

Time : 3 hours **2022(A) NEW** Full Marks : 70

Candidates are required to give their answers in their own words as far as practicable.
The figures in the right- hand margin indicate full marks.
Answer any five questions.

1. (a) What do you understand by CG? Discuss the components of computer graphics. [7]
(b) Distinguish between Raster and Vector Graphics method. When do you prefer what? [7]

2. (a) Discuss the DDA Line drawing algorithm in details. Also implement the DDA algorithm to draw a line from (0,0) to (4,4). [7]

(b) Write and explain Flood Fill Algorithm in details. [7]

3. (a) Write the Mid-Point Circle generating algorithm and also draw the derivation of decision parameter. [7]

(b) Describe boundary fill algorithm for polygon with example. [7]

4. (a) Magnify the triangle withy vertex A (0,0), B (1,1) and C (5,2) to twice its size while keeping C (5,2) fixed. What will be the new coordinate of the new triangle ABC. [7]
(b) Consider the square A (1,0), B (0,0), C(0,1),D(1,1). Rotate the square ABCD by 45 clockwise about A (1,0). [7]

5. (a) Determine the homogeneous transformation matrix for reflection about the line y=2x-6. [7]

(b) Why are homogenous coordinated used for transformation computation in CG? [7]

6. (a) Describe Sutherland Hodgeman Polygon Clipping algorithm. What is its limitation? [7]

(b) What is Window to View-Point coordinate transformation? Explain with suitable example. [7]

7. (a) Explain Painter's Algorithm in details. [7]
(b) Explain Gouraud Shading algorithm. Discuss its advantages and disadvantages. [7]

8. Write short notes on the following:
(a)CRT [4]
(b)RGB & CMY [6]
(c)Ray Tracing [4]

..... The End .....

2022(A) New

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Answer any **five** question

1. a) Define cloud computing? Differentiate between private and public cloud development model in terms of cost control and security. 7
   b) Explain the advantages and disadvantages of using cloud computing? 7

2. a) Define data security? What are the different security threats associated with cloud computing? 7
   b) What is security governance? What are the layers in security architecture design, explain in brief. 7

3. a) What are the different cloud service model, explain with suitable example? 7
   b) Explain open source software? How it differs from traditional software also explain advantages. 7

4. a) What is virtualization in cloud computing? Discuss software and software virtualization in brief. 7
   b) Explain mobile operating system? List feature of mobile operating system for smart phones. 7

5. a) What is public cloud? How public cloud is better over private computing?7
   b) Explain virtual machine? What is the need of virtual machine migration in cloud computing? 7

6. a) What is KVM? Explain KVM in brief and also mention difference between KVM and VM. 7
   b) Discuss the different security recommendation in virtualization in brief? 7

7. a) Define data breach. Explain IAM in brief? 7
   b) Compare monitoring as a service and platform as a service in details? 7

8. a) Explain cluster computing, grid computing and cloud computing in details and also mention suitable example? 7
   b) What is cloud data center? Explain basic approach to a data center based SOA? 7

UL (6)-Image Processing.

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1) a) What is digital image processing? Explain the component of image processing system. [7]

b) Discuss the effects of sampling and quantization. [7]

2) Compute the length of the shortest 4, 8 and m-path between P and Q. if a particular path does not exist between these two points, explain why? If **V= {1, 2}** [14]

3	1	2	1(Q)
2	2	0	2
1	2	1	1
(P)1	0	1	2

3) Perform histogram equalization of the image. [14]

Gray Level r_k	0	1	2	3	4	5	6	7
No. of Pixels P_k	6	8	11	12	3	5	15	6

4) Suppose a continuous valued image is conserved having

$$P_r(r) = \begin{cases} 2r/(L-1)^2 & ; 0<=r<=L-1. \\ 0; \text{ otherwise.} \end{cases}$$

Calculate $P_s(s)$ =? (Given $P_s(s) = P_r(r)\,(dr/ds)$) [14]

5 a) *What is the need for image compression?* Explain image compression standards in detail. [7]

b) *Explain image recognition based on matching.* [7]

6.) a) *Explain region based segmentation technique.* [7]

b) *Explain in detail the method for smoothing the image in frequency domain.* [7]

7) a) Explain in detail any two boundary representation schemes and illustrate with example. [7]

b) Calculate full correlation, crop correlation and convolution if 1-D function is 00010000 and W is 12328. [7]

[7 + 7]

8.) Write short notes on any two of the following:

a) Gray level slicing. b) Run Length Coding.

c) Histogram. d) Logarithmic transformation.

2022 (A) (New)

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Answer any **five** Questions.

1. (a) What do mean by an entrepreneur? Explain various types of entrepreneurs.
   (b) Define entrepreneurship. Differentiate between entrepreneurship and intrapreneurehip. 7+7 = 14

2. (a) Write down various qualities of an entrepreneur.
   (b) Explain how entrepreneurship helps in economy of country? 7+7 = 14

3. (a) Define market. Explain marketing strategies.
   (b) What do you mean by human resource management? Explain its objective. 7+7 = 14

4. (a) What do you mean by finance? What are various sources of finance for a project?
   (b) Discuss right financing for a project. 7+7 = 14

5. (a) What do you mean by business ownership? What are the various types of business ownerships ?
   (b) Differentiate between sale proprietorship and partnership. 7+7 = 14

6. (a) What do you understand by Intellectual Property Right (IPR)? What are its contents?
   (b) Discuss in brief the importance of innovation. 7+7 = 14

7. (a) Explain in brief various government supports for entrepreneurship development in India.
   (b) Explain the scope of rural entrepreneurship in our state Jharkhand. 7+7 = 14

8. Write short notes on any FOUR : $3\frac{1}{2}x4=14$
   (a) Feasibility analysis
   (b) Business Plan
   (c) Debt & Equity
   (d) Cooperative Society
   (e) Patent
   (f) Lease Financing

2022 (A) (New)

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Q.1. (a) What is the difference between a port address, a logical address and a physical address? What are different guided and unguided transmission medium. (7)

(b) How does an email go from the sender to the receiver? Described all the steps in the context of SMTP protocol. (7)

Q.2. (a) The message 1010001101 is to be transmitted using the CRC polynomial $X^5 + x^4 + x^2 + 1$ to protect it from errors. Show different steps to find the transmitted message. (7)

(b) Compare Standard Ethernet and Gigabit Ethernet implementation. Compare the data rates for Standard Ethernet, Fast Ethernet, Gigabit Ethernet and Ten- Gigabit Ethernet. (7)

Q.3. (a) Distinguish between multilevel TDM, multiple slot TDM and pulse-stuffed TDM. (7)

(b) How Slotted ALOHA protocol differs from pure ALOHA? Write the vulnerable time and maximum throughput for both the protocols. (7)

Q.4. (a) Define Nyquist formula for noiseless channel and Shannon formula for noisy channel to calculate the data rate. The SNR for a channel with a 1- MHz bandwidth is 63. Calculate appropriate bit rate and signal level. (7)

(b) Draw the graph of the NRZ-L, NRZ-I, Manchester and Differential Manchester encoding scheme, for the data stream **01001110**. (7)

Q.5. (a) Compare IPv4 and IPv6 header format. In an IPv4 packet, the value of HLEN is 5 and the value of total length field is 0x0028. How many bytes of data are being carried by packet? (7)

(b) Define subnetting and supernetting. How do the subnet mask and supernet mask differ from a default mask in classful addressing? (7)

Q.6. (a) What are four general techniques to improve Quality of Service? How Token Bucket technique can control the traffic sent to the network? (7)

(b) Compare the TCP header and the UDP header. List the fields in the TCP header that are missing from UDP header. Give the reason for their absence. (7)

Q.7. (a) A 1Mbps satellite link connects two ground stations. The altitude of the satellite is 36,504 km and speed of the signal is 3×10^8 m/s. What should be the packet size for a channel utilization of 25% for a satellite link using go-back-127 sliding window protocol? Assume that the acknowledgements packets are negligible in size and there are no errors are during communication. (7)

(b) Why ARP request is broadcast? Discuss the cases in which the services of ARP can be used. (7)

Q.8. Write short notes on any two of the following: (7X2)= 14

(a) Classless Addressing

(b) OSI Model

(c) Byte and Bit Stuffing

(d) PPP frame format

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1. (a) What is soft computing ? Differentiate the soft computing versus hard computing and write some applications of soft computing. [7]
   (b) Compare and contrast biological neuron and artificial neuron. List any four activation functions with their equations and graphs. [7]

2. (a) What is meant by supervised, reinforcement and unsupervised learning rules ? [7]
   (b) Explain the single layer Neural Network architecture using Perceptron model with suitable activation function. [7]

3. (a) Explain architecture of Bidirectional Associative Memory (BAM). How storage and retrieval performed in BAM. [7]
   (b) Explain Error back propagation training Algorithm with the help of flowchart. [7]

4. (a) What are Genetic Algorithms (GA)? Explain the operators in GA? [7]
   (b) Define Tautology. Prove the tautology using $((a \vee b) \wedge (\sim a \vee c)) \rightarrow (b \vee c)$ Truth values in Fuzzy Logic? [7]

5. (a) What are Fuzzy propositions? List the operations on Fuzzy propositions? [6]
   (b) Consider two fuzzy sets, $A = \{0.2/2 + 0.3/4 + 1/6 + 0.1/8 + 0.5/10\}$ and $B = \{0.1/2 + 0.25/4 + 0.9/6 + 0.7/8 + 0.3/10\}$, then Compute the Union, Intersection, Difference, Compliment, Algebraic sum, Algebraic product, Bounded sum and Bounded Difference over the sets A and B. [8]

6. (a) State the training algorithm for multiple output classes in Perceptron. [4]
   (b) Obtain the output of the neuron for a network with inputs are given as $[x1, x2] = [0.7, 0.8]$ and the weights are $[w1, w2] = [0.2, 0.3]$ with bias = 0.9.
   Use i) Binary sigmoidal activation function
   ii) Bipolar sigmoid activation function [4]
   (c) An athletic race was conducted. The following membership functions are defined based on the speed of athletes: $Low = \{0.2/100 + 0.4/200 + 0.3/300\}$, $Medium = \{0.5/100 + 0.58/200 + 0.6/300\}$, $High = \{0.7/100 + 0.8/200 + 0.99/300\}$. Find the following: (a). $R = Low \times Medium$. (b). $S = Medium \times High$. (c). $T = R \circ S$ using max-min composition. [6]

7. (a) Explain the features of membership functions? [3]
   (b) State the concept of delta-rule used in Adaptive Linear Neurons. [4]
   (c) Design a Hebb net to implement NOR function using with bipolar inputs and targets. [7]

8. Write short notes on any two of the following: [7+7=14]
   (a) McCulloch Pitts neuron Model
   (b) Binary Hopefield Network
   (c) Fuzzy Inference System (FIS)
   (d) Simulated annealing

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