
| Option B: | Digital signature |
| Option C: | Public key infrastructure |
| Option D: | Public key certificate |
| 10. | What do you call the process in which a user is identified via a username and password |
| Option A: | Authentication |
| Option B: | Authorization |
| Option C: | Accounting |
| Option D: | Auditing |
| 11. | What is the value of ipad in the HMAC structure? |
| Option A: | 00110010 |
| Option B: | 00111110 |
| Option C: | 10110110 |
| Option D: | 01110110 |
| 12. | The DSS signature uses which hash algorithm? |
| Option A: | SHA-1 |
| Option B: | DES |
| Option C: | MD5 |
| Option D: | AES |
| 13. | Needham- Schroder protocol uses ____ |
| Option A: | A secrete key known to sender and authentication server |
| Option B: | A secrete key known to receiver and authentication server |
| Option C: | A secrete key and public key |
| Option D: | Digital signature |
| 14. | It is the basic tool for observing the messages exchanged between executing |

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| | protocol entities. |
| Option A: | Packet analyser |
| Option B: | Packet filter |
| Option C: | Packet network |
| Option D: | Packet sniffer |
| | |
| 15. | This type of attack takes place when the attacker is on the same subnet whose target is to see the sequence and acknowledgement of the packets. |
| Option A: | Blind spoofing |
| Option B: | Man-In-middle attack |
| Option C: | Non blind spoofing |
| Option D: | Denial of service attack |
| | |
| 16. | It is the system that associates domain names with IP addresses |
| Option A: | IP spoofing |
| Option B: | ARP spoofing |
| Option C: | DNS spoofing |
| Option D: | IP sniffing |
| | |
| 17. | In this kind of attack a smurf program is used to make network inoperable. Usually IP address broadcasting is done. |
| Option A: | UDP attack |
| Option B: | ICMP attack |
| Option C: | Passive attack |
| Option D: | DNS attack |
| | |
| 18. | It is barrier place between inside and outside network to protect organization from inside and outside hackers. |
| Option A: | Gateways |
| Option B: | Firewall |
| Option C: | Intrusion detection system |
| Option D: | Switches |
| | |
| 19. | After the encryption stage in SSL, the maximum length of each fragment is |
| Option A: | $2^{14}+1028$ |
| Option B: | $2^{14}+2048$ |
| Option C: | $2^{16}+1028$ |
| Option D: | $2^{16}+2048$ |
| | |
| 20. | In _____, the cryptographic algorithms and secrets are sent with the message. |
| Option A: | IPsec |
| Option B: | PGP |
| Option C: | SSL |
| Option D: | TLS |

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| Q2 | |
| A | Solve any Two 5 marks each |
| i. | <i>Explain playfair cipher with the help of example.</i> |
| ii. | <i>Explain DNS spoofing with example</i> |
| iii. | <i>Write short note on MD5.</i> |
| B | Solve any One 10 marks each |
| i. | <i>Explain DES algorithm in detail.</i> |
| ii. | <i>What is PKI? Explain the architecture and components of PKI in detail</i> |

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| Q3. | |
| A | Solve any Two 5 marks each |
| i. | <i>Compare between steganography and cryptography.</i> |
| ii. | <i>Explain Needham Schroeder protocol</i> |
| iii. | <i>What is asymmetric key cryptography ? Discuss RSA algorithm</i> |
| B | Solve any One 10 marks each |
| i. | <i>Why there is need of firewall? Explain different types of firewalls and the limitations of firewall</i> |
| ii. | <i>Explain Kerberos protocol in detail.</i> |

University of Mumbai
Examination 2020 under cluster 7 (Lead College: SCSJCE)

Program: Information Technology
Curriculum Scheme: Rev2016
Examination: TE Semester V

Course Code: ITDLO5011 and Course Name: Advanced Data Structures & Analysis of Algorithms
Time: 2 hour Max. Marks: 80

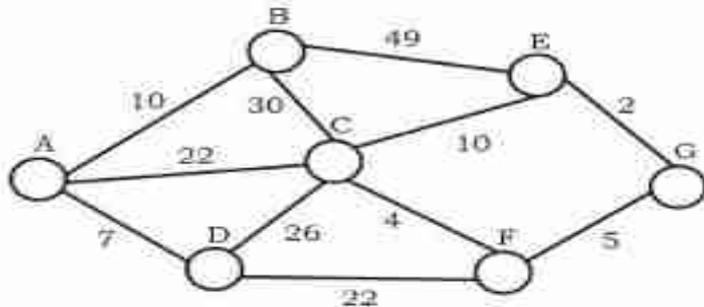
| | |
|------------|--|
| Q1. | Choose the correct option for following questions. All the Questions are compulsory and carry equal marks |
| 1. | Which one of the following is Substitution method |
| Option A: | Forward |
| Option B: | Linked list |
| Option C: | Master's |
| Option D: | Stack |
| 2. | Recursion is a method in which the solution of a problem depends on _____ |
| Option A: | Smaller instances of the same problem |
| Option B: | Larger instances of the same problem |
| Option C: | Larger instances of different problems |
| Option D: | Smaller instances of different problems |
| 3. | Which of the following is NOT recurrence method |
| Option A: | Substitution Method |
| Option B: | Master's Theorem |
| Option C: | Array |
| Option D: | Tree Method |
| 4. | What is probabilistic analysis for hire assistant example? |
| Option A: | $T(n)=O(n/2)$ |
| Option B: | $T(n)=O(n)$ |
| Option C: | $T(n)=O(\log n)$ |
| Option D: | $T(n)=O(1)$ |
| 5. | A _____ is a special Tree-based data structure in which the tree is a complete binary tree. |
| Option A: | Graph |
| Option B: | Heap |
| Option C: | List |
| Option D: | Stack |
| 6. | Which is not an application of Topological Sorting |
| Option A: | Ordered Statistics |
| Option B: | Finding prerequisite of a task |
| Option C: | Finding Deadlock in an Operating System |
| Option D: | Finding Cycle in a graph |

| | |
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| 7. | In which of the following graph Topological Sort can be implemented? |
| Option A: | Directed Acyclic Graphs |
| Option B: | Undirected Cyclic Graphs |
| Option C: | Directed Cyclic Graphs |
| Option D: | Undirected Acyclic Graphs |
| 8. | In most of the cases, topological sort starts from a node which has |
| Option A: | Maximum Degree |
| Option B: | Minimum Degree |
| Option C: | Any degree |
| Option D: | Zero Degree |
| 9. | Matrix A is of order 3*4 and Matrix B is of order 4*5. How many elements will be there in a matrix A*B multiplied recursively. |
| Option A: | 12 |
| Option B: | 15 |
| Option C: | 16 |
| Option D: | 20 |
| 10. | What is the worst case time complexity of merge sort? |
| Option A: | $O(n \log n)$ |
| Option B: | $O(n^2)$ |
| Option C: | $O(n^2 \log n)$ |
| Option D: | $O(n \log n^2)$ |
| 11. | Given an array arr = {45, 77, 89, 90, 94, 99,100} and key = 100; What are the mid values (corresponding array elements) generated in the first and second iterations? |
| Option A: | 90 and 99 |
| Option B: | 90 and 100 |
| Option C: | 89 and 94 |
| Option D: | 94 and 99 |
| 12. | Kruskal's algorithm is used to find |
| Option A: | Single Source Shortest Path |
| Option B: | Graph Traversal |
| Option C: | Minimum Spanning Tree |
| Option D: | All pair shortest Path |
| 13. | Which of the following is not greedy problem? |
| Option A: | Container loading |
| Option B: | Fractional Knapsack |
| Option C: | Flow Shop Scheduling |
| Option D: | Job Sequencing with deadlines |
| 14. | What is the optimal storage on tapes value when n=3, (I1, I2, I3) = (5, 10, 3)? |
| Option A: | 29 |
| Option B: | 31 |
| Option C: | 34 |
| Option D: | 43 |

| | |
|-----------|--|
| 15. | Which is not correct solution method of Flow shop scheduling problem? |
| Option A: | Branch and Bound |
| Option B: | Dynamic Programming |
| Option C: | Greedy algorithm |
| Option D: | Heuristic algorithm |
| 16. | Which of the following are the characteristics of dynamic programming approach? |
| Option A: | Overlapping sub problems |
| Option B: | Greedy approach |
| Option C: | Optimal substructure |
| Option D: | Both optimal substructure and overlapping sub problems |
| 17. | When a problem can be solved by combining optimal solutions to non-overlapping problems, the strategy is called |
| Option A: | Recursion |
| Option B: | Divide and Conquer |
| Option C: | Memorization |
| Option D: | Greedy |
| 18. | What is the time complexity of the above dynamic programming implementation of the longest common subsequence problem where length of one string is “m” and the length of the other string is “n”? |
| Option A: | $O(n)$ |
| Option B: | $O(m)$ |
| Option C: | $O(m+n)$ |
| Option D: | $O(mn)$ |
| 19. | What is the worst case running time of Rabin Karp Algorithm? |
| Option A: | $\Theta(n)$ |
| Option B: | $\Theta(n-m)$ |
| Option C: | $\Theta((n-m+1)*m)$ |
| Option D: | $\Theta(n * \log m)$ |
| 20. | Which of the following is a substring of “engineering” |
| Option A: | engg |
| Option B: | gineer |
| Option C: | ning |
| Option D: | eiee |

| Q2. (20 Marks Each) | Solve any Two Questions out of Three | 10 marks each |
|--------------------------------------|---|----------------------|
| A | Explain Probabilistic Analysis & Randomized Algorithm with the help of example. | |
| B | Sort the following numbers using Heap Sort. [25,67,56,32,12,96,82,44]. Show the contents of the array after every iteration. Also Derive time complexity for the same. | |
| C | Explain Strassen's matrix multiplication rules. Solve the following example with the help of Strassen's matrix multiplication. $A = \begin{bmatrix} 3 & 4 \\ 5 & 6 \end{bmatrix}$ $B = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ | |

| Q3. (20 Marks Each) | Solve any Two Questions out of Three | 10 marks each |
|--------------------------------------|--|----------------------|
| A | Explain Minimum Spanning Tree. Find Minimum spanning tree of the following graph using prims and kruskals algorithm. | |
| B | Explain 0/1 knapsack problem using dynamic programming approach. | |
| C | Explain Rabin Karp Algorithm with a suitable example. | |



University of Mumbai
Examination 2020 under cluster 7

Examinations Commencing from 7th January 2021 to 20th January 2021

Program: **Information Technology**

Curriculum Scheme: Rev2016

Examination: TE Semester V

Course Code: ITDLO5012 and Course Name: **Image Processing**

Time: 2 hour

Max. Marks: 80

| Q1. | Choose the correct option for following questions. All the Questions are compulsory and carry equal marks |
|------------|--|
| 1. | The image has pixel range [0 to L-1], where L represents |
| Option A: | Number of Grey levels |
| Option B: | Number of bits |
| Option C: | Maximum Grey value |
| Option D: | Minimum Grey value |
| 2. | Given an image of size M x N, M is defined as |
| Option A: | Number of columns |
| Option B: | Number of colors |
| Option C: | Number of rows |
| Option D: | Number of pixels |
| 3. | _____ is not a type of distance. |
| Option A: | Euclidean distance |
| Option B: | Checkbox distance |
| Option C: | Chessboard distance |
| Option D: | City-Block distance |
| 4. | Median filter is used to remove _____ |
| Option A: | Gaussian noise |
| Option B: | Salt and pepper noise |
| Option C: | Thermal noise |
| Option D: | Flicker noise |
| 5. | Method generating a processed image having specified histogram is called _____ |
| Option A: | Histogram enhancement |
| Option B: | Histogram normalization |
| Option C: | Histogram matching |
| Option D: | Histogram equalization |
| 6. | Ringling effect is observed in the output image when it is enhanced in frequency domain using _____ |
| Option A: | Ideal High pass filter |
| Option B: | Butterworth Low pass filter |
| Option C: | Gaussian High pass filter |
| Option D: | Ideal Low pass filter |

| | |
|-----------|---|
| 7. | Image enhancement techniques are _____ in nature. |
| Option A: | Objective |
| Option B: | Descriptive |
| Option C: | Decisive |
| Option D: | Subjective |
| 8. | Discrete Fourier Transform gives _____ present in an input image. |
| Option A: | grey levels |
| Option B: | bits |
| Option C: | frequencies |
| Option D: | pixels |
| 9. | Convolution in spatial domain becomes _____ in frequency domain. |
| Option A: | Addition |
| Option B: | Subtraction |
| Option C: | Division |
| Option D: | Multiplication |
| 10. | Homomorphic filter uses _____ operator. |
| Option A: | Log |
| Option B: | Gamma |
| Option C: | Dilation |
| Option D: | Erosion |
| 11. | The origin in a 3x3 structuring element is generally present at _____ |
| Option A: | Center |
| Option B: | Top right |
| Option C: | Bottom left |
| Option D: | Top left |
| 12. | In image compression, the technique where information ignored by the human eye is called as _____ |
| Option A: | coding redundancy |
| Option B: | spatial redundancy |
| Option C: | temporal redundancy |
| Option D: | irrelevant information |
| 13. | In _____ operation we first perform dilation followed by erosion |
| Option A: | Opening |
| Option B: | Closing |
| Option C: | Hit or Miss transformation |
| Option D: | Thinning |
| 14. | In lossy compression process, the information is _____. |
| Option A: | retained |
| Option B: | replicated |
| Option C: | separated |
| Option D: | lost |
| 15. | The 3x3 mask [-1, 2, -1; -1, 2, -1; -1, 2, -1] detects _____ line. |

| | |
|-----------|---|
| Option A: | Horizontal |
| Option B: | +45 degree |
| Option C: | Vertical |
| Option D: | -45 degree |
| | |
| 16. | The summation of element of Prewitt mask is _____ |
| Option A: | 0 |
| Option B: | 1 |
| Option C: | -1 |
| Option D: | 9 |
| | |
| 17. | In case of boundary descriptors, the angle between major axis and minor axis is _____ |
| Option A: | 0 |
| Option B: | 45 |
| Option C: | 60 |
| Option D: | 90 |
| | |
| 18. | In HSI, I is defined as _____ |
| Option A: | $R+G+B$ |
| Option B: | $(R+G+B)*3$ |
| Option C: | $(R+G+B)/3$ |
| Option D: | $R+(G+B)*3$ |
| | |
| 19. | Select the incorrect statement related to HSI: |
| Option A: | H value can be divided by 360 degree |
| Option B: | Saturation measure of purity of color |
| Option C: | Intensity is the gray level value of the color |
| Option D: | SI values are in the range of [0, 1] |
| | |
| 20. | _____ is not a performance measure in the CBIR system. |
| Option A: | Entropy |
| Option B: | F-measure |
| Option C: | Sensitivity |
| Option D: | Specificity |

| | | |
|-----------|---|----------------------|
| Q2 | Solve any Two Questions out of Three | 10 marks each |
| A | Explain with a diagram the fundamental steps in digital Image processing. | |
| B | Prove that the basis matrix for DFT is unitary. Also find the DFT of the sequence $x(n) = \{1, 2, 3, 4\}$. | |
| C | Explain with suitable example: i) Hough Transform ii) Statistical Moments | |

| | | |
|-----------|---|----------------------|
| Q3 | Solve any Two Questions out of Three | 10 marks each |
| A | Explain any three point processing techniques with example. | |
| B | Explain Opening and Closing operations with an example. | |
| C | Write short notes on: i) HSI color model ii) Digital watermarking | |

University of Mumbai

Examination 2020 under cluster __ (Lead College: _____)

Examinations Commencing from 23rd December 2020 to 6th January 2021 and from 7th January 2021 to 20th January 2021

Program: **Information Technology**

Curriculum Scheme: Rev2016

Examination: TE Sem-V

Course Code: ITDLO5013 and Course Name: E-Commerce & E-Business

Time: 2 hour

Max. Marks: 80

| Q1. | Choose the correct option for following questions. All the Questions are compulsory and carry equal marks |
|------------|---|
| 1. | _____ is often thought simply to refer to buying and selling using the Internet; people immediately think of consumer retail purchases from companies such as Amazon, Flipkart. |
| Option A: | Doing Business |
| Option B: | Data commerce (d-commerce) |
| Option C: | Electronic commerce (e-commerce) |
| Option D: | Trading Business |
| 2. | _____ is the transformation of key business processes through the use of Internet technologies |
| Option A: | e-business |
| Option B: | Business |
| Option C: | Trading |
| Option D: | Commerce |
| 3. | _____ are software such as Microsoft Internet Explorer and Mozilla Firefox which we use to access the information on the WWW that is stored on web servers |
| Option A: | HTTP |
| Option B: | Java |
| Option C: | PHP |
| Option D: | Web browsers |
| 4. | PHP is an example of _____ scripting language. |
| Option A: | in-side |
| Option B: | Browse-side |
| Option C: | client-side |
| Option D: | server-side |
| 5. | _____ is a “glue” between client and server parts of an application. |
| Option A: | System Software |
| Option B: | Package |
| Option C: | Firmware |
| Option D: | Middleware |
| 6. | _____ refers to whether the payment method is anonymous. In other |

| | |
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| | words, this is concerned with whether a third party can trace back who was involved in the payment transaction |
| Option A: | Originality |
| Option B: | Anonymity |
| Option C: | Safety |
| Option D: | Security |
| | |
| 7. | SET Protocol is _____ for credit card payment. |
| Option A: | Secure Electronic Protocol. |
| Option B: | Systematic Elective Prototype |
| Option C: | Simple Element Payment |
| Option D: | Single Entity Point |
| | |
| 8. | _____ in which sensitive messages are encrypted so that they are kept confidential. |
| Option A: | Privacy |
| Option B: | Authenticity |
| Option C: | Confidentiality |
| Option D: | Security |
| | |
| 9. | _____ is refers to a registered holder of the credit card who is a buyer |
| Option A: | Agent |
| Option B: | Seller |
| Option C: | Owner |
| Option D: | Cardholder |
| | |
| 10. | _____ models specifically describe different techniques for generation of income. |
| Option A: | Revenue |
| Option B: | Market Place |
| Option C: | Process |
| Option D: | Supply Chain |
| | |
| 11. | _____ is a Attracting visitors to a web site or promoting a brand through reaching them via search engines or advertising on other sites. |
| Option A: | Selling |
| Option B: | Marketing |
| Option C: | Customer acquisition |
| Option D: | Buying |
| | |
| 12. | _____ analysis examines current and projected customer use of each digital channel and different services within different target markets |
| Option A: | Supply |
| Option B: | Buy |
| Option C: | Sell |
| Option D: | Demand |
| | |
| 13. | The SOSTAC framework is used for _____ |
| Option A: | E-marketing planning |

| | |
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| Option B: | Purchasing Planning |
| Option C: | Selling Planning |
| Option D: | Buying Planning |
| 14. | _____ analysis for e-business is primarily concerned with its e-business capabilities, i.e. the degree to which a company has in place the appropriate technological and applications infrastructure and financial and human resources to support it. |
| Option A: | Data |
| Option B: | Resource |
| Option C: | Company |
| Option D: | Fund |
| 15. | _____ is a relatively simple yet powerful tool that can help organizations analyze their internal resources in terms of strengths and weaknesses and match them against the external environment in terms of opportunities and threats |
| Option A: | Fund Analysis |
| Option B: | SWOT analysis |
| Option C: | Data Analysis |
| Option D: | Business Analysis |
| 16. | _____ for e-businesses are a concise summary defining the scope and broad aims of digital channels in the future, explaining how they will contribute to the organization and support customers and interactions with partners. |
| Option A: | Management Document |
| Option B: | Fact sheet |
| Option C: | Review of Business |
| Option D: | Vision or mission statements |
| 17. | Value is added through providing better-quality products and services to an organization's customers is known as _____ |
| Option A: | Adding value |
| Option B: | Adding Customer |
| Option C: | Adding Client |
| Option D: | Adding money |
| 18. | _____ involves the coordination of all supply activities of an organization from its suppliers and delivery of products to its customers. |
| Option A: | Human Resource Management (HRM) |
| Option B: | Supply chain management (SCM) |
| Option C: | Customer Relationship Management (CRM) |
| Option D: | Enterprise Relationship Planning (ERP) |
| 19. | The _____ is illustrated by a manufacturer who perhaps develops an innovative product and then identifies a suitable target market. A distribution channel is then created to push the product to the market. |
| Option A: | Bull Market |
| Option B: | Pull Market |
| Option C: | Pull Model |
| Option D: | Push Model |

| | |
|-----------|---|
| 20. | The_____, which is focused on the customer’s needs and starts with analysis of their requirements through market research and close cooperation with customers and suppliers in new product development |
| Option A: | Push Model |
| Option B: | Pull model |
| Option C: | Bull Market |
| Option D: | Pull Market |

| | | |
|--------------------------------|---|----------------------|
| Q2 (20 Marks) | Solve any Two Questions out of Three | 10 marks each |
| A | <i>Explain in Detail SET Protocol for credit card payment with its network architecture</i> | |
| B | <i>List in Detail Different types of electronic marketing.</i> | |
| C | <i>Write a Detailed note on Challenges of E Business.</i> | |

| | | |
|--------------------------------|--|----------------------|
| Q3 (20 Marks) | Solve any Two Questions out of Three | 10 marks each |
| A | <i>You are assigned to a Government Health Department Project. This Project is based on Beds Availability in Covid 19 (Corona) Hospitals. Design and Develop Website for same.</i> | |
| B | <i>You are heading a project based on the Health Insurance Management System. Design and Develop Website for same.</i> | |
| C | <i>Write a Detailed note on E- Procurement.</i> | |

University of Mumbai

Examination 2020 under cluster 07

**Examinations Commencing from 23rd December 2020 to 6th January 2021 and from 7th January 2021
to 20th January 2021**

Program: Information Technology

Curriculum Scheme: Rev2016

Examination: TE Semester V

Course Code: ITDLO5014 Course Name: IT Enabled Services

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. | 3 D framework for business and IT alignment focus on |
| Option A: | Discipline, Design and Drive |
| Option B: | Data, Design, and Deployment |
| Option C: | Discipline, Design and Development |
| Option D: | Design, Data and Development |
| 2. | Which is not the framework for Business and IT alignment |
| Option A: | Communication School |
| Option B: | Architecture School |
| Option C: | Technology School |
| Option D: | Coder School |
| 3. | Perspective of Communication School is |
| Option A: | Planning |
| Option B: | Process |
| Option C: | Performance |
| Option D: | People |
| 4. | Perspective of Architecture School is |
| Option A: | Planning |
| Option B: | Process |
| Option C: | Performance |
| Option D: | People |
| 5. | Which SITP approach emphasis on understanding the current system |
| Option A: | Bottom-up evaluative approach |
| Option B: | Creative approach |
| Option C: | Top-down analytical approach |
| Option D: | Judgmental approach |
| 6. | Which SITP approach evaluates internal and external factors |
| Option A: | Bottom-up evaluative approach |
| Option B: | Creative approach |
| Option C: | Top-down analytical approach |
| Option D: | Judgmental approach |
| 7. | Which SITP approach was prominent in pre internet days |
| Option A: | Rockart's critical success factor CSF |
| Option B: | IBM business system planning BSP |
| Option C: | Porter's value chain analysis |
| Option D: | Scenario planning |

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| | |
| 8. | As per Nolan, how many stages are there in IT adoption |
| Option A: | 10 |
| Option B: | 5 |
| Option C: | 9 |
| Option D: | 6 |
| | |
| 9. | Which is component driven framework for IT technology management |
| Option A: | TOGAF |
| Option B: | TRM |
| Option C: | SIB |
| Option D: | BBIB |
| | |
| 10. | Who takes care of all the projects of the organization |
| Option A: | Program Management Office |
| Option B: | Project Management office |
| Option C: | Process management office |
| Option D: | HR department |
| | |
| 11. | Who owns incident ownership |
| Option A: | Backend team |
| Option B: | Maintenance team |
| Option C: | Service desk team |
| Option D: | Testing team |
| | |
| 12. | Which document describes the agreed service offered |
| Option A: | Service catalogue |
| Option B: | Service level agreement |
| Option C: | Operational level agreement |
| Option D: | Service level requirement |
| | |
| 13. | A formal signed agreement describing service provision |
| Option A: | Service catalogue |

| | |
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| Option B: | Service level agreement |
| Option C: | Operational level agreement |
| Option D: | Service level requirement |
| | |
| 14. | A document covering service and its specifications asked by the customer to meet its business needs |
| Option A: | Service catalogue |
| Option B: | Service level agreement |
| Option C: | Operational level agreement |
| Option D: | Service level requirement |
| | |
| 15. | A formal signed agreement defining external support requirements with external vendors |
| Option A: | Underpinning contract |
| Option B: | Service level agreement |
| Option C: | Operational level agreement |
| Option D: | Service level requirement |
| | |
| 16. | PHP command to display text on screen |
| Option A: | Put |
| Option B: | Write |
| Option C: | out |
| Option D: | echo |
| | |
| 17. | PHP stands for |
| Option A: | Higher text preprocessor |
| Option B: | Hypertext preprocessor |
| Option C: | HugeText preprocessor |
| Option D: | HeavyText preprocessor |
| | |
| 18. | PHP script is executed on |
| Option A: | Client |
| Option B: | Server |
| Option C: | Browser |
| Option D: | Mobile |
| | |
| 19. | PHP file have extension |
| Option A: | .php |

| | |
|-----------|---------------------|
| Option B: | .hph |
| Option C: | .php |
| Option D: | .pph |
| | |
| 20. | ERP integrates |
| Option A: | Functional areas |
| Option B: | Nonfunctional areas |
| Option C: | Technical areas |
| Option D: | Non-Technical areas |
| | |

University of Mumbai

Examination 2020 under cluster 07

Examinations Commencing from 23rd December 2020 to 6th January 2021 and from 7th January 2021 to 20th January 2021

Program: Information Technology

Curriculum Scheme: Rev2016

Examination: TE Semester V

Course Code: ITDLO5014 Course Name: IT Enabled Services

Time: 2 hour

Max. Marks: 80

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|--------------|---|----------------------|
| Q2. A | Solve any Two | 10 marks each |
| i. | What is IT strategy? Describe reasons for formulation of IT Strategy? | |
| ii. | Explain the term Service level agreement | |
| iii. | Explain the concepts of UDDI, WSDL and SOAP. | |

| | | |
|--------------|---|----------------------|
| Q3. A | Solve any Two | 10 marks each |
| i. | Enlist Characteristics of Business Strategy. | |
| ii. | What is ITIL? Also explain Service Support Processes of ITIL. | |
| iii. | What is insourcing, outsourcing? Explain the difference between insourcing & outsourcing. | |

University of Mumbai
 Examination 2020 under cluster 4 (PCE)
 Program: Information Technology
 Curriculum Scheme: Rev2016
 Examination: TE Semester V

Course Code: ITDLOC5015 and Course Name: Computer Graphics & Virtual Reality
 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. | Types of CRT are __ and __ |
| Option A: | Random, Raster |
| Option B: | Raster, Scalar |
| Option C: | Vector, Random |
| Option D: | Symmetric, Asymmetric |
| 2. | Video devices with reduced volume, weight and power consumption are collectively known as..... |
| Option A: | Light weight monitors |
| Option B: | Flat-panel displays |
| Option C: | CRT |
| Option D: | Portable display |
| 3. | The process of digitizing a given picture definition into a set of pixel-intensity for storage in the frame buffer is called |
| Option A: | Rasterization |
| Option B: | Encoding |
| Option C: | Scan conversion |
| Option D: | True color system |
| 4. | How scan-line polygons fill algorithm works? |
| Option A: | By intersecting polygon at even edges |
| Option B: | By intersecting scanline with polygon edges |
| Option C: | By intersecting scanline with polygon center |
| Option D: | By intersecting polygon at odd edges |
| 5. | Which neighbouring pixels are considered in 4-connected method? |
| Option A: | Left,Right,Diagonal Left,Diagonal Right |
| Option B: | Top,Bottom,Diagonal Top,Diagonal Bottom |
| Option C: | Left,Bottom |
| Option D: | Left, Right, Top, Bottom |
| 6. | What is the use of getpixel() function? |
| Option A: | Sets the color of the pixel |
| Option B: | Modifies the color of the pixel |
| Option C: | Returns the color of the pixel |
| Option D: | Changes the color of the pixel |

| | |
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| | |
| 7. | If the scaling factors values s_x and $s_y < 1$ then |
| Option A: | It reduces the size of object |
| Option B: | It increases the size of object |
| Option C: | It stunts the shape of an object |
| Option D: | It does not affect the shape of an object |
| | |
| 8. | Which clipping algorithm uses parametric equations? |
| Option A: | Cohen Sutherland clipping algorithm |
| Option B: | Sutherland Hodgeman clipping algorithm |
| Option C: | Liang Barsky clipping algorithm |
| Option D: | Midpoint clipping algorithm |
| | |
| 9. | The 4-bit code of bottom-right region of the window is _____ |
| Option A: | 1001 |
| Option B: | 0101 |
| Option C: | 1010 |
| Option D: | 0110 |
| | |
| 10. | When projection lines are perpendicular to the view plane then such type of projection is called as..... |
| Option A: | Parallel |
| Option B: | Perspective |
| Option C: | Orthographic |
| Option D: | Oblique |
| | |
| 11. | Moving a point or series of points from initial position to final position is called as..... |
| Option A: | Warping |
| Option B: | Morphing |
| Option C: | Tweening |
| Option D: | Dissolve |
| | |
| 12. | OpenGL stands for ___ |
| Option A: | Open Graphical Library |
| Option B: | Outer Graphics Library |
| Option C: | Output Graphics Library |
| Option D: | Open Graphics Library |
| | |
| 13. | A _____ is a display device, worn on head as a part of helmet that has a small display optic. |
| Option A: | HD |
| Option B: | MD |
| Option C: | HMD |
| Option D: | ARD |
| | |
| 14. | Wearable computing device in the form of computerized eyeglasses. |
| Option A: | HMD |
| Option B: | Helmets |
| Option C: | Smart Glasses |

| | |
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| Option D: | VR Glasses |
| 15. | Tracking devices are also called_____ |
| Option A: | 6-angular-of-freedom devices |
| Option B: | 6-degree-of-freedom devices |
| Option C: | 6-direction-of-freedom devices |
| Option D: | 6-views-of-freedom devices |
| 16. | _____ enables humans to interface with the machine without any mechanical devices |
| Option A: | Sign Language |
| Option B: | Commands |
| Option C: | Hand movements |
| Option D: | Gesture Recognition |
| 17. | The VR system should support the frame rate of at least _____ frame/s. |
| Option A: | 15 |
| Option B: | 10 |
| Option C: | 30 or more |
| Option D: | 20 |
| 18. | A VRML comment is a ___comment that must be on the first line of any VRML file |
| Option A: | multi-line |
| Option B: | paragraph |
| Option C: | single-line |
| Option D: | description in detail |
| 19. | _____is the earliest version of VRML |
| Option A: | VRML1.0 |
| Option B: | VRML97 |
| Option C: | X3D |
| Option D: | VRML87 |
| 20. | VGA is an acronym used for |
| Option A: | Video graphics arrangement |
| Option B: | Video graphics add-on |
| Option C: | Visual graphics array |
| Option D: | Video graphics array |

| | | |
|-----------|---|----------------------|
| Q2 | Solve any Two Questions out of Three | 10 marks each |
| A | Explain midpoint circle algo and generate a circle with radius 10 and center at origin. | |
| B | Explain different motion control methods. | |
| C | Explain Sutherland - Hodgeman polygon clipping algorithm and state its disadvantage. | |

| | | |
|------------|----------------------------------|---------------------|
| Q3. | Solve any Four out of Six | 5 marks each |
| A | Write a note on Fractals. | |

| | |
|---|---|
| B | Write a note Scan line fill algo. |
| C | Explain Key frame animation |
| D | Explain B-spline curve. |
| E | Explain various image representation techniques |
| F | Discuss the applications of Computer Graphics |