CBCS SCHEME

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18EC61

Sixth Semester B.E. Degree Examination, July/August 2022
Digital Communication

Time: 3 hrs. Max. Marks: 100

Note : ***Answer any FIVE full questions, choosing ONE full question from each module.***

Module-1

1 a. What are the applications of Hilbert transform? Prove that a signal g(t) and its Hilbert transform $\hat{g}(t)$ are orthogonal over the entire time interval $(-\infty, \infty)$. **(08 Marks)**

b. For a binary sequence 0 1 0 0 0 0 0 0 0 1 0 1 1 construct :
i) RZ Bipolar format ii) Manchester format iii) B3ZS format iv) B6ZS format
v) HDB3 format. **(08 Marks)**

c. Define Pre-envelope of a real valued signal. Given a band pass signal S(t), sketch the amplitude spectra of signal S(t), Pre-envelope $S_+(t)$ and Complex envelope $\tilde{S}(t)$. **(04 Marks)**

OR

2 a. Express Bandpass signal S(t) in canonical form. Also explain the scheme for deriving the in-phase and quadrature components of the band pass signal S(t). **(08 Marks)**

b. Derive the expression for the complex low pass representation of band pass systems. **(08 Marks)**

c. Write a note on HDBN signaling. **(04 Marks)**

Module-2

3 a. Explain the geometric representation of set of M energy signals as linear combination of N orthonormal basis functions. Illustrate for the case N = 2 and M = 3 with necessary diagrams and expressions. **(10 Marks)**

b. Explain the Correlation receiver using product integrator and matched filter. **(10 Marks)**

OR

4 a. Using the Gram – Schmidt Orthogonalization procedure, find a set of orthonormal basis functions to represent the three signals $S_1(t)$, $S_2(t)$ and $S_3(t)$ shown in Fig. Q4(a). Also express each of these signals in terms of the set of basis functions. **(12 Marks)**

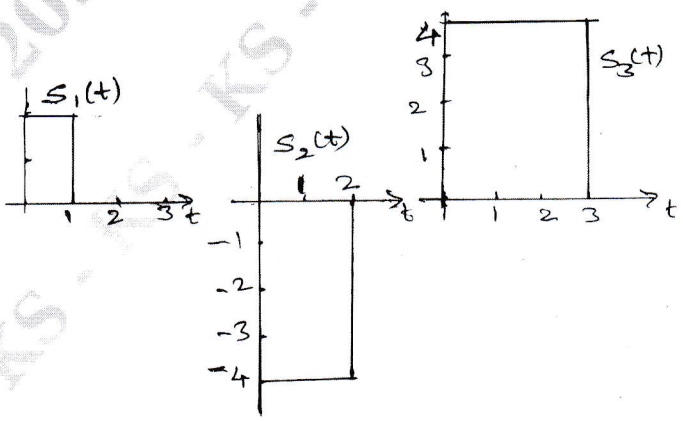

Fig. Q4(a)

b. Show that for a noisy input, the mean value of the j^{th} correlator output X_j depends only on S_{ij} and all the correlator outputs X_j, j = 1, 2, ...N have a variance equal to the PSD $\frac{N_0}{2}$ of the additive noise process W(t). **(08 Marks)**

Module-3

5 a. Derive the expression for error probability of binary PSK using coherent detection. **(06 Marks)**

b. Explain the generation and optimum detection of differential phase – shift keying, with neat block diagram. **(08 Marks)**

c. A binary data is transmitted over a microwave link at a rate of 10^6 bits/sec and the PSD of noise at the receiver is 10^{-10} watts/Hz. Find the average carrier power required to maintain an average probability of error $P_e \leq 10^{-4}$ for coherent binary FSK. What is the required channel bandwidth? (Given erf (2.6) = 0.9998). **(06 Marks)**

OR

6 a. With a neat block diagram, explain the non – coherent detection of binary frequency shift keying technique. **(08 Marks)**

b. In a FSK system, following data are observed. Transmitted binary data rate = 2.5×10^6 bits/second PSD of zero mean AWGN = 10^{-20} Watts/Hz. Amplitude of received signal in the absence of noise = 1μV. Determine the average probability of symbol error assuming coherent detection. (Given erf (2.5) = 0.99959). **(08 Marks)**

c. What is the advantage of M – ary QAM over M – ary PSK system? Obtain the constellation of QAM for M = 4 and draw signal space diagram. **(04 Marks)**

Module-4

7 a. With a neat block diagram, explain the digital PAM technique through band limited base band channels. Also obtain the expression for inter symbol interference. **(08 Marks)**

b. State and prove Nyquist condition for zero ISI. **(08 Marks)**

c. With neat diagram and relevant expression, explain the concept of adaptive equalization. **(04 Marks)**

OR

8 a. For a binary data sequence $\{d_n\}$ given by 1 1 1 0 1 0 0 1. Determine the precoded sequence, transmitted sequence, received sequence and the decoded sequence. **(06 Marks)**

b. Draw and explain the time – domain and frequency domain of duo – binary and modified duo binary signal. **(08 Marks)**

c. With neat diagram, explain the timing features pertaining to eye diagram and its interpretation for base band binary data transmission system. **(06 Marks)**

Module-5

9 a. Explain the model of a Spread Spectrum digital Communication system. **(08 Marks)**

b. Explain the effect of dispreading on a narrow band interference in Direct Sequence Spread Spectrum System (DSSS). A DSSS signal is designed to have the power ratio P_R/P_N at the intended receiver is 10^{-2}. If the desired $E_b/N_0 = 10$ for acceptable performance determine the minimum value of processing gain. **(08 Marks)**

c. What is a PN sequence? Explain the generation of maximum length (ML – Sequence). What are the properties of ML sequences? **(04 Marks)**

OR

10 a. With a neat block diagram, explain frequency Hopped Spread Spectrum Technique. Explain the terms Chip rate , Jamming Margin and Processing gain. **(10 Marks)**

b. With a neat block diagram, explain the CDMA System based on IS - 95. **(10 Marks)**

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18EC62

Sixth Semester B.E. Degree Examination, July/August 2022
Embedded Systems

Time: 3 hrs. Max. Marks: 100

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1 a. With a block Schematic, explain the function of various units in ARM cortex M3 processor architecture, in brief. **(10 Marks)**

b. Explain any 5 application of ARM cortex M3 based on its features. **(05 Marks)**

c. With diagram, explain 2 operation modes and 2 privilege levels in cortex M3, when exceptions are to be handled. **(05 Marks)**

OR

2 a. With tables, describe the various interrupts and exception along with the vector addresses. **(10 Marks)**

b. Explain Program Status Registers (PSRs) in cortex M3 along with the 2 instructions used for accessing PSRS, with a diagram. **(05 Marks)**

c. Describe the reset sequence with a diagram. **(05 Marks)**

Module-2

3 a. Explain the 16 bit instructions: CMP, ASR, SBC and LDMIA, with an example for each. **(08 Marks)**

b. Describe signed and unsigned saturation instructions with diagram and examples. **(08 Marks)**

c. Explain IT instruction with an example to convert a High level language instruction to its equivalent assembly instructions in cortex M3. **(04 Marks)**

OR

4 a. Explain the following 32 bit instructions with an example for each : ADC, BFC, LSL and PUSH. **(08 Marks)**

b. Describe CMSIS with diagram and its functions, organization and scope. **(08 Marks)**

c. Write an ALP to add the first 10 integer numbers using cortex M3 processor. **(04 Marks)**

Module-3

5 a. Describe the elements of an embedded system with a block diagram. **(10 Marks)**

b. Classify the embedded systems based on the complexities and give 2 examples for each category. **(06 Marks)**

c. Differentiate between RISC and CISC architectures. **(04 Marks)**

OR

6 a. Describe the functions of Optocoupler, I2C and IrDA for embedded system. **(10 Marks)**

b. Explain EPROM, EEPROM, FLASH, DRAM, NVRAM and Sensors required for embedded systems. **(06 Marks)**

c. Differentiate between Embedded and general computing systems. **(04 Marks)**

Module-4

7 a. Describe coin operated telephone system with a FSM, function of states and state transition diagram. **(08 Marks)**

b. Explain any 5 characteristics of embedded systems. **(05 Marks)**

c. With a block schematic, explain the ALP based embedded firmware design with its disadvantages. **(07 Marks)**

OR

8 a. Describe the sequential program model for seat belt warning system along with the operation of the system. **(08 Marks)**

b. Explain any 5 operational quality attributes of embedded systems. **(05 Marks)**

c. With a functional block diagram, explain the working of a washing machine. **(07 Marks)**

Module-5

9 a. With the state transition diagram, structure of a process and memory organization, explain the functions of status and the scheduler function for process management. **(10 Marks)**

b. With an example, describe preemptive SJF scheduling and calculate all the performance factors. **(10 Marks)**

OR

10 a. Describe out-of-circuit programming and In-system-programming. **(10 Marks)**

b. With a block diagram, explain the embedded system development environment with the functions of the components used in brief. **(10 Marks)**

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18TE62

Sixth Semester B.E. Degree Examination, July/August 2022
Microwave Theory and Antennas

Time: 3 hrs. Max. Marks: 100

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1 a. Define Reflection Coefficient. Obtain an expression for the same. **(08 Marks)**

b. Discuss Mechanism of Oscillations in Reflex Klystron with schematic diagram. **(08 Marks)**

c. A Reflex Klystron operates at 8 GHz with DC beam voltage 300V , Repeller space 1mm for $1\frac{3}{4}$. Calculate $P_{R(F)\,max}$ and corresponding repeller voltage for a beam current of 18mA. **(04 Marks)**

OR

2 a. Derive expression for attenuation and phase constants , wavelength and velocity of propagation in a transmission line. **(10 Marks)**

b. A transmission line working at RF has L = 9 μH/m , C = 16 PF/m. The line is terminated in a resistive load of 1000Ω. Find the reflection co-efficient and standing wave ratio. **(05 Marks)**

c. What is a Smith Chart? Mention any four applications. **(05 Marks)**

Module-2

3 a. Explain the properties of S - Parameters. **(10 Marks)**

b. Draw the diagram of Magic – Tee. Derive S – matrix of Magic - Tee. **(10 Marks)**

OR

4 a. Explain the losses in S - Parameters. **(10 Marks)**

b. Write a note on Microwave Attenuator. **(04 Marks)**

c. For a two port network with mismatched load derive an expression for input reflection co-efficient. **(06 Marks)**

Module-3

5 a. Discuss different type of losses in micro strip lines. **(06 Marks)**

b. A radio link has a 15W transmitter connected to an antenna of $2.5m^2$ effective aperture at 5 GHz. The receiving antenna has an effective aperture of $0.5m^2$ and is located at 15km line of sight distance from the transmitting antenna. Assume lossless antennas. Find the power delivered to the receiver. **(04 Marks)**

c. Define the following terms with respect to antennas : i) Antenna bandwidth ii) Beam Area iii) Radiation Intensity iv) Beam efficiency v) Directivity. **(10 Marks)**

OR

6 a. Briefly explain : i) Parallel Strip lines ii) Coplanar Strip lines. **(10 Marks)**

b. Prove that directivity of a source with unidirectional pattern of $U_m \cos^n \theta$. Where 'n' can be any number. Can be expressed as D = 2(n+1). **(10 Marks)**

Module-4

7 a. Derive an array factor expression in case of linear array of 'n' isotropic point sources of equal amplitude and spacing. **(10 Marks)**

b. Derive an expression for Radiation resistance of short electric dipole. **(10 Marks)**

OR

8 a. Obtain field expression of two isotropic point sources of equal amplitude, but opposite in phase. **(10 Marks)**

b. Illustrate the principle of Pattern multiplication with suitable example. **(10 Marks)**

Module-5

9 a. What are Horn Antennas? Explain different types of Horn Antennas. **(10 Marks)**

b. Discuss the Antenna types :
i) Helical Antenna ii) Yagi – uda - array. **(10 Marks)**

OR

10 a. Obtain the expression for radiation resistance of Small Loop Antenna. **(10 Marks)**

b. With neat diagram, explain the operation of Log – Periodic Array. **(10 Marks)**

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18EC63

Sixth Semester B.E. Degree Examination, July/August 2022
Microwave and Antennas

Time: 3 hrs. Max. Marks: 100

Note: ***Answer any FIVE full questions, choosing ONE full question from each module.***

Module-1

1 a. Making use of functional block diagram explain the working of reflex Klystron oscillator. Also discuss modes of oscillation. **(10 Marks)**

b. A transmission line has the following parameters, R = 2Ω, G = 0.5mho/m, f = 1GHz, L = 8nH/m, C = 0.23PF.
Calculate :
i) Characteristic impedance
ii) Propagation constant. **(04 Marks)**

c. List the characteristics of smith chart. **(06 Marks)**

OR

2 a. A reflex Klystron is to be operated at frequency of 10GHz, with DC beam voltage 300V, repeller space 0.1cm for 1 mode, calculate P_{RFMax} and corresponding repeller voltage for a beam current of 20mA. **(04 Marks)**

b. Derive the equation of transmission line with possible solution. **(10 Marks)**

c. A certain transmission line has the characteristics impedance of 75 + j0.01Ω and is terminated in a load impedance of 70 + j50Ω.
Compute :
i) The reflection coefficient
ii) Transmission coefficient
iii) Standing wave ratio. **(06 Marks)**

Module-2

3 a. Prove that impedance and admittance matrices are symmetrical for a reciprocal junction. **(05 Marks)**

b. List the characteristics of magic – T when all the ports are terminated with matched load. Also derive the expression of S-matrix for magic T. **(10 Marks)**

c. In a H-plane T junction compute power delivered to the loads of 40Ω and 60Ω connected to arms 1 and 2 when a 10mW power is delivered to the matched port 3. **(05 Marks)**

OR

4 a. Derive the S-matrix representation for multiport network. Also define the losses interms of S-parameters. **(08 Marks)**

b. Explain briefly precision type variable attenuator. **(05 Marks)**

c. What are waveguide tees? Explain its basic types with neat diagram. **(07 Marks)**

Module-3

5 a. A lossless parallel strip line has a conducting strip width 'w'. The substrate dielectric separating the two conducting strips has a relative dielectric constant of 6(beryllium oxide) and thickness 'd' of 4 meter. Calculate :
   i) The required width 'w' of the conducting strip in order to have a characteristic impedance of 50Ω.
   ii) Strip line capacitance
   iii) Strip line inductance
   iv) Phase velocity. **(08 Marks)**

b. Explain the following terms related to antenna system :
   i) Directivity
   ii) Beam area
   iii) Radiation pattern. **(06 Marks)**

c. Determine the directivity of the system if radiation intensity is given by $U = U_m \text{ Sin } \theta \sin^2\phi$ using Exact method. Given that $0 \le \theta \le \pi$ and $0 \le \phi \le \pi$. **(06 Marks)**

OR

6 a. A microwave relay link is to be designed such a way that the transmitting and receiving antennas are separated to 30 statute miles. The directive gains of both the antennas are equal to 45db. Assuming both antennas are lossless and matched at 3GHz. Find what power is transmitted by the transmitter to have received power of 1MW. **(06 Marks)**

b. Explain briefly losses in micro–strip line. **(06 Marks)**

c. Calculate the directivity of the source with pattern $U = U_m \sin \theta^2 \sin^3\phi$ using :
   i) Exact method
   ii) Approximate method, where $0 \le \theta \le \pi$ and $0 \le \phi \le \pi$. **(08 Marks)**

Module-4

7 a. Obtain the field pattern for two point source situated symmetrically with respect to the origin. Two sources are feed with equal amplitude and equal phase signals, assume distance between two sources is $\frac{\lambda}{2}$. **(10 Marks)**

b. Make use of poynthing theorem derive the expression for radiation resistance of short dipole with uniform current. **(10 Marks)**

OR

8 a. Derive an array factor expression in case of linear array of 'n' isotropic point sources of equal amplitude and spacing. **(10 Marks)**

b. Starting from electric and magnetic potential, obtain the far field components for short dipole. **(10 Marks)**

Module-5

9 a. Derive the far field expression for small loop antenna. **(08 Marks)**

b. Explain the constructional details for following antenna :
   i) Yogi – uda array
   ii) Parabolic reflector. **(12 Marks)**

OR

10 a. Derive the expression for radiation resistance of loop antenna. **(10 Marks)**

b. Find the length L, H-plane aperture and flare angle θ_E and θ_H of pyramidal horn for which E –plane operators is 10λ horn is fed by a rectangular waveguide with TE_{10} mode. Assume $\delta = 0.2\lambda$ in E – plane and 0.375λ in H – plane. Also find E – plane, H – plane beam widths are directivity. **(10 Marks)**

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18TE63

Sixth Semester B.E. Degree Examination, July/August 2022
Computer Communication Networks

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Explain the functions of each layer in TCP/IP protocol stack with a neat diagram. **(08 Marks)**

b. Outline four levels of addressing used in Internet (TCP/IP) with examples. **(08 Marks)**

c. An image with 1024×768 pixels has 3 bytes/pixels. Assume image is uncompressed. Solve for transmission time for (i) 56 kbps modem channel. (ii) 1 Mbps cable modem and (iii) 10 Mbps Ethernet **(04 Marks)**

OR

2 a. Compare various physical topologies in a computer network. List the advantages and disadvantages of each topology. **(06 Marks)**

b. Explain the five components involved in data communication. Illustrate encapsulation and decapsulation for TCP/IP model. **(06 Marks)**

c. Explain the following connecting devices (i) Hub (ii) Link layer switch (iii) Router (iv) Gateway **(08 Marks)**

Module-2

3 a. Apply the bit stuffing and destuffing in the given bit stream : 000111111100111110100O. Assume flag as 01111110. **(04 Marks)**

b. Explain ARP operation and a ARP packet format with a neat diagram. **(08 Marks)**

c. Explain with suitable diagram stop and wait protocol considering acknowledgement, timer and sequence number with flow diagram. **(08 Marks)**

OR

4 a. Compare Random access protocols:
(i) Pure ALOHA and Slotted ALOHA.
(ii) I-Persistent, P-Persistent, n-Persistent CSMA.
(iii) CSMA/CD and CSMA/CA **(08 Marks)**

b. Two stations A and C are connected to a shared channel with data rate of 10 Mbps. The distance between station A and C is 200 mm and the propagation speed is 2×10^8 m/s. Station A starts sending a long frame at time $t_1 = 0$. Station C starts sending a long frame at $t_2 = 3$ µs. The size of the frame is long enough to guarantee the detection of collision by both stations. Solve for : (i) The time when station C hears the collision (t_3) (ii) The time when station A hears the collision (t_4) (iii) The number of bits station A has set before detecting the collision. The number of bits station C has sent before detecting the collision. **(06 Marks)**

c. Explain Reservation, Polling and Token passing is controlled access method. **(06 Marks)**

Module-3

5 a. An organization is granted a block of addresses starting with 14.24.74.0/24. The organization wants to distribute these to 3 sub blocks of addresses in their subnets. One sub block needs 10 addresses, one sub block needs 60 addresses and one sub block needs 120 addresses. Design the sub blocks and give the slash notation for each subblock. Find how many addresses are available after these allocations. **(08 Marks)**

b. Explain DHCP packet format with a neat diagram. **(06 Marks)**

c. Classify the occupation of address space in classful addressing. **(06 Marks)**

OR

6 a. Explain IPV4 fields for the given data 45 00 00 44 ad 0b 00 00 40 11 72 72 ac 14 02 fd ac 14 00 06. Also calculate and verify the checksum. **(08 Marks)**

b. Build the routing table for node c in the given network using link state algorithm. Show step wise progress of the table's tentative and confirmed list with explanation. **(06 Marks)**

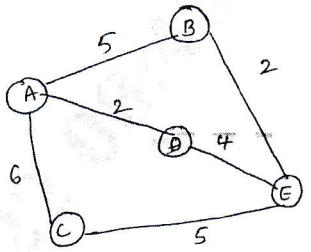

Fig. Q6 (b)

c. Show the 3 phases of remote host and mobile host communication. **(06 Marks)**

Module-4

7 a. Explain Go back 'n' protocol and its operation with flow diagrams. **(08 Marks)**

b. Explain flow control and error control in TCP. How sending and receiving windows are used in TCP. **(06 Marks)**

c. Write short notes on (i) Pipelining (ii) Piggbacking **(06 Marks)**

OR

8 a. Draw TCP segment structure and explain. **(08 Marks)**

b. Explain Three way handshaking for connection establishment and termination in TCP. **(08 Marks)**

c. Compare TCP and UDP protocols. **(04 Marks)**

Module-5

9 a. Illustrate the working of leaky bucket algorithm with the help of a diagram. **(06 Marks)**

b. Explain scheduling algorithms designed to improve QoS. **(08 Marks)**

c. Explain the features and operations of FTP. **(06 Marks)**

OR

10 a. What is DNS? Differentiate between recursive and iterative queries. Explain the formats of the query and response messages used in DNS. **(08 Marks)**

b. Explain the architecture of e-mail with diagram. **(06 Marks)**

c. Explain persistent and non persistent HTTP connections with flow diagrams. **(06 Marks)**

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18EC641

Sixth Semester B.E. Degree Examination, July/August 2022
Operating System

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Define operating system. Explain the goals of an operating system. **(10 Marks)**

b. What are Computational structures? Explain the operation of an operating system. **(10 Marks)**

OR

2 a. Explain:
i) Partition based
ii) Pool based resource allocation strategies with a neat diagram. **(10 Marks)**

b. Briefly explain the different classes of operating system, specifying the primary concern and key concepts used. **(10 Marks)**

Module-2

3 a. Explain the fundamental state transition for a process with state transition diagram. **(10 Marks)**

b. For the following set of process perform FCFS and SRN scheduling. Calculate mean turn around time and mean weighted turn around.

Process	P_1	P_2	P_3	P_4	P_5
Arrival time	0	2	3	5	9
Service time	3	3	2	5	3

(10 Marks)

OR

4 a. Define threads. Explain: i) User – level threads ii) Kernel level threads. **(10 Marks)**

b. For the following set of process perform RR and LCN scheduling. **(10 Marks)**

Process	P_1	P_2	P_3	P_4	P_5
Arrival time	0	2	3	5	9
Service time	3	3	2	5	3

Module-3

5 a. Explain contiguous and non contiguous memory allocation. **(10 Marks)**

b. Explain: i) Paging ii) Segmentation. **(10 Marks)**

OR

6 a. Explain the important concepts in the operation of demand paging with diagram. **(10 Marks)**

b. For the following page reference string apply FIFO and LRU page replacement policies to find number of page faults. Use alloc = 4.
Page reference string: 5, 4, 3, 2, 1, 4, 3, 5, 4, 3, 2, 1, 5
Reference time string: t_1, t_2, t_3, t_4, t_5, t_6, t_7, t_8, t_9, t_{10}, t_{11}, t_{12}, t_{13}.

(10 Marks)

Module-4

7 a. Explain the different file operations performed by processes. (10 Marks)
b. Explain the interface between file system and IOCS. (10 Marks)

OR

8 a. Explain the working of linked allocation of disk space with a figure. (10 Marks)
b. Explain implementing file access with neat figure. (10 Marks)

Module-5

9 a. Explain the primary issues in implementing message passing. (10 Marks)
b. Explain the working of blocking and non-blocking delivery protocols. (10 Marks)

OR

10 a. Define dead lock. Explain the condition of dead lock in resource allocation. (10 Marks)
b. Explain the three fundamental approaches used in dead lock handling. (10 Marks)

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CBCS SCHEME

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18EC646

Sixth Semester B.E. Degree Examination, July/August 2022
Python Application Programming

Time: 3 hrs. Max. Marks: 100

Note: ***Answer any FIVE full questions, choosing ONE full question from each module.***

Module-1

1 a. Explain Conditional Execution , Alternative execution , Chained conditionals and Nested conditionals with examples. **(08 Marks)**

b. Explain the rules of precedence used by Python to evaluate an expression. **(04 Marks)**

c. Write a Python Program to prompt the user for hours and rate per hour for pay computation with time and a half for overtime. To give the employee 1.5 time the hourly rate for hours worked above 40 hours. **(08 Marks)**

OR

2 a. List the features of Python Programming Language (at least FIVE). **(05 Marks)**

b. What are User defined functions? How can we pass parameters in user defined functions? Explain with suitable example. **(06 Marks)**

c. Write a program to prompt for a score between 0.0 and 1.0. if the score is out of range print an error manage and exit. If the score is between 0.0 and 1.0 print a grade using the following table : **(09 Marks)**

Score	>= 0.9	>= 0.8	>= 0.7	>= 0.6	< 0.6
Grade	A	B	C	D	F

Module-2

3 a. With Syntax, explain the finite and infinite looping constructs in Python. What is the need for break and continue statements? Explain with examples. **(08 Marks)**

b. What are String Slices? Explain the Slicing Operator in Python with examples. **(05 Marks)**

c. Write a Python program to accept a file name from the user :
i) Display the number of characters in the file.
ii) Find the frequency of occurrence of the lines which started with a word 'From'. **(07 Marks)**

OR

4 a. List and explain any four built in string manipulation functions supported by Python with examples. **(06 Marks)**

b. Explain file open , file close , file read and file write concepts in Python with examples. **(08 Marks)**

c. Write a Python program to find the largest value from the given set of accepted values. **(06 Marks)**

Module-3

5 a. Lists are mutable. Justify the statement with examples. Discuss the list handling functions in Python with examples. **(08 Marks)**

b. Differentiate between List and Dictionary. **(04 Marks)**

c. Write a Python program to search lines that start with the word 'from' and a character followed by a two digit number between 00 and 99 followed : Print the number if it greater than zero. Assume any input file. **(08 Marks)**

OR

6 a. Compare and contrast tuples with tests. Explain the following operation in tuples with examples : i) Sum of two tuples ii) Slicing operations iii) Compression of two tuples iv) Assignment to variables. **(10 Marks)**

b. Write a Python program that accept a sentence and build dictionary with LETTERS , DIGITS , UPPERCASE , LOWERCASE as key values and their count in sentence as values. **(06 Marks)**

c. Explain the need of Regular expression in Python language, with an example. **(04 Marks)**

Module-4

7 a. Explain Classes and Attributes in Python language with examples. **(06 Marks)**

b. What is the difference between Method and Function? Explain the working of init method with suitable code. **(06 Marks)**

c. Write a function named move – rectangle that takes a Rectangle and two numbers named dx and dy. It should change the location of the rectangle by adding dx to the x co-ordinate of corner and adding dy to the y co-ordinate of corner. **(08 Marks)**

OR

8 a. Show using a Python code how_ str_ method is invoked when you print an object. Explain its working. **(06 Marks)**

b. Illustrate the concept of Pure function and Modifier with examples. **(06 Marks)**

c. What is Operator Overloading? Write Python code to overload "+" , "-" and "*" operator by providing the methods _ _ add_ _ , _ _ sub _ _ and _ _ mul _ _. **(08 Marks)**

Module-5

9 a. Define Socket. Explain how socket connection can be established to the internet using Python code over the TCP/IP connection and the http protocol to get the web document. **(08 Marks)**

b. Compare and Contrast the Javascript Object Notation (JSON) and XML. Explain parsing of XML with example. **(06 Marks)**

c. Define Cursor. Explain Connect, Execute and Close command of databases with a snippet code. **(06 Marks)**

OR

10 a. What is Embedded SQL? Explain the importance of SQLite data base. **(04 Marks)**

b. Write a note on Google Geo coding Web service. Using Python supported libraries demonstrate with a snippet code. **(08 Marks)**

c. Write a Python code to read the file from web using urllib and retrieve the data of the file. Also compute the frequency of each word in the file. **(08 Marks)**

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