

Part – A (20 x 1 = 20 Marks). This part is Compulsory for all candidates

1.	What is the main AI/Machine Learning algorithm behind the Viola-Jones face detector, which is there in almost every mobile phone? A. AdaBoost B. SVM C. Random Forest D. CNN	[A]
2.	Which AI/Machine Learning methodology is behind Interactive Voice Response (IVR) systems? A. SVMs B. Hidden Markov Models C. CNNs D. GANs	[B]
3.	Which of the following statements about MATLAB is incorrect? A. MATLAB is an interpreter-based language B. MATLAB is a compiler-based language C. MATLAB programs can use code written in C and compiled D. MATLAB can generate library code for use in C programs	[B]
4.	Which of the following statements about MATLAB is incorrect A. MATLAB allows creation and operation of linked lists B. MATLAB allows programmers explicit use of pointers C. A linked list in MATLAB can be used with classes D. MATLAB has implementations of binary search trees	[B]
5.	Which of the following statements is incorrect? A. xournal is a open source PDF editor and OneNote-like tablet interfaces B. audacity is an open source tool for audio synthesis/modification C. OpenShot is an open source video editor D. xfig is a free drawing editor, but not open source	[D]
6.	Which of the following statements about IoT (Internet of Things) is incorrect? A. IoT for big data often relies on the basic Cyber-Physical Systems architecture B. Small Embedded boards with Rasberry Pi have revolutionized IoT devices with compute power C. IoT precludes military operations D. Edge computing involves providing compute power closer to the sensors themselves, rather than sending the data to the cloud for compute power	[C]
7.	Which of the following is not included in Industry 4.0 A. Interconnection and Information Transparency B. Technical Assistance from Cyber-Physical Systems C. De-centralized Decision Making D. Smart Homes	[D]
8.	For a basic 4-primary partition-based Linux installation, which of the following is not a usual choice for a separate partition? A. / B. /home C. swap D. /tmp	[D]

[A]	<p>9. Which of the following with respect to UEFI and MBR is incorrect?</p> <p>A. UEFI has networking features in the firmware itself B. BIOS supports Secure Boot C. The MBR cannot recover from errors all by itself as it does not have any error detection/recovery mechanism D. GPT uses a CRC check from other copies to recover from errors</p>	[B]
[B]	<p>10. Which of the following statements about partitions is incorrect?</p> <p>A. There can be at most 4 primary partitions (with an MBR) B. There can be any number of secondary (logical) partitions (with an MBR) C. If a boot flag is set for more than one partition, none of them is booted D. If more than one partition is bootable, the first bootable partition is chosen for booting, by default, if there is a time-out for a user to choose from a menu</p>	[C]
[B]	<p>11. Which of the following points about swapping is incorrect?</p> <p>A. A swap partition is fast since it involves raw data and does not have to go through the file system B. Computer systems rarely have their entire address space available as main memory, hence swapping is necessary C. A swap file is more flexible since its size can change dynamically, unlike a swap partition D. Linux activates swapping as soon as the operating system starts operations</p>	[D]
[B]	<p>12. Which of the following statements about swap areas is incorrect?</p> <p>A. Windows chooses a swap file for flexibility of its size B. Linux can work with a swap file, but this is not generally recommended C. Linux can work with a swap partition, this is usually the recommended option D. A swap partition on Windows follows the NTFS file system</p>	[D]
[D]	<p>13. Which of the following is not a valid boot loader</p> <p>A. NTLDR B. GRUB C. LILO D. MBR</p>	[D]
[C]	<p>14. For a typical Windows installation, it is advisable to keep a separate partition for data. Which one among the following, is not a valid reason for the same?</p> <p>A. CHKDSK acts only on system files, and will not act on user data in the case of a disk crash. B. OS upgrades typically wipe out the contents of the C drive C. Different Windows installations can utilize the same data partition D. The data can be logically kept separate, for an efficient backup mechanism</p>	[A]
[D]	<p>15. Which of the following statements regarding network connection hardware, is incorrect?</p> <p>A. A gateway connects two separate networks which may run different networking models B. A router is a network layer device, which connects LANs/WANs, and does the routing based on IP addresses C. A switch is typically a data link layer device D. A hub or repeater operated at the physical layer, with a routing table to route packets from one part of a network to another, as given by a routing table</p>	[D]

16.	<p>The ping utility checks for connectivity between computers on an IP network. Which of the following statements about using a ping utility is incorrect?</p> <p>A. ping measures the round-trip time between two computers on a network B. ping sends ICMP echo request packets and waits for ICMP echo reply C. TTL (Time-to-Live) limits the number of network hops D. ping requires a user to know the MAC address of the destination computer</p>	[D]
17.	<p>Which of the following points about IPv4 and IPv6 is not correct?</p> <p>A. IPv4 allows numeric addresses, while IPv6 allows alphanumeric addresses B. IPv4 field separators are dots, IPv6 separators are colons C. IPv4 uses ARP to map to MAC addresses, while IPv6 uses NDP to map to MAC addresses D. IPv4 field separators are dots, IPv6 separators are semi-colons</p>	[D]
18.	<p>On a Linux computer with a wired Ethernet port and a Wireless interface, which of the following statements is untrue?</p> <p>A. eth0 and wlan0 correspond to two separate MAC addresses when the system is not connected to any network B. eth0 and wlan0 correspond to the same MAC address when the system is not on any network C. lo does not have a MAC address D. eth0 and wlan0 correspond to two separate MAC addresses when the system is connected to a network</p>	[B]
19.	<p>Which of the following is untrue about the DHCP protocol?</p> <p>A. DHCP assigns an IP address automatically from a list of available addresses B. DHCP cannot assign addresses based on a pre-stored MAC mapping on a DHCP server C. If more than one DHCP server is present in a network, the one which communicates with a machine the quickest becomes the server, for a client D. The protocol expects the client to configure itself with the negotiated parameters from a server</p>	[B]
20.	<p>Which of the following statements about DNS is incorrect?</p> <p>A. A system administrator usually designates one or two machines as DNS servers, to translate names into IP addresses B. The names which the network's DNS cannot resolve, are carried over to the DNS of the service provider, which gives Internet services to the network C. Google's IPv4 DNS servers are 8.8.8.8 and 4.4.4.4 D. A DNS server can maintain a list of names which respond to different IP addresses at different points in time.</p>	[C]

Part – B (20 questions x 4 = 80 Marks)
Choose only one of the Sub Parts I, II and III and answer questions given it.
All Sub parts I, II and III are having equal marks

Sub Part 1:

21.	To use <i>dpkg</i> to remove a package called <i>the program</i> , including its configuration files, which of the following commands would you issue? <input checked="" type="checkbox"/> A. <i>dpkg -P theprogram</i> <input type="checkbox"/> B. <i>dpkg -p theprogram</i> <input type="checkbox"/> C. <i>dpkg -r theprogram</i> <input type="checkbox"/> D. <i>dpkg -r theprogram-1.2.3-4.deb</i>	[A]
22.	WYSIWYG - describes the display of a document on screen as it will actually print : <input type="checkbox"/> A. What you state is what you get <input type="checkbox"/> B. What you see is what you get <input type="checkbox"/> C. What you save is what you get <input type="checkbox"/> D. What you send is what you get	[B]
23.	What does MOODLE stands for <input checked="" type="checkbox"/> A. Modular Object Oriented Dynamic Learning Environment <input type="checkbox"/> B. Multimedia Object Oriented Distance Learning Environment <input type="checkbox"/> C. Malware Object Oriented Detection Learning Environment <input type="checkbox"/> D. None of the above	[A]
24.	What does comparing a known value with NULL result into? <input type="checkbox"/> A. zero <input type="checkbox"/> B. a positive value <input type="checkbox"/> C. a negative value <input checked="" type="checkbox"/> D. null	[D]
25.	For a dynamically allocated array <i>b</i> , what happens if it is not freed at the end of a program? (Which one is the only correct answer?) <input type="checkbox"/> A. The memory remains allocated, and is wasted <input type="checkbox"/> B. The terminated process has its resources taken away from it by an operating system, at its convenience. <input type="checkbox"/> C. The operating system transfers this memory from the heap space to the stack space <input type="checkbox"/> D. There is a compilation error	[B]
26.	A user tries to access the contents of a dynamically allocated array <i>b</i> after <i>b</i> has been freed with the <i>free(b)</i> command. Which one of the following is incorrect? <input type="checkbox"/> A. There will be a compilation error <input type="checkbox"/> B. If the memory chunk is no longer in the process's address space and the OS has reclaimed the resources from the process, it will give a run-time error <input type="checkbox"/> C. If the memory chunk is in the process's address space after the freeing, if this has not been over-written, this will print the original contents <input type="checkbox"/> D. If the memory chunk is in the process's address space after the freeing, it could result in junk being accesses if this has been used by another part of the process	[A]

27.	<pre>int **b, i; b = (int **) malloc(100*sizeof (int *)); for(i = 0; i <= 99; i++) *(b + i) = (int *) malloc(10 * sizeof(int));</pre> <p>The above segment of code</p> <p>A. Dynamically allocates memory for an integer array with 100 rows and 10 columns B. Statically allocates memory for an integer array with 10 rows and 100 columns C. Statically allocates memory for an integer array with 100 rows and 10 columns D. Dynamically allocates memory for an integer array with 10 rows and 100 columns</p>	[A]
28.	<p>You are given the following code segment:</p> <pre>int **b, i; b = (int **) malloc(100*sizeof (int *)); for(i = 0; i <= 99; i++) *(b + i) = (int *) malloc(10 * sizeof(int));</pre> <p>Which one of the following correctly frees the allocated memory?</p> <p>A. free(b); B. for(i = 0; i <= 9; i++) free (b); C. for(i = 0; i <= 9; i++) free (*(b+i)); free(b); D. for(i = 0; i <= 99; i++) free (b[i]); free(b);</p>	[C]
29.	<p>We want to print all 10 elements of an integer array b. Which of the following is incorrect?</p> <p>A. for (i=0;i<=10;i++) printf("%d\n",b[i]); B. for(i=0;i<10;i++) printf("%d\n",b[i]); C. for(i=0;i<=9;i++) printf("%d\n",b[i]); D. for(i=0;i<10;i=i+1) printf("%d\n",b[i]);</p>	[A]
30.	<p>Point out the wrong statement</p> <p>A. Table constraints must be used when more than one column must be included in a constraint B. A column constraint is specified as part of a column definition and applies only to that column C. A table constraint is declared independently from a column definition and can apply to more than one column in a table D. Primary keys allow for NULL as one of the unique values</p>	[D]
31.	<p>Which two statements describe the IP address 10.16.3.65/23?</p> <p>i. The subnet address is 10.16.3.0 255.255.254.0. ii. The lowest host address in the subnet is 10.16.2.1 255.255.254.0. iii. The last valid host address in the subnet is 10.16.2.254 255.255.254.0. iv. The broadcast address of the subnet is 10.16.3.255 255.255.254.0.</p> <p>A. i and iii B. ii and iv C. i, ii and iv D. ii, iii and iv</p>	[B]

32	Which multiple access technique is used by IEEE 802.11 standard for wireless LAN? A. CDMA B. CSMA/CA C. ALOHA D. CSMA/CD	[B]																
33	STP (Spanning tree protocol) is a switching protocol that prevents _____ in switching network. A. Route poisoning B. Use for network discovery C. Broadcast D. Loops	[D]																
34	In the DNS, the names are defined in _____ structure. A. a linear list B. an inverted-tree C. a graph D. none of the above	[B]																
35	Match the following and choose the correct options: <table border="1" style="margin-left: 20px;"> <tr> <td>P</td> <td>Ping</td> <td>i)</td> <td>discover the routes</td> </tr> <tr> <td>Q</td> <td>Traceroute</td> <td>ii)</td> <td>method for troubleshooting the accessibility of devices</td> </tr> <tr> <td>R</td> <td>Netstat</td> <td>iii)</td> <td>control the network connections on Windows NT/XP</td> </tr> <tr> <td>S</td> <td>ipconfig</td> <td>iv)</td> <td>finding problems in the network</td> </tr> </table> <p>A. P-iii, Q-i, R-iv, S-ii B. P-ii, Q-i, R-iv, S-iii C. P-i, Q-iii, R-ii, S-iv D. P-iv, Q-ii, R-iii., S-i</p>	P	Ping	i)	discover the routes	Q	Traceroute	ii)	method for troubleshooting the accessibility of devices	R	Netstat	iii)	control the network connections on Windows NT/XP	S	ipconfig	iv)	finding problems in the network	[B]
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36	What is the field of MAC frame that alerts receiver and enables it to synchronize? A. SFD B. preamble C. source address D. destination address	[B]																
37	The most important reason for failure of MIS is A. Use of improper tools for design B. Non Involvement of end user C. Improper specification D. None of the above	[B]																
38	Which of the following relates to enterprise interoperability? A. DFD B. Information flow diagram C. XML D. Entity relationship diagram	[C]																

39	<p>Which of the following should be used to find all the courses taught in the Fall 2009 semester but not in the Spring 2010 semester?</p> <p>A. SELECT DISTINCT course_id FROM SECTION WHERE semester = 'Fall' AND YEAR= 2009 AND course_id NOT IN (SELECT course_id FROM SECTION WHERE semester = 'Spring' AND YEAR= 2010);</p> <p>B. SELECT DISTINCT course_id FROM instructor WHERE name NOT IN ('Fall', 'Spring');</p> <p>C. SELECT course_id FROM SECTION WHERE semester = 'Spring' AND YEAR= 2010);</p> <p>D. SELECT COUNT (DISTINCT ID) FROM takes WHERE (course_id, sec_id, semester, YEAR) IN (SELECT course_id, sec_id, semester, YEAR FROM teaches WHERE teaches.ID= 10101);</p>	[A]
40	<p>Which of the following join uses maximum resources if there are large tables?</p> <p>A. Left Join</p> <p>B. Right Join</p> <p>C. Cross Join</p> <p>D. Inner Join</p>	[C]

Sub Part II:

41	<p>Which of the following statement is correct with respect to the first angle projection method?</p> <p>A. Left side view is on the left of the Front View</p> <p>B. Right side view is on the right of the front view</p> <p>C. Front view is below the reference line xy and Top view is above the Reference line xy.</p> <p>D. Front view is above the reference line xy and Top view is below the Reference line xy.</p>	[D]
42	<p>The stress level, below which a material has a high probability of not failing under reversal of stress, is known as</p> <p>A. elastic limit</p> <p>B. endurance limit</p> <p>C. proportional limit</p> <p>D. tolerance limit</p>	[B]
43	<p>If the distance between the two streamlines for an incompressible flow is reducing then the magnitude of velocity _____</p> <p>A. increases</p> <p>B. decreases</p> <p>C. slowly becomes zero</p> <p>D. none of the above</p>	[A]
44	<p>Which one of the following metal forming processes is not a high energy forming process?</p> <p>A. Electro-magnetic forming</p> <p>B. Roll forming</p> <p>C. Explosive forming</p> <p>D. Electrohydraulic forming</p>	[B]

45	<p>Cold shut is a forging defect caused by which of the following reason?</p> <p>A. improper cleaning of the stock <input checked="" type="checkbox"/> B. improper design of die C. misalignment of the two die halves D. improper cooling of the large forging</p>	[B]								
46	<p>Friction between chip and tool can be reduced by</p> <p>A. Increasing rake angle B. Increasing flank angle C. Increasing depth of cut D. Increasing cutting speed</p>	[D]								
47	<p>Cutting tool material 18-4-1 HSS has which one of the following composition</p> <p>A. 18% W, 4% Cr, 1% V B. 18% Cr, 4% W, 1% V C. 18% W, 4% V, 1% Cr D. 4)18% Cr, 4% V, 1% W</p>	[A]								
48	<p>A gating ratio of 1 : 2 : 4 is used to design the gating system for magnesium alloy casting, which refers to the cross section areas of the various gating elements as given below:</p> <p>1. Down sprue 2. Runner bar 3. Ingates</p> <p>The correct sequence of the above elements in the ratio 1 : 2: 4 is</p> <p>A. 1, 2 and 3 B. 1, 3 and 2 C. 2, 3 and 1 D. 3, 1 and 2</p>	[A]								
49	<p>A good cutting fluid should have</p> <p>A. Low thermal conductivity B. High viscosity C. High specific heat D. High density</p>	[B]								
50	<p>Match the following:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">(a) Slush casting</td> <td style="width: 50%;">(1) Turbine blades</td> </tr> <tr> <td>(b) Investment casting</td> <td>(2) Cylinder head</td> </tr> <tr> <td>(c) Pressure Die casting</td> <td>(3) Christmas tree</td> </tr> <tr> <td>(d) Shell molding</td> <td>(4) Carburetor</td> </tr> </table> <p>A. a-1, b-4, c-3, d-2 <input checked="" type="checkbox"/> B. a-3, b-1, c-4, d-2 C. a-3, b-1, c-2, d-4 D. a-1, b-3, c-4, d-2</p>	(a) Slush casting	(1) Turbine blades	(b) Investment casting	(2) Cylinder head	(c) Pressure Die casting	(3) Christmas tree	(d) Shell molding	(4) Carburetor	[B]
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51	<p>For an orthogonal cutting operation, the rake angle is 10° and the coefficient of friction is 0.5. Find the shear angle.</p> <p>A. 16.12° B. 23.17° C. 32.26° <input checked="" type="checkbox"/> D. 36.72°</p>	[D]								
52	<p>In the CNC machining, point-to-point system is used in which of the following process?</p> <p><input checked="" type="checkbox"/> A. Reaming B. Grooving C. Parting D. Facing</p>	[A]								
53	<p>A cylinder of 25 mm diameter and 100 mm long is turned with a tool, for which the relation $VT_{0.25} = 55$ is applicable. For a tool feed of 0.046 mm/rev, the number of tool regrinds required to produce 425 cylinders is</p> <p>A. 12 B. 22 C. 43 D. 4) 85</p>	[D]								
54	<p>Projection welding is</p> <p>A. Metal inert gas welding process B. Contin Continuous spot welding process C. Metal arc welding process <input checked="" type="checkbox"/> D. Multi-spot welding process</p>	[D]								

55	A grinding wheel is specified as 49 A 36 M 7 V 24 the number 36 stands for A. Structure B. Grade <input checked="" type="checkbox"/> C. Grit size D. Bond	[C]
56	Chills are used in casting moulds to <input checked="" type="checkbox"/> A. Achieve direction solidification B. Reduce possibility of blow holes C. Reduce freezing time D. Increase the smoothness of cast surface	[A]
57	A block of metal of dimensions $100 \times 100 \times 10 \text{ mm}^3$ is casted in sand moulds. If shrinkage allowance is 1% (Assume the metal contracts on cooling), the ratio of volume of pattern to that of casting will be approximately A. 0.97 B. 0.99 C. 1.01 <input checked="" type="checkbox"/> D. 1.03	[D]
58	During heat treatment of steel, the hardness of various structures in increasing order <input checked="" type="checkbox"/> A. Martensite, Fine pearlite, Coarse pearlite, Spheroidite B. Fine pearlite, Martensite, Spheroidite, Coarse pearlite C. Martensite, Coarse pearlite, Fine pearlite, Spheroidite D. Spheroidite, Coarse pearlite, Fine pearlite, Martensite	[A]
59	A simply supported laterally loaded beam was found to deflect more than a specified value. Which of the following measures will reduce deflection? <input checked="" type="checkbox"/> A. Increase the area moment of inertia B. Increase the span of the beam C. Select a different material having lesser modulus of elasticity D. Magnitude of the load to be increased	[A]
60	Maximum normal stress induced inside the material of thin cylinder is nothing but A. Radial stress <input checked="" type="checkbox"/> B. Hoop stress C. Longitudinal stress D. None of the above	[B]

Sub Part III:

61.	For the integer with decimal representation 34567, give the corresponding bit-vectors for the BCD code and for the Excess-3 code. <input checked="" type="checkbox"/> A. 0011 0100 0101 0110 0111, 0110 0111 1000 1010 B. 0110 0111 1000 1010, 0011 0100 0101 0110 0111 C. 110 111 100 101, 011 100 101 110 111 D. 011 100 101 110 111, 110 111 100 101	[A]
62	Fourier transform of unit step sequence is (A) $\pi\delta(\Omega)$ (B) $\frac{1}{1-e^{-j\Omega}}$ <input checked="" type="checkbox"/> (C) $\pi\delta(\Omega) + \frac{1}{1-e^{-j\Omega}}$ (D) $1 - e^{-j\Omega}$	[C]
63	Signal flow graphs: A. They apply to linear systems B. The equation obtained may or may not be in the form of cause or effect C. Arrows are not important in the graph D. They cannot be converted back to block diagram	[A]

71.	The output is said to be zero state response because _____ conditions are made equal to zero. A) Initial B) Final C) Steady state D) Impulse response	[A]
72.	The output of a linear system for step input is $t^2 e^{-2t}$, then transfer function is A) $\frac{s}{(s+1)^2}$ B) $\frac{2s}{(s+1)^2}$ C) $\frac{1}{s^2(s+1)}$ D) $\frac{1}{(s+1)^2}$	[B]
73	The purpose of cardiopulmonary resuscitation (CPR) is to: A. Maintain oxygenated blood circulation B. Stabilize body temperature to avoid hypothermia C. Build upper body strength D. Dislodge blood clots within the victim's lungs	[A]
74	What is the outcome of a periodic convolution of signals in case of continuous time Fourier series? A) Division in frequency domain B) Multiplication in frequency domain C) Convolution is easier D) Addition of signals in frequency domain	[B]
75	An ideal voltage source and a practical current source should have _____ source resistances respectively A) Large and Zero B) Small and infinite C) Zero and large D) Infinite and small	[C]
76	Which resistance plays a significant role in stabilization of Q-point for self-biasing circuit of BJT? A) Emitter resistance B) Collector resistance C) Source resistance D) All the three	[A]
77	How many 2-to-1 Multiplexers are needed to construct a 64-to-1 Multiplexer; how many levels will be there in the tree realization? A) 32, 1 B) 64, 6 C) 63, 6 D) 16, 4	[C]
78	A series RLC circuit has $Q=5.1$ at resonance frequency of 100 kHz and draws 0.8 Amp while dissipating 100 Watts. What's the bandwidth of this circuit? A) 9.8 kHz B) 19.6 kHz C) cannot be determined D) 10 kHz	[B]
79	In a N-type semiconductor, the position of the Fermi level is A. at the centre of the energy gap B. lower than the centre of energy gap C. higher than the centre of energy gap D. anywhere depending upon the doping concentration	[C]
80	If a 1 MHz carrier is amplitude modulated with a 5 kHz audio signal, the upper-side frequency is _____ kHz. A. 1005 B. 1000 C. 995 D. None of the above	[A]