

**SE - 03**

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**S.Y. B.Tech. (Computer Science and Engineering)**  
**(Semester - III) (CBCS) Examination, March - 2023**

**APPLIED MATHEMATICS**

**Sub. Code : 73276**

**Day and Date : Thursday, 15 - 06 - 2023**

**Total Marks : 70**

**Time : 2.30 p.m. to 05.00 p.m.**

- Instructions :**
- 1) Attempt any three questions from each section.
  - 2) Figures to the right indicates full marks.
  - 3) Use of non programmable calculator is allowed.

**SECTION-I**

**Q1) a)** Obtain the two equations of line of regression from the following data. [6]

x:	2	4	6	8	12	14
y:	4	2	5	10	11	12

**b)** Fit a straight line  $y = a + bx$  to following data. [6]

x:	1	2	3	4	6	8
y:	2.4	3	3.4	4	5	6

**Q2) a)** The probability that a missile will strike the target is  $1/5$ . if 6 such missiles are fixed. Find the probability that [5]

- i) exactly two,
- ii) at least 2 will strike the target.

**P.T.O.**

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- b) In certain factory turning out blades, there is small chance of 0.002 for any blade to be defective. The blades are supplied in packets of 10. Use Poisson's distribution to calculate the approximate number of packets containing, no defective, one defective and two defective blades in a consignment of 10000 packets. [6]

Q3) a) Evaluate  $\int_0^2 e^{x^2} dx$  using Trapezoidal Rule, Taking  $n=10$  subintervals. [5]

- b) Evaluate  $\int_{0.2}^{1.4} (\sin x - \log_e x + e^x) dx$  using Simpson's  $\left(\frac{1}{3}\right)^{rd}$  rule. [6]

Q4) Attempt any two from the following.

- a) Fit a second degree parabola to the following data. [6]

x:	1	2	3	4	5	6	7	8	9
y:	2	6	7	8	10	11	11	10	9

- b) An aptitude test for selecting engineers in a industry is conducted on 100 candidates. Average score is 42 and standard deviation is 24. Assuming normal distribution for the score, find probability of score of candidate selected randomly.

- i) lies between 30 to 60,  
ii) more than 60.

[Given : for S.N. V.z area from  $z=0$  to 0.5 is 0.1915, from  $z=0$  to  $z=0.75$  is 0.2734] [6]

- c) Evaluate  $\int_0^6 \frac{e^x}{1+x} dx$  using Weddle's Rule. [6]

**SECTION-II**

- Q5) a) Find  $\alpha$ -cut and strong  $\alpha$ -cut for  $\alpha = 0.2, 0.3, 0.4, 0.5$  for the fuzzy set

defined by  $C(x) = \frac{x}{x+1}, x \in \{1, 2, 3, 4, 5\}$  [6]

- b) Let the fuzzy sets A and B be defined on the same universal set X by

$$A(x) = \frac{2x}{2x+5}, B(x) = \frac{x}{x+1}, x \in \{6, 7, 8, 9, 10\}. \quad [6]$$

Find

i)  $A \cup \overline{A \cap B}$ .

ii)  $\alpha$ -cut of  $A \cup \overline{A \cap B}$  for  $\alpha = 0.9$

Q6) a) Find fuzzy cardinality of  $A(x) = \frac{1}{1} + \frac{0.5}{2} + \frac{0.6}{3} + \frac{0.7}{4} + \frac{0.2}{5}$  [5]

- b) Define fuzzy number and determine whether the following fuzzy set is a

fuzzy number  $A(x) = \begin{cases} \sin x & 0 \leq x \leq \pi \\ 0 & \text{otherwise} \end{cases}$  [6]

- Q7) A company has 4 machines which do 3 jobs. Each job can be assigned to one and only one machine. The cost of each job on each machine is given in the following table. What are the job assignments which will minimize the cost? [11]

	Machines				
Jobs		M1	M2	M3	M4
	J1	18	24	28	32
	J2	8	13	17	18
	J3	10	15	19	22

- Q8) Attempt any two from the following.

- a) Consider the fuzzy sets: [6]

$$A(x) = \frac{x}{x+2}, B(x) = \frac{x}{x+5}, x \in \{1, 2, 3, 4, 5\}. \text{ Find } S(A, B), S(B, A)$$



- b) Calculate the fuzzy number  $A + B, A - B$  where, [6]

$$A(x) = \begin{cases} \frac{x+2}{2} & -2 \leq x \leq 0 \\ \frac{2-x}{2} & 0 \leq x \leq 2 \\ 0 & \text{otherwise} \end{cases}$$

$$B(x) = \begin{cases} \frac{x-2}{2} & 2 \leq x \leq 4 \\ \frac{6-x}{2} & 4 \leq x \leq 6 \\ 0 & \text{otherwise} \end{cases}$$

- c) Solve the following assignment problem. [6]

	jobs				
		I	II	III	IV
Task	A	10	12	19	11
	B	5	10	7	8
	C	12	14	13	7
	D	8	15	11	9



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**S.Y. B.Tech. (Part - II) (CBCS) (Semester - III) (Revised)**  
**Examination, March - 2023**  
**MICROPROCESSORS**  
**Sub. Code : 73280**

Day and Date : Tuesday, 20 - 06 - 2023

Total Marks : 70

Time : 02.30 p.m. to 05.00 p.m.

- Instructions :
- 1) Question 3 a is compulsory and solve any one question from Q.3 b and Q.3 c.
  - 2) Question 6 a is compulsory and solve any one question from Q.6 b and Q.6 c.
  - 3) Figures to the right indicate full marks.

**SECTION - I**

**Q1) Solve any two question.**

- a) Write a short note on classification of instruction based on operand addressing. [6]
- b) Write a short note on following logical instructions related to 8085. [6]
  - i) ANA
  - ii) RLC
  - iii) CMC
- c) Write a short note on Program Memory (ROM) of 8051 Microcontroller. [6]

**Q2) Solve any two question.**

- a) Write a short note on any THREE of the following segment registers.[6]
  - i) Code Segment (CS)
  - ii) Data Segment (DS)
  - iii) Extra Segment (ES)
  - iv) Stack Segment (SS)

**P.T.O.**

- b) In Context with data-addressing Modes, Write a short note on any two of the following: [6]
- i) Immediate Addressing
  - ii) Base Relative-Plus-Index Addressing
  - iii) Scaled-Index Addressing
- c) Explain stack memory-addressing modes? [6]

- Q3)** a) Explain PUSH instruction and draw a diagram for effect of PUSH AX instruction. [6]
- b) With example explain 8 bit Division instruction. [5]
- OR
- c) With examples write a short note on 8-bit multiplication instruction. [5]

### SECTION - II

**Q4)** Solve any two question.

- a) Explain Shift Instructions. [6]
- b) List sequence of events occurs when interrupt occurs in Real Mode. [6]
- c) Explain with example 8086 Instructions for AND, OR and EXOR and its Purpose. [6]

**Q5)** Solve any two question.

- a) Explain 80386 protected mode addressing using Segment register as Selector. [6]
- b) Explain functions of Access Rights bits of segment Descriptor of 80386? [6]
- c) Explain Debug Register of 80386. [6]

- Q6)** a) Find the MASK value and explain with example for: [6]
- i) Setting Bit 0, 5, 7, 12, 15
  - ii) Clearing Bits position: 1, 4, 7, 9, 11
- b) List the functions of Pentium Pro Processor. [5]

OR

- c) Explain 64 bit Extension Technologies. [5]





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**S.Y. B.Tech. (Computer Science and Engineering) (Part - II)**  
**(Semester - III) (CBCS) Examination, March - 2023**

**DISCRETE MATHEMATICAL STRUCTURES**

**Sub. Code : 73277**

**Day and Date : Friday, 16 - 06 - 2023**

**Total Marks : 70**

**Time : 02.30 p.m. to 05.00 p.m.**

- Instructions :**
- 1) All questions are compulsory.
  - 2) Assume suitable data wherever necessary.

**Q1) Solve MCQs. (2 Marks Each)**

- a) Consider Set  $S = \{x : x \text{ is a real number between 1 and 2}\}$ , then S is \_\_\_\_\_ ?
  - i) Finite Set
  - ii) Infinite Set
  - iii) Large Set
  - iv) Fixed Set
- b) Which of the following statement is a proposition?
  - i) Get me a glass of milkshake
  - ii) God bless you!
  - iii) What is the time now?
  - iv) The only odd prime number is 2
- c) Which of the following statement is false
  - i)  $A \cap A = A$
  - ii)  $(A \cup B)' = A' \cup B'$
  - iii)  $A \cup A = A$
  - iv)  $A - (B \cap C) = (A - B) \cup (A - C)$
- d)  $A \rightarrow (A \vee Q)$  is a \_\_\_\_\_.
  - i) Tautology
  - ii) Contradiction
  - iii) Contingency
  - iv) None of the mentioned

**P.T.O.**

- e) A function is said to be \_\_\_\_\_ if and only if  $f(a) = f(b)$  implies that  $a = b$  for all  $a$  and  $b$  in the domain of  $f$ .
- i) One-to-many                      ii) One-to-one
- iii) Many-to-many                  iv) Many-to-one
- f) The relationship between TE and TL of Sink node in PERT graph is
- i)  $TE = TL$                           ii)  $TE > TL$
- iii)  $TE < TL$                         iv)  $TE \neq TL$
- g) Let a set  $S = \{2, 4, 8, 16, 32\}$  and  $\leq$  be the partial order defined by  $S \leq R$  if  $a$  divides  $b$ . Number of edges in the Hasse diagram of is
- i) 6                                      ii) 5
- iii) 4                                    iv) 3

**Q2) Solve any 2 of the following. (7 Marks Each)**

- a) Explain different operation on Sets
- b) What is Power set? Give the power set of i)  $S_1 = \{1, a, \{3\}\}$  ii)  $S_2 = \{\{\}, \emptyset\}$
- c) Show that  $(P \rightarrow (Q \rightarrow R)) \Leftrightarrow (P \wedge Q) \rightarrow R$ .

**Q3) Solve any 2 of the following. (7 Marks Each)**

- a) Let  $A = \{1, 2, 3, 4, 5, 6\}$  and let  $R$  be the relation  $x$  divides  $y$ .
- i) Write  $R$  as a set of ordered pairs
- ii) Draw its directed graph
- b) Define function and give the types of functions with example.
- c) Draw the Hasse diagram for Divide relation on  $\{1, 2, 3, 4, 8, 12, 16, 32, 64\}$ .



**Q4)** Solve any 2 of the following. (7 Marks Each)

- a) Define cyclic group. Prove that  $\langle \mathbb{Z}_5, + \rangle$  is Cyclic group.
- b) What is algebraic system? Explain monoid and sub-monoid with example.
- c) What is Lattice? Define LUB and GLB with example.

**Q5)** Solve any 2 of the following. (7 Marks Each)

- a) What is a graph? define the terms with example
  - i) simple Path
  - ii) Elementary Path
  - iii) Node base.
- b) Differentiate between Path Matrix and Adjacency Matrix with example.
- c) Explain the Isomorphic graph with appropriate example?

**x x x**

\_\_\_\_\_

CSE

Total No. of Pages: 2

Subject Name: B.Tech. CBCS\_86167\_86167 - Automata Theory\_15.06.2023\_10.30 AM To 01.00 PM  
Subject Code: 86167

**Day and Date: - Thursday, 15-06-2023**  
**Time: - 10:30 am to 01:00 pm**

**Total Marks: 70**

- 1) All questions are compulsory
- 2) Figures to the right indicate full marks
- 3) Assume suitable data wherever necessary and mention it boldly

- Q.1. a) Write down the difference between DFA and NFA. (8 Marks) [15]  
b) Convert NFA-A to an NFA and an FA for  $\{0\}^* \{01\}^* \{0\}^*$ . (7 Marks)

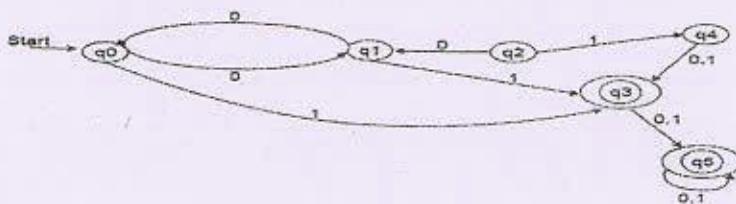


- Q.2. a) Convert the given Context free grammar to Chomsky Normal Form : (8 Marks) [15]

S  $\rightarrow$  AACD  
A  $\rightarrow$  aAb| $\Lambda$   
C  $\rightarrow$  aC|a  
D  $\rightarrow$  aDa|bDb| $\Lambda$

- b) Explain the Pumping Lemma for Context free language.(7 Marks)

- Q.3. a) Minimize the FA: (8 Marks) [15]



- b) Explain the Grammar and also its types.(7 Marks)**

Q.4. a) Construct Turing Machine for-(8 Marks)

[15]

i) Accept odd palindrome over  $\{a,b\}$

ii) Accept  $\{a, b\}^*\{aba\}$

or

a) Define Pushdown automata. Design PDA for given language with transition table-  $L = \{0^n 1^n 2^n, \text{ where } n > 0\}$  (8 Marks)

b) Difference between Top down and bottom up Parsing. (7 Marks)

or

b) A grammar G with the production rule: (7 Marks)

1.  $E \rightarrow I$

2.  $E \rightarrow E + E$

3.  $E \rightarrow E * E$

4.  $E \rightarrow (E)$

5.  $I \rightarrow \epsilon \mid 0 \mid 1 \mid 2 \mid \dots \mid 9$  For string " $3 * 2 + 5$ " grammar is ambiguous or unambiguous.

Q.5. Write a short note on any two : (5 Marks each)

[10]

i) Multi-tape Turing machine.

ii) Universal Turing machine.

iii) Markov Chains problem



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**S.Y. B.Tech. (Computer Science and Engineering) (Part - II)  
(CBCS) (Semester - IV) Examination, March - 2023**

**COMPUTER ORGANIZATION AND ARCHITECTURE**

**Sub. Code : 79141**

**Day and Date : Monday, 19 - 06 - 2023**

**Total Marks : 70**

**Time : 10.30 a.m. to 01.00 p.m.**

- Instructions :**
- 1) All questions are compulsory.
  - 2) Assume suitable data wherever necessary.

**Q1) Solve MCQs.**

**[2 Each]**

- a) The third generation of computers were using \_\_\_\_\_.
  - i) transistors
  - ii) vacuum tubes
  - iii) ICs
  - iv) None of these
- b) In an IO interface, SOUT holds \_\_\_\_\_ register.
  - i) serial
  - ii) parallel
  - iii) status
  - iv) output
- c) \_\_\_\_\_ is not example of standard IO device.
  - i) HARD DISC
  - ii) PCI
  - iii) SCSI
  - iv) USB
- d) MFC stands for \_\_\_\_\_.
  - i) Memory First Computer
  - ii) Memory Function Computer
  - iii) Memory Function Completed
  - iv) None of these
- e) In microprogrammed control unit, control signals are generated by
  - i) Program and hardware
  - ii) Hardware
  - iii) Program only
  - iv) None of these
- f) Instruction fetched by the fetch unit is deposited in \_\_\_\_\_.
  - i) intermediate storage buffer
  - ii) main memory
  - iii) RAM
  - iv) external device

**P.T.O.**

- g) Idle signal exist in \_\_\_\_\_ port
- |                               |                   |
|-------------------------------|-------------------|
| i) serial                     | ii) parallel      |
| iii) both serial and parallel | iv) none of these |

**Q2) Solve any two of the following. [7 Each]**

- a) Explain following types of instructions:
- Zero Address Instruction
  - One Address Instruction
  - Two Address Instruction
  - Three Address Instruction
- b) Draw and Explain IO interface for input device.
- c) Draw and explain an n-bit ripple carry adder.

**Q3) Solve any two of the following. [7 Each]**

- a) Differentiate between RISC and CISC.
- b) Explain the role of DMA controller.
- c) Convert following decimals to IEEE 754 Floating Point Format.
- |             |     |
|-------------|-----|
| i) -99.999  | [4] |
| ii) 111.111 | [3] |

**Q4) Solve any two of the following [7 Each]**

- a) What is role of MFCS?
- b) Draw and explain a 4-stage pipeline.
- c) Explain organization of bit cells in a memory chip.

**Q5) Solve any two of the following [7 Each]**

- a) Differentiate between Hardwired Control and Microprogrammed Control.
- b) What is operand forwarding in data hazards?
- c) Explain LRU page replacement algorithm with example.





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QP Code: 5807QP  
Total No. of Pages: 1

### Summer Examination March - 2023

Subject Name: B.Tech. CBCS\_86170\_86170 - Operating Systems\_21.06.2023\_10.30 AM To 01.00 PM  
Subject Code: 86170

Day and Date: - Wednesday, 21-06-2023  
Time: - 10:30 am to 01:00 pm

Total Marks: 70

**Instructions.:**

- 1) All questions are compulsory
- 2) Figures to the right indicate full marks
- 3) Assume suitable data wherever necessary and mention it boldly

- 
- Q.1. a) Explain types of operating system. (8 Marks) [15]  
b) Draw and explain PCB. (7 Marks)
- Q.2. a) Explain operations on files. (8 Marks) [15]  
b) Compare Sequential Execution and Multiprogramming Execution with diagram. (7 Marks)
- Q.3. a) Explain different Interprocess Communication Models with diagram. (8 Marks) [15]  
b) Draw & explain managing the memory hierarchy. (7 Marks)
- Q.4. a) What is Process concept? Explain Process in memory and Process state with diagram. (8 Marks) [15]  
Or  
a) Explain User perspective file system tree in UNIX with diagram. (8 Marks)  
b) Draw & explain architecture of UNIX System. (7 Marks)  
Or  
b) Draw & explain directory organized as a B+ tree. (7 Marks)
- Q.5. Write a short note on (Any 2) (5 Marks Each) [10]  
a) Device Driver  
b) Evolution of Operating System  
c) Comparison of paging and segmentation



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QP Code: 5443QP  
Total No. of Pages: 2

### Summer Examination March - 2023

Subject Name: B.Tech. CBCS\_86163\_86163 - Computer Networks\_19.06.2023\_02.30 PM To 05.00 PM  
Subject Code: 86163

Day and Date: - Monday, 19-06-2023  
Time: - 02:30 pm to 05:00 pm

Total Marks: 70

**Instructions.:**

- 1) All questions are compulsory
- 2) Figures to the right indicate full marks

- 
- Q.1. a) Explain the header format of UDP's user datagram? Give the applications of UDP. (8 Marks) [15]  
b) Explain Stop-and-Wait Protocol for error-free and Noisy channels. (7 Marks)
- Q.2. a) What is modulation? Explain with its types. (8 Marks) [15]  
b) Explain the concept of transmission impairment with an example. (7 Marks)
- Q.3. a) Explain CRC Error Detection with an example? (8 Marks) [15]  
b) Describe TCP/IP protocol model/suite in detail? (7 Marks)
- Q.4. a) Explain IP Datagram header format? (8 Marks) [15]  
OR  
a) Describe the 802.11 architecture in detail. (8 Marks)  
b) Describe classful addressing with its types and example for each class. (7 Marks)  
OR  
b) Write a short note on the following:  
1. Three phases of TCP connection (4 Marks)  
2. TCP Segment (3 Marks)

Q.5. Solve any 10 MCQs (1 Mark Each)

[10]

A. The number of bit positions in which two codewords differ is called \_\_\_\_ distance.

- a) Bush    b) Hamming    c) Clinton    d) Trump

B. What is the format of IP address?

- a) 34 bit    b) 64 bit    c) 16 bit    d) 32 bit

C. The OSI model is composed of \_\_\_\_ ordered layers.

- a) 1    b) 2    c) 7    d) 9

D. Each frame begins and ends with a special bit pattern, \_\_\_\_ in hexadecimal. This pattern is a flag byte.

- a) 01111110    b) 01101110    c) 00111110    d) 01111100

E. A packet used for the transmission purpose is basically a combination of

- a) group of bits    b) source & destination addresses    c) both a & b    d) none of the above

F. UDP stands for \_\_\_\_.

- a) Upper Datagram Protocol    b) Upper Database Protocol    c) User Datagram Protocol    d) User Database Protocol

G. A message is divided into transmittable segments, with each segment containing a \_\_\_\_ number.

- a) Row    b) Sequence    c) Column    d) None of the above

H. The \_\_\_\_ layer is responsible for process-to-process delivery of the entire message.

- a) Transport    b) Data Link    c) Physical    d) Network

I. Which data communication method is used to send data over a serial communication link?

- a) Simplex    b) Half Duplex    c) Full Duplex    d) Both (b) and (c)

J. SCTP stands for \_\_\_\_.

- a) Stream Control Transmission Protocol    b) System Control Transmission Protocol    c) Stream Cancel Transfer Protocol    d) System Control Transmission Protocol

K. Before data can be transmitted, they must be transformed to \_\_\_\_.

- a) Periodic signal    b) Electromagnetic signal    c) Aperiodic signal    d) low-frequency sine waves

L. When we compare OSI and TCP/IP Protocol Suite, \_\_\_\_ are missing from the TCP/IP protocol suite.

- a) Session and presentation    b) Session and Transport    c) Session and Physical    d) Transport and Physical



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**S.Y. B.Tech. (Computer Science and Engineering) (Part - II)  
(CBCS) (Semester - III) Examination, March - 2023**

**TRANSDUCER AND MEASUREMENT**

**Sub. Code : 73249**

**Day and Date : Tuesday, 20 - 06 - 2023**

**Total Marks : 70**

**Time : 02.30 p.m. to 05.00 p.m.**

- Instructions :**
- 1) All questions are compulsory.
  - 2) Figures to the right indicate full marks.

**Q1) Solve MCQ.**

**[2×7=14]**

- i) Capacitive transduction involves \_\_\_\_\_.
  - a) change in resistance
  - b) change in inductance
  - c) change in resistance
  - d) change in capacitance
- ii) Inductive transduction involves \_\_\_\_\_.
  - a) change in self inductance
  - b) change in capacitance
  - c) change in mutual inductance
  - d) change in resistance
- iii) Analog transducers convert input into
  - a) Voltage
  - b) Current
  - c) Digital
  - d) Analog
- iv) Strain gauge has a
  - a) low temperature coefficient of resistance
  - b) high temperature coefficient of resistance
  - c) zero temperature coefficient of resistance
  - d) infinite temperature coefficient of resistance
- v) The output of a transducer must
  - a) be less reliable
  - b) be highly reliable
  - c) not be reliable
  - d) be of medium reliability
- vi) The transducer output is \_\_\_\_\_.
  - a) exponential
  - b) unit step
  - c) non-linear
  - d) Linear

**P.T.O.**



vii) What is a data acquisition system?

- a) system used for data processing, conversion and transmission
- b) accepts data as an input
- c) removes noise
- d) boosts the signal

Q2) Attempt any two.

[2×7=14]

- a) With the help of principle, construction and working explain the electromagnetic flow meter.
- b) Explain with the help of neat diagram the motion transducer write the advantages and disadvantages.
- c) Explain phototransistor with the help of symbol. Construction, working and applications.

Q3) Attempt any two.

[2×7=14]

- a) What is transducer? Explain the various factors for the selection of transducer for a specific application.
- b) With the help of a neat block diagram explain the operation of dual slope ADC.
- c) Explain rotary variable differential transformer. Write the advantages and Disadvantages.

Q4) Attempt any two.

[2×7=14]

- a) Explain working of Q-meter in detail.
- b) With block schematic. Explain sampling CRO.
- c) Explain working principle and applications of LED.

Q5) Attempt any two.

[2×7=14]

- a) Explain in detail Digital frequency meter.
- b) Explain in detail General specifications of DVM.
- c) With block Schematic explain function generator.



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**S.Y. B.Tech. (Computer Science Engineering) (Part - II)**  
**(CBCS) (Semester - IV) Examination, March - 2023**  
**SOFTWARE ENGINEERING**  
**Sub. Code : 79143**

Day and Date : Saturday, 24 - 06 - 2023

Total Marks : 70

Time : 10.30 a.m. to 01.00 p.m.

- Instructions :
- 1) All Questions are compulsory.
  - 2) Assume suitable data wherever necessary.
  - 3) Figures to the right indicate full marks.

Q1) Solve MCQs.

[14×1=14]

- a) Quality of a software contains which among the following
- i) Functionality
  - ii) Usability
  - iii) Portability
  - iv) All
- b) Which among the following phase is present in Project Management Process.
- i) Planning
  - ii) Monitoring and Control
  - iii) Termination Analysis
  - iv) All
- c) Which among the following document is produced in Waterfall model
- i) Requirements
  - ii) Software manuals
  - iii) Design
  - iv) All
- d) Big bang approach is a disadvantage of which software development process Model
- i) Waterfall Model
  - ii) Prototyping Model
  - iii) Timebox Model
  - iv) Iterative Development Model

P.T.O.



- e) In IEEE second E stands for \_\_\_\_.
- Electrical
  - Electronics
  - Engineers
  - Easy
- f) Which among the following is an error in SRS?
- Omission
  - Inconsistency
  - Ambiguity
  - All of the above
- g) Which among the following is a technique used to represent complex logic in software engineering?
- Decision Tree
  - Decision Table
  - Both (i) & (ii)
  - None
- h) Which among the following is a characteristic of good SRS document?
- It should be concise
  - It should be traceable
  - It should be structured
  - All of the above
- i) Which among the following is a characteristic of bad SRS document?
- It should be concise
  - It should be traceable
  - Ambiguity
  - All of the above
- j) Which among the following is the responsibility of Project Manager?
- Assigning task to team members
  - Resolving issues
  - Responsible for planning and scheduling
  - All of the above
- k) Which among the following is the principle of effective project planning.
- Risk Analysis
  - Meeting quality standards
  - Flexibility
  - All of the above
- l) In WBS the task that takes 2 weeks or less than 2 week to execute is called as \_\_\_\_.
- Parent node
  - Root node
  - Leaf node
  - None of the above
- m) What is MTTF?
- Maximum time to failure
  - Mean time to failure
  - Minimum time to failure
  - None of the mentioned

- n) How is software reliability defined?
- time
  - efficiency
  - quality
  - speed

Q2) Solve any two of the following. [2×7=14]

- With a neat diagram explain Waterfall software development process model
- What is SRS and explain desirable characteristics of an SRS?
- What is scheduling? List and explain the skills of project manager.

Q3) Solve any two of the following. [2×7=14]

- State the meaning of project management process and briefly explain the 3 major phases of it.
- Write a short note on requirement process.
- Write a note on project staffing.

Q4) Solve any two of the following. [2×7=14]

- What is cohesion? Discuss various levels of cohesion.
- Write a note on Coding.
- Write a note on software reliability.

Q5) Solve any two of the following. [2×7=14]

- Explain the major steps involved in structured design methodology.
- Write a note on program analysis tools.
- Write a short note on Agile Project Management.

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[7 each]

Q3) Solve any two of the following

- Explain multiprogramming operating system.
- Explain the process state transitions of processes using a diagram.
- Draw and explain different types of schedulers.

**SECTION - II**

Q4) Solve any two of the following

[7 each]

- What is deadlock? Comment on concept of deadlock with an example.
- What is Static and dynamic memory allocation?
- Give an account of Sequential File Organization.

Q5) Solve any two of the following

[7 each]

- Give an account of deadlock avoidance in detail.
- Write note on,
  - Paging
  - Segmentation
- Comment on Facilities Provided by the File System and IOCS.



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**S.Y. B.Tech. (Computer Science and Engineering) (Part - II)**  
**(CBCS) (Semester - IV) Examination, March - 2023**

**OPERATING SYSTEMS - I****Sub. Code : 79142****Day and Date : Wednesday, 21 - 06 - 2023****Total Marks : 70****Time : 10.30 a.m. to 01.00 p.m.**

- Instructions :**
- All questions are compulsory.
  - Assume suitable data wherever necessary.
  - Figures to the right indicate full marks.

**SECTION - I**

Q1) Solve MCQs.

[1 each]

- To access the services of the operating system, the interface is provided by the \_\_\_\_\_
  - Library
  - System calls
  - Assembly instructions
  - API
- What is an operating system?
  - interface between the hardware and application programs
  - collection of programs that manages hardware resources
  - system service provider to the application programs
  - all of the mentioned
- In a timeshare operating system, when the time slot assigned to a process is completed, the process switches from the current state to?
 

|                    |                     |
|--------------------|---------------------|
| a) Suspended state | b) Terminated state |
| c) Ready state     | d) Blocked state    |



- iv) A process is more than a program code, which is sometimes known as the
  - a) text section
  - b) content of the processors registers
  - c) stack
  - d) Data section
- v) Which state of the process defined "The process is being created"
  - a) New
  - b) Running
  - c) Ready
  - d) Waiting
- vi) Each process is represented in the operating system by a
  - a) Process control block
  - b) Printed circuit board
  - c) Program control block
  - d) Problem control block
- vii) The processes that are residing in main memory and are ready and waiting to execute are kept on a list called
  - a) job queue
  - b) ready queue
  - c) execution queue
  - d) process queue
- viii) The interval from the time of submission of a process to the time of completion is termed as
  - a) waiting time
  - b) turnaround time
  - c) response time
  - d) throughput
- ix) In \_\_\_\_\_, processes remain blocked indefinitely, which affects user service, throughput and resource efficiency.
  - a) Deadlock
  - b) Resource Allocation
  - c) Resource Synchronization
  - d) Process Synchronization

- x) All the information regarding resource allocation with its state is simply called the \_\_\_\_\_ of a system.
  - a) synchronization state
  - b) resource state
  - c) allocation state
  - d) deadlock state
- xi) "Association of memory addresses with instructions and data of a program" is nothing but \_\_\_\_\_.
  - a) Memory binding
  - b) Memory hierarchy
  - c) Memory fragmentation
  - d) Memory allocation
- xii) Disk in virtual memory is managed by the \_\_\_\_\_.
  - a) disk Management
  - b) kernel
  - c) disk allocation techniques
  - d) memory managing hierarchy
- xiii) A file system provides several file types. Each type gives its own abstract view of data in a file. We call it a \_\_\_\_\_ of data.
  - a) structural View
  - b) logical View
  - c) abstract view
  - d) system view
- xiv) Data can be comfortably stored for a period of time.
  - a) True
  - b) False

Q2) Solve any two of the following

[7 each]

- a) Discuss an abstract view of an Operating system
- b) What are the different synchronization approaches?
- c) What are the different scheduling terminologies?



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**Q4) Solve any 2 of the following (7 Marks Each) :**

- a) Explain following tree terminologies with suitable example :
  - i) Terminal Nodes
  - ii) Degree of a Node
  - iii) Degree of a Tree
- b) What is use of Binary Search Tree? Construct BST for following set of key values. 55, 45, 30, 65, 54, 32, 35, 50, 61
- c) Explain Graph basic concepts and its storage representation.

**Q5) Solve any 2 of the following (7 Marks Each) :**

- a) Explain Heap sort with example.
- b) Difference between DFS and BFS.
- c) Explain tree traversal techniques with example.
  - i) Inorder
  - ii) Preorder
  - iii) Postorder

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**S.Y. B.Tech. (Computer Science and Engineering) (Part - II)**  
**(Semester - III) (CBCS) Examination, March - 2023**

**DATA STRUCTURES****Sub. Code : 73278****Day and Date : Saturday, 17 - 06 - 2023****Total Marks : 70****Time : 02.30 p.m. to 05.00 p.m.**

- Instructions :**
- 1) All questions are Compulsory.
  - 2) Assume suitable data wherever necessary.
  - 3) Figures to the right indicate full marks.

**Q1) Solve MCQs. (1 Marks Each) :**

- i) Which of the following is/are the levels of implementation of data structure
  - a) Abstract level
  - b) Application level
  - c) Implementation level
  - d) All of the above
- ii) \_\_\_\_\_ is not the component of data structure.
  - a) Operations
  - b) Storage Structures
  - c) Algorithms
  - d) None of above
- iii) Which data structure allows deleting data elements from and inserting at rear?
  - a) Stacks
  - b) Queues
  - c) Dequeues
  - d) Binary search tree
- iv) In \_\_\_\_\_, search start at the beginning of the list and check every element in the list.
  - a) Linear search
  - b) Binary search
  - c) Hash Search
  - d) Binary Tree search
- v) Which of the following is not the internal sort?
  - a) Insertion Sort
  - b) Bubble Sort
  - c) Merge Sort
  - d) Heap Sort

**P.T.O.**



- xii) The property of binary tree is
- The first subset is called left subtree
  - The second subtree is called right subtree
  - The root cannot contain NULL
  - The right subtree can be empty
- xiii) In general, the binary search method needs no more than \_\_\_\_\_ comparisons.
- $\lceil \log_2 n \rceil - 1$
  - $\lceil \log n \rceil + 1$
  - $\lceil \log_2 n \rceil$
  - $\lceil \log_2 n \rceil + 1$
- xiv) A graph is a collection of nodes, called \_\_\_\_\_ And line segments called arcs or that connect pair of nodes.
- vertices, edges
  - edges, vertices
  - vertices, path
  - graph node, edge

**Q2) Solve any 2 of the following (7 Marks Each) :**

- What is data structure? Explain the classification of data structures in details.
- Explain working of the Selection Sort Algorithm. Comment on Complexity of Merge Sort.
- Convert the following infix expression to postfix using stack  $(a + b) * (c / d - e)$  show the contents of stack at every step of conversion.

**Q3) Solve any 2 of the following (7 Marks Each) :**

- Explain Priority queue in details? Write a note on applications of Priority queues.
- List and explain the Asymptotic Notations for analysis of Algorithms.
- Explain the following operations on the circular linked list :
  - Insertion
  - Searching
  - traversing

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Total No. of Pages : 3

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**S.Y.B.Tech. (Computer Science and Engineering (AIML))****(Semester - III) (CBCS) Examination, March - 2023****PROBABILITY AND STATISTICS****Sub. Code : 86160****Day and Date : Thursday, 15 - 06 - 2023****Total Marks : 70****Time : 2.30 p.m. to 5.00 p.m.**

- Instructions :**
- 1) Solve any three questions from Q.1 to Q.4.
  - 2) Solve any three questions from Q.5 to Q.8.
  - 3) Figures to the right indicate full marks.
  - 4) Use of non-programable calculator is allowed.

**Q1) a) Find the median and mode for the following data. [6]**

|                |      |       |       |       |       |       |
|----------------|------|-------|-------|-------|-------|-------|
| Class Interval | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 |
| Frequency      | 14   | 17    | 22    | 26    | 23    | 18    |

**b) Calculate the mean deviation from mean of the following data. [6]**

|                |      |       |       |       |       |       |       |
|----------------|------|-------|-------|-------|-------|-------|-------|
| Class Interval | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 |
| Frequency      | 8    | 12    | 10    | 8     | 3     | 2     | 7     |

**Q2) a) Calculate the coefficient of correlation between x and y for the following data. [5]**

|   |    |    |    |   |   |    |
|---|----|----|----|---|---|----|
| x | 2  | 4  | 5  | 6 | 8 | 11 |
| y | 18 | 12 | 10 | 8 | 7 | 5  |

**b) Find the equation of line of regression y on x for the following data. [6]**

|   |    |    |    |    |    |    |    |
|---|----|----|----|----|----|----|----|
| x | 36 | 32 | 34 | 31 | 32 | 32 | 34 |
| y | 35 | 33 | 31 | 30 | 34 | 32 | 36 |

**P.T.O.**



Q3) a) If the mean of the Binomial distribution is 2 and the variance is  $\frac{4}{3}$ , find the probability of two successes. [5]

b) The marks obtained by 1000 students in an examination are found to be normally distributed with mean 14 and standard deviation 2.5. Find the number of students getting marks.

i) Between 12 and 15,

ii) Above 18.

[Given : for S.N.V.  $z$  are a between  $z=0$  and  $z=0.4$  is 0.1554, that between  $z=0$  and  $z=0.8$  is 0.2881, that between  $z=0$  and  $z=1.6$  is 0.4452] [6]

Q4) a) Fit the curve  $y=ab^x$  to the following data. [6]

|     |   |     |     |     |     |     |     |     |
|-----|---|-----|-----|-----|-----|-----|-----|-----|
| $x$ | 1 | 2   | 3   | 4   | 5   | 6   | 7   | 8   |
| $y$ | 1 | 1.2 | 1.8 | 2.5 | 3.6 | 4.7 | 6.6 | 9.1 |

b) Five percent of the resistors produced by a company are defective. If the quality control engineer selects 10 such resistors and inspect them. Find the probability that.

i) Sample selected contains at the most one defective resistor.

ii) Sample selected contains at least one defective resistor. [6]

Q5) a) In a sample of 400 parts manufactured by a factory, the number of defective parts was found to be 30. The company, however claimed that atmost 5% of their product is defective. Is the claim tenable? [6]

b) A company has the head office at Kolkata and a branch office at Mumbai. The personnel director wanted to know if the workers at the two places would like the introduction of a new plan of work and a survey was conducted for this purpose. Out of a sample of 500 workers at Kolkata, 62% favoured the new plan. At Mumbai, out of a sample of 400 workers, 41% were against the new plan. Is there any significant difference between the two groups in their attitude towards the new plan at 5% level. [6]

Q6) a) If the fuzzy sets A and B are defined by [6]

$$A(x) = \frac{0.6}{x_1} + \frac{0.8}{x_2} + \frac{0.9}{x_3} + \frac{0.7}{x_4} + \frac{0.1}{x_5}, B(x) = \frac{0.7}{x_1} + \frac{0.5}{x_2} + \frac{0.2}{x_3} + \frac{0.1}{x_4} + \frac{0}{x_5}$$

find  $\bar{A} \cap B, A \cup \bar{B}, A \cup \bar{A}, B \cup \bar{B}$ .

b) Let A and B be fuzzy set [5]

$$A = \frac{0}{1} + \frac{0.2}{1.5} + \frac{0.35}{2} + \frac{0.15}{2.5} + \frac{0.5}{3} + \frac{0.25}{3.5} + \frac{0.4}{4}$$

$$B = \frac{1}{1} + \frac{0.15}{1.5} + \frac{0.2}{2} + \frac{0.35}{2.5} + \frac{0.4}{3} + \frac{0.15}{3.5} + \frac{0}{4}$$

Find the fuzzy cardinality of  $\bar{A} \cup B$

Q7) Solve the following assignment problem. [11]

|          |     | Jobs |     |     |     |     |
|----------|-----|------|-----|-----|-----|-----|
|          |     | A    | B   | C   | D   | E   |
| Machines | I   | 130  | 100 | 145 | 160 | 170 |
|          | II  | 105  | 90  | 100 | 130 | 145 |
|          | III | 110  | 80  | 125 | 140 | 155 |
|          | IV  | 20   | 20  | 50  | 50  | 80  |
|          | V   | 25   | 5   | 40  | 50  | 75  |

Q8) a) In order to test whether a coin is perfect, it is tossed 6 times The null hypothesis of perfectness is rejected if and only if more than 5 heads are obtained. Obtain the. [6]

i) Critical region

ii) Probability of type I error

iii) Probability of type II error, when the corresponding probability of getting a head is 0.2.

b) Define  $\alpha$ -cut and strong  $\alpha$ -cut and find  $\alpha$ -cuts and strong  $\alpha$ -cuts of

$$B(x) = 1 - \frac{x}{10}, X = \{0, 1, 2, \dots, 10\} \text{ for } \alpha = 0.2, 0.4. [6]$$



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Q5) Solve any 2 of the following (7 Marks Each) :

- Explain flow control and error control mechanism of TFTP.
- With neat diagram explain architecture of E-mail system.
- Draw and Explain architecture of H.323.

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**S.Y. B.Tech. (Computer Science and Engineering) (Part - II)**  
**(Semester - IV) (CBCS) Examination, March - 2023**  
**COMPUTER NETWORKS - II**  
**Sub. Code : 79140**

Day and Date : Saturday, 17 - 06 - 2023

Total Marks : 70

Time : 1030 a.m. to 01.00 p.m.

- Instructions :
- All questions are Compulsory.
  - Assume suitable data wherever necessary.
  - Figures to the right indicate full marks.

Q1) Solve MCQs. (1 Marks Each) :

- At server side, sendto () function is used to \_\_\_\_\_.
  - Send request
  - Send response
  - Send acknowledge
  - None of these
- Which classes are used for connection-less socket programming?
  - Datagram Socket
  - Datagram Packet
  - Both Datagram Socket & Datagram Packet
  - Server Socket
- Purpose of Listen () function at server side \_\_\_\_\_.
  - To show ready to receive status
  - To show ready to send response
  - To send acknowledge
  - None of these
- In Ipv6, Traffic class is also called as \_\_\_\_\_.
  - Set class
  - Management class
  - Priority class
  - None of these

P.T.O.



- v) ICMPv6 includes \_\_\_\_\_.  
a) IGMP  
b) ARP  
c) RARP  
d) a and b
- vi) Which of these is not a type of error-reporting message?  
a) Destination unreachable  
b) Source quench  
c) Router error  
d) Time exceeded
- vii) The \_\_\_\_\_ domain is used to map an address to a name.  
a) Generic  
b) Country  
c) Sub-domains  
d) Inverse
- viii) DHCP (dynamic host configuration protocol) provides \_\_\_\_\_ to the client.  
a) IP address  
b) MAC address  
c) Url  
d) None of the mentioned
- ix) Which operating mode of telnet is full duplex?  
a) default mode  
b) server mode  
c) line mode  
d) character mode
- x) Identify the incorrect statement regarding FTP.  
a) FTP stand for File Transfer Protocol  
b) FTP uses two parallel TCP connections  
c) FTP sends its control information in-band  
d) FTP sends exactly one file over the data connection
- xi) HTTP message is similar in the form to an  
a) C++  
b) SMTP  
c) TCP  
d) Perl
- xii) Statue line is present in which message format.  
a) Request message  
b) Response message  
c) Both request and response  
d) Neither request nor response

- xiii) Real time streaming protocol is used
- a) To control streaming media servers
  - b) For establishing and controlling media sessions between endpoints
  - c) To provide real time control of playback of media files from the server
  - d) All of the mentioned
- xiv) Real time transport protocol mostly used in \_\_\_\_\_.
- a) Streaming media
  - b) Video teleconference
  - c) Television services
  - d) All of the mentioned

**Q2) Solve any 2 of the following (7 Marks Each) :**

- Explain create(), sendto(), recvfrom(), listen() socket system call.
- Draw and explain IPV6 datagram format.
- Explain DHCP Packet format.

**Q3) Solve any 2 of the following (7 Marks Each) :**

- Explain in detail multiprotocol server and multiprocess server.
- Do as directed :

Show abbreviations for the following addresses :

- 0000:0001:0000:0000:0000:0000:1200:1000
- 1234:2346:0000:0000:0000:0000:0000:1111
- An address with 128 0s
- An address with 128 1s.

- c) Discuss the DNS Message in detail.

**Q4) Solve any 2 of the following (7 Marks Each) :**

- Explain FTP command processing. List and describe at least two commands from each group of FTP commands.
- What are the types of web Documents explain in detail?
- Discuss in detail about RTP and RCTP.



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**S.Y. B.Tech. (Computer Science and Engineering) (Part - II)**  
**(Semester - III) (CBCS) Examination, March - 2023**  
**DISCRETE MATHEMATICAL STRUCTURES**

**Sub. Code : 73277**

**Day and Date : Friday, 16 - 06 - 2023**

**Total Marks : 70**

**Time : 02.30 p.m. to 05.00 p.m.**

- Instructions :**
- 1) All questions are compulsory.
  - 2) Assume suitable data wherever necessary.

**Q1) Solve MCQs. (2 Marks Each)**

- a) Consider Set  $S = \{x : x \text{ is a real number between 1 and 2}\}$ , then S is \_\_\_\_\_ ?
  - i) Finite Set
  - ii) Infinite Set
  - iii) Large Set
  - iv) Fixed Set
- b) Which of the following statement is a proposition?
  - i) Get me a glass of milkshake
  - ii) God bless you!
  - iii) What is the time now?
  - iv) The only odd prime number is 2
- c) Which of the following statement is false
  - i)  $A \cap A = A$
  - ii)  $(A \cup B)' = A' \cup B'$
  - iii)  $A \cup A = A$
  - iv)  $A - (B \cap C) = (A - B) \cup (A - C)$
- d)  $A \rightarrow (A \vee Q)$  is a \_\_\_\_\_.
  - i) Tautology
  - ii) Contradiction
  - iii) Contingency
  - iv) None of the mentioned

**P.T.O.**



- e) A function is said to be \_\_\_\_\_ if and only if  $f(a)f(b)$  implies that  $a = b$  for all  $a$  and  $b$  in the domain of  $f$ .
- i) One-to-many                      ii) One-to-one  
iii) Many-to-many                  iv) Many-to-one
- f) The relationship between TE and TL of Sink node in PERT graph is
- i)  $TE = TL$                           ii)  $TE > TL$   
iii)  $TE < TL$                           iv)  $TE \neq TL$
- g) Let a set  $S = \{2, 4, 8, 16, 32\}$  and  $\leq$  be the partial order defined by  $S \leq R$  if  $a$  divides  $b$ . Number of edges in the Hasse diagram of  $S$  is
- i) 6                                          ii) 5  
iii) 4                                          iv) 3

**Q2) Solve any 2 of the following. (7 Marks Each)**

- a) Explain different operation on Sets
- b) What is Power set? Give the power set of i)  $S_1 = \{1, a, \{3\}\}$  ii)  $S_2 = \{\{\}, \emptyset\}$
- c) Show that  $(P \rightarrow (Q \rightarrow R)) \Leftrightarrow (P \wedge Q) \rightarrow R$ .

**Q3) Solve any 2 of the following. (7 Marks Each)**

- a) Let  $A = \{1, 2, 3, 4, 5, 6\}$  and let  $R$  be the relation  $x$  divides  $y$ .
- i) Write  $R$  as a set of ordered pairs  
ii) Draw its directed graph
- b) Define function and give the types of functions with example.
- c) Draw the Hasse diagram for Divide relation on  $\{1, 2, 3, 4, 8, 12, 16, 32, 64\}$ .

**Q4) Solve any 2 of the following. (7 Marks Each)**

- a) Define cyclic group. Prove that  $\langle \mathbb{Z}_5, + \rangle$  is Cyclic group.
- b) What is algebraic system? Explain monoid and sub-monoid with example.
- c) What is Lattice? Define LUB and GLB with example.

**Q5) Solve any 2 of the following. (7 Marks Each)**

- a) What is a graph? define the terms with example
- i) simple Path  
ii) Elementary Path  
iii) Node base.
- b) Differentiate between Path Matrix and Adjacency Matrix with example.
- c) Explain the Isomorphic graph with appropriate example?

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**S.Y. B.Tech. (Computer Science and Engineering) (Part - II)  
(CBCS) (Semester - III) Examination, March - 2023**

**COMPUTER NETWORKS - I**

**Sub. Code : 73279**

**Day and Date : Monday, 19 - 06 - 2023**

**Total Marks : 70**

**Time : 02.30 p.m. to 05.00 p.m.**

- Instructions :**
- 1) All questions are compulsory.
  - 2) Figures to the right indicate full marks.
  - 3) Assume suitable data, wherever necessary.

**Q1) Solve MCQs.**

**[1 each]**

- i) In OSI model, which of the following layer provides error-free delivery of data?
  - a) Network layer
  - b) Transport layer
  - c) Session layer
  - d) Data link layer
- ii) How many bits internet address is assigned to each host on a TCP/IP internet which is used in all communications with the host?
  - a) 16 bits
  - b) 32 bits
  - c) 48 bits
  - d) 64 bits
- iii) Flow control in OSI models is done by
  - a) Data link layer
  - b) Network layer
  - c) Transport layer
  - d) Both data link and transport layers
- iv) ARQ stands for
  - a) Automatic repeat quantization
  - b) Automatic repeat request
  - c) Automatic retransmission request
  - d) Acknowledge repeat request
- v) In cyclic redundancy checking, what forms the check bits?
  - a) Remainder
  - b) Divisor
  - c) Quotient
  - d) Dividend

**P.T.O.**



- vi) Which error detection method involves polynomials?
  - a) CRC
  - b) Simple parity check
  - c) Two dimensional parity check
  - d) checksum
- vii) In \_\_\_\_\_, each station is forced to send only at the beginning of the time slot.
  - a) pure ALOHA
  - b) slotted ALOHA
  - c) both (a) and (b)
  - d) neither (a) nor (b)
- viii) In \_\_\_\_\_ methods, no station is superior to another station and none is assigned the control over another.
  - a) random access
  - b) controlled access
  - c) channelization
  - d) none of the above
- ix) The number of addresses assigned to an organization in classless addressing \_\_\_\_\_.
  - a) can be any number
  - b) must be a multiple of 256
  - c) must be a power of 2
  - d) none of the above
- x) The number of addresses in a class A block is \_\_\_\_\_.
  - a) 65, 534
  - b) 16, 777, 216
  - c) 256
  - d) none of the above
- xi) Which of the following is the Ethernet broadcast address used in ARP and RARP requests?
  - a) 255.255.255.255
  - b) 08:00:20:11 :aa:01
  - c) ff:ff:ff:ff:ff:ff
  - d) 224.0.0.0
- xii) Internet Control Message Protocol (ICMP) has been designed to compensate \_\_\_\_\_.
  - a) Error-reporting
  - b) Error-correction
  - c) Host and management queries
  - d) All of the mentioned
- xiii) Which of the following are transport layer protocols used in networking?
  - a) TCP and FTP
  - b) UDP and HTTP
  - c) TCP and UDP
  - d) HTTP and FTP
- xiv) Which of the following is false with respect to UDP?
  - a) Connection-oriented
  - b) Unreliable
  - c) Transport layer protocol
  - d) Low overhead

- Q2)** Solve any two of the following. **[7 each]**
- Describe the types of communication between the devices with suitable diagram and examples.
  - Perform bit stuffing at sender side and de-stuffing at the receiver side for given data Message: 11011111110111110010
  - Explain the slotted ALOHA technique and efficiency of the slotted protocol.
- Q3)** Solve any two of the following. **[7 each]**
- Outline OSI Reference model and explain the each layer in detail
  - List and explain the design Issues of the Data Link Layer.
  - Explain Collision tree Protocols: Polling methods.
- Q4)** Solve any two of the following. **[7 each]**
- Define routing. Discuss the Properties of good Routing Algorithm, List the category of routing protocols.
  - Explain in brief Fragmentation.
  - Explain in detail three way handshake in TCP.
- Q5)** Solve any two of the following. **[7 each]**
- List and explain the Approaches to control the congestion.
  - Explain IGMP messages.
  - Explain Socket system calls.