Roll No. ..... Total Pages : 4

BSIT/D-19 **12661**

Communication Skills English) F

Paper - BSIT-101

Time allowed : 3 Hours *Maximum Marks : 40*

Note : A student is required to attempt **five** questions in all. Question No. **1** is compulsory. All questions carry equal marks.

1. (i) What is Draft ? Write the essentials of a good draft.
   (ii) Write a short note on Fax.
   (iii) Discuss the difference between formal and informal communication.
   (iv) Short note on Face to Face Communication.
   (4×2=8)
2. Write short notes on any two of the followings : (2×4=8)
   (i) Interview
   (ii) Seminar
   (iii) Horizontal Communication
   (iv) Downward Communication
3. Define Communication, its types and a note on verbal communication. 8

   OR

   What is meant by term communication ? Explain its types.

4. Write short notes on any two of the following (2×4=8)
   (i) Memorandum
   (ii) Endorsement
   (iii) Meaning of official correspondence
   (iv) Classification of official correspondence
5. Write short notes of any two of the following : (2×4=8)
   (i) Telegram
   (ii) Notification
   (iii) Employee Manuels
   (iv) Resume Writing

(b) Six friends on a tour found that they have a total of Rs. 7,206 with then. Show that at least one of them has minimum Rs. 1.201. 4

9. (a) If p and q are two statements, then prove that

$$\sim(p \vee q) \equiv (\sim p) \wedge (\sim q).$$ 4

(b) Let $f : R \to R$ be a function defined by $f(x) = 4x - 3$. Find inverse of f. 4

Roll No. ..... Total Pages : 4

BSIT/D-19 **12662**

MATHEMATICS

(Mathematical Foundations for Information Technology–I)

Paper–BSIT–102

Time Allowed : 3 Hours] [Maximum Marks : 40

Note : Attempt **five** questions in all, selecting at least **one** question from each Unit. Question No. **1** is compulsory. All questions carry equal marks.

Compulsory Question

1. (a) Find characteristic equation of the matrix

$$A = \begin{bmatrix} 2 & 1 & 1 \\ 1 & 2 & 3 \\ 2 & 1 & 2 \end{bmatrix}.$$ 2

(b) Solve the differential equation

$$\frac{d^4y}{dx^4} - \frac{d^3y}{dx^3} - 9\frac{d^2y}{dx^2} + 11\frac{dy}{dx} - 4y = 0.$$ 2

(c) If $A = \{1, 2, 3, 4\}$, $B = \{2, 4, 7, 9\}$ prove that $A - B \neq B - A$. 2

(d) Is $\{\{1, 2, 3\}, \{4, 5\}, \{6, 7\}\}$ a partition of the set $U = \{1, 2, 3, ..., 9\}$? 2

UNIT–I

2. (a) Using elementary operations, find inverse of the matrix

$$A = \begin{bmatrix} 1 & 3 & 2 \\ 0 & 4 & 1 \\ 5 & 2 & 3 \end{bmatrix}.$$ 4

(b) Find the Eigen vectors of the matrix

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 0 & -4 & 2 \\ 0 & 0 & 7 \end{bmatrix}.$$ 4

3. (a) If $A = \begin{bmatrix} 3 & 1 \\ 1 & 2 \end{bmatrix}$, use Cayley-Hamilton theorem to express $2A^5 - 3A^4 + A^2 - 4I$ as a linear polynomial is A. 4

(b) Diagonalize the matrix $\begin{bmatrix} 2 & 1 \\ 2 & 3 \end{bmatrix}$ if possible. 4

UNIT–II

4. (a) Find differential equation of all ellipses centred at origin. 4

(b) Solve the differential equation

$$x(x-1)\frac{dy}{dx} - (x-2)y = x^3(2x-1).$$ 4

5. (a) Solve the differential equation

$$(x^2 - y^2 - 2x)dx - 2y\,dy = 0.$$ 4

(b) Solve the differential equation

$$\frac{d^2y}{dx^2} + y = \sin x \sin 2x.$$ 4

UNIT–III

6. (a) Prove that $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$. 4

(b) Using principle of mathematical induction, prove that $3^{2n+2} - 8n - 9$ is divisible by 64. 4

7. (a) In a group of 65 people, 40 like cricket, 10 like both cricket and tennis. Find how many like tennis. 4

(b) In the set of real numbers, a relation R is defined by aRb if and only if $1 + ab > 0$. Show that R is reflexive, symmetric but not transitive. 4

UNIT–IV

8. (a) If R is a relation in $N \times N$ defined by (a, b) R (c, d) if and only if $a + d = b + c$. Show that R is an equivalence relation. 4

Roll No. ..... Total Pages : 3

BSIT/D-19 **12665**

ELECTRONIC COMMUNICATION–I

Paper–BSIT–105

Time Allowed : 3 Hours] [Maximum Marks : 40

Note : Attempt **five** questions in all, selecting at least **one** question from each Unit. Question No. **1** is compulsory. All questions carry equal marks.

Compulsory Question

1. (a) Why high carrier frequencies are used for transmission ? 2

   (b) Draw the wave form of AM wave for the following values of modulation index.

   (i) 0

   (ii) 0.5

   (iii) 1.5. 2

   (c) What is Compounding ? Why is it used ? 2

   (d) Explain why quantizing noise could affect small-amplitude signals in a PCM system for more than large signals. 2

UNIT–I

2. (a) What do you understand by frequency modulation ? Derive an expression for the F.M. Wave and determine frequency deviation, modulation index, deviation ratio and frequency spectrum of F.M. Wave. 6

(b) What are the advantages and disadvantages of FM over AM ? 2

3. (a) The rms value of a carrier voltage is 150 volts. Compute its rms value when it has been amplitude modulated to a depth :

(i) 30%

(ii) 50%. 4

(b) What is Detector ? Draw the diode detector circuit and explain its operation. 4

UNIT–II

4. (a) Describe sampling theorem for Low-pass signals. 5

(b) For a low pass signal with f_m = 25KHz, what should be the maximum sampling frequency ? 3

5. (a) What is Pulse modulation ? Discuss PAM in detail. 5

(b) What is meant by quantization errors ? Explain its types. 3

UNIT–III

6. (a) Explain why PCM is more noise-resistant than the other forms of pulse modulation. 4

(b) Describe the method of generation of Delta-Modulation. 4

7. (a) State the advantages and applications of pulse code modulation (PCM). 3

(b) Compare delta modulation with PCM and explain the term slope overloading. How can slope overloading be reduced ? 5

UNIT–IV

8. (a) What factors are necessitated while designing a digital communication system ? Explain. 4

(b) What is Echo cancaller device ? What is its use in digital communication system ? 4

9. (a) Explain the terms bit rate, band rate and transmission rate with reference to digital communication. 5

(b) An analog signal carries 16 bits in each signal element. If 10000 signal elements are sent per second, find the band rate and bit rate. 3

(c) Show that

$$\left(x^2 + y^2 - 2x\right)dx - 2y\,dy = 0$$

is not exact.

(d) Find the characteristic root of the matrix

$$\begin{bmatrix} a & h & g \\ 0 & b & f \\ 0 & 0 & c \end{bmatrix}.$$

Roll No. ..... Total Pages : 4

OBSIT/D-19 **12668**

MATHEMATICAL FOUNDATIONS FOR INFORMATION TECHNOLOGY–I

Paper–BSIT-102

Time Allowed : 3 Hours] [Maximum Marks : 40

Note : Attempt **five** questions in all, selecting at least **one** question from each Unit. Question No. **9** is compulsory.

UNIT–I

1. (a) Find the rank of matrix

$$\begin{bmatrix} 9 & 0 & 2 & 3 \\ 0 & 1 & 5 & 6 \\ 4 & 5 & 3 & 0 \end{bmatrix}.$$ 4

(b) Express

$$A = \begin{bmatrix} 1 & 3 & 5 \\ 6 & 8 & 3 \\ 4 & 6 & 5 \end{bmatrix}$$

as a sum of symmetric and skew symmetric matrix. 4

2. (a) Find eigen vector of the matrix

$$A = \begin{bmatrix} 2 & 1 & 0 \\ 0 & 2 & 1 \\ 0 & 0 & 2 \end{bmatrix}.$$ 4

(b) Diagonalize the matrix

$$\begin{bmatrix} 2 & -1 \\ 2 & 0 \end{bmatrix}.$$ 4

UNIT–II

3. (a) Find the differential equation of the system of circles touching x-axis at the origion. 4

(b) Solve $x\frac{dy}{dx} - y = \sqrt{x^2 + y^2}$. 4

4. (a) Solve $\left(1 + y^2\right)dx = \left(\tan^{-1} y - x\right)dy$. 4

(b) Solve $\left(xy^2 - e^{1/x^3}\right)dx - x^2 ydy - 0$. 4

UNIT–III

5. (a) Solve $\frac{d^2y}{dx^2} - y = x^2 \sin x$. 4

(b) Solve $x^2\frac{d^2y}{dx^2} + x\frac{dy}{dx} - y = x^2 e^x$. 4

6. (a) Prove that

$$A \cup (B \cap C) \quad (A \cup B) \cap (A \cup C).$$ 4

(b) Prove that $5^n > 3^n \ \forall\ n \in N$ by P.M.I. 4

UNIT–IV

7. (a) Find the inverse of the function

$$f(x) = 3x + 2.$$ 4

(b) How many people among 2,00,000 people are born at the same time (hour, minute, second) ? 4

8. (a) Find the partitions of the set $\{a, b, c\}$. 4

(b) If R is relation from N to r define by xy is a square determine the relation reflexire, symmetric, transitive. 4

UNIT–V

Compulsory Question

9. Write short notes on the following: 2×4=8

(a) Define equivalence relation.

(b) Find the rank of the matrix

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 3 & 2 & 1 \\ 1 & 1 & 1 \end{bmatrix}.$$

Roll No. ..... Total Pages : 2

OBSIT/D-19 **12669**

PHYSICS-I (EM THEORY)

Paper–**BSIT-103**

Time Allowed : 3 Hours] [Maximum Marks : 40

Note: Question No. **one** is compulsory. Attempt **four** more questions, selecting **one** question from each Unit.

1. (a) Define Vector Potential. 2

   (b) What are gauge transformations? 2

   (c) Write applications of remote sensing. 2

   (d) Define maximum usable frequency and second law. 2

UNIT-I

2. What is electric flux? State and Prove Gauss's Law in Electrostatics. 8

3. (a) State and explain stoke's theorem. 4

   (b) Derive Maxwell's equations in integral form. 4

UNIT-II

4. State Poynting vector. Give its physical significance. Workout to find poynting theorem for the conservation of energy for the electromagnetic field. 8

5. (a) Discuss the Propagation of em waves through a conducting medium. 6

   (b) Explain skin effect. 2

UNIT-III

6. (a) Discuss the ground wave propagation. What is the angle of tilt? How does it affect field strength at a distance from the transmitter? 6

   (b) What is fading? Write its major causes. 2

7. (a) Explain the Satellite communication in brief. Also write some advantages of satellite communication. 5

   (b) Define tropospheric scatter propagation. Also write its properties. 3

UNIT-IV

8. (a) What are different types of transmission lines? 6

   (b) Define field strength of the elementary doublet. 2

9. (a) Define the terms—

   (i) Antenna resistance. 5

   (ii) Bandwidth and Beamwidth.

   (b) How current and voltage are distributed in a dipoll antenna? 3

Roll No. ..... Total Pages : 3

OBSIT/D-19 **12670**

DIGITAL ELECTRONICS-I

Paper--**B.S.I.T.-104**

Time Allowed : 3 Hours] [Maximum Marks : 40

Note: Attempt **five** questions in all selecting one question from each Unit. Question no. **one** is compulsory.

Compulsory Question

1. (a) Explain Radix of a number system.

   (b) Define XNOR gate.

   (c) Discuss the advantages of grey code.

   (d) Write uses of multiplexes. 2×4=8

UNIT-I

2. (a) Convert the following--

   $(1011{\cdot}011)_{10} = (X)_2 = (Y)_8 = (Z)_{16}$ 1½×3=4½

   (b) Perform the following binary addition—

   1101 1101 101 + 110111 + 1101 10·01 1½

   (c) Write the ASCJI Code for decimal number 0 to 9.

3. (a) Explain how grey code is converted to binary and vice versa. 2

(b) Perform the following in 8-bit system using 2's compliment method.

(i) –49–46

(ii) 67–39

(iii) –87+112 2 . 3=6

UNIT-II

4. (a) Using the theorems of Boolean Algebra. Prove the following.

(i) $A\cdot\bar{B} + B\cdot\bar{C} + C\cdot\bar{A} \quad \bar{A}B + \bar{B}C + \bar{C}A$

(ii) $\overline{\overline{A\cdot B} \cdot \overline{\bar{A} + A\cdot B}} \quad 0$ 2+2=4

(b) Obtain the minimal Boolean junction of the following using K-map.

(i) $F_1 (A,B,C,D) = \sum (0, 2, 3, 5, 6, 7, 8, 9) + \sum_{\phi} (10, 11, 12, 13, 14, 15)$

(ii) $F_2 (A,B,C,D) = \sum (2, 9, 10, 12, 13) + \sum_{\phi} (1, 5, 14, 15)$ 2–2=4

5. (a) Explain how AND, OR, NOT gates can be realized using NOR gates alone? 2

(b) Using K-map, obtain the minimal POS expression of the following and implement it with NOR gates only.

$F(A, B, C, D) = \pi (1, 5, 6, 12, 13, 14), \sum_{\phi} (2, 4)$ 6

UNIT-III

6. (a) What is a full subtractor? Discuss the design of a full subtractor using NAND gates. 5

(b) Explain the operation of a 4:1 multiplexer. 3

7. (a) What is a digital comparator? Discuss and design a logic circuit for one bit comparator. 4

(b) What is an encoder? Draw and explain the logic diagram of a decimal to BCD encoder. 4

UNIT-IV

8. (a) What is the difference between asynchronous and synchronous Flip-Flop. Draw and explain clocked R S Flip-Flop with NOR latch. 4

(b) Draw and explain D-Flip-Flop with NAND latch. 4

9. (a) Discuss the operation of a master-slave JK FF. 4

(b) Describe the working of a edge trigger T-Flip-Flop. 4

(b) What is the use of echo suppressors and echo canceller in digital communication system? 2

9. (a) What is a digital communication system? Make a block diagram of the digital communication system showing its various elements. 4

(b) What are the important characteristics of a digital communication system? Discuss briefly. 4

Roll No. ..... Total Pages : 4

OBSIT/D-19 **12671**

ELECTRONICS COMMUNICATION-I

Paper–**BSIT-105**

Time Allowed : 3 Hours] [Maximum Marks : 40

Note: Attempt **five** questions in all, selecting **one** question from each Unit. Question No. **one** is compulsory. All questions carry equal marks.

Compulsory Question

1. (a) What do you mean by the term SSB-SC? Write the advantage of SSB-SC Modulation?

(b) Define the term deviation ratio in Frequency Modulation and give its significance.

(c) What is the fundamental difference between pulse modulation and other modulations like frequency and amplitude modulation?

(d) Define bond rate. Is bond rate always equal to bit rate? If not, why? 2×4=8

UNIT-I

2. (a) Define amplitude modulation and derive an expression for an amplitude modulated carrier wave. 5

(b) Unmodulated RF carrier power of 10 kw sends a current of 10 amperes rms through on antenna. On amplitude modulation by another sinusoidal voltage, the antenna current increases 11.6 amperes. Calculate: 3

(i) The modulation index

(ii) Carrier power after modulation.

3. (a) Define frequency modulation and derive the formula for instantaneous value of an FM voltage and also define the modulation index. 5

(b) In an FM system, the frequency duration is 4 KH_2 when the modulating frequency is 200 H_2 and the modulating voltage is 4V. Comput the modulating index. Also compute the frequency deviation and modulation index if the modulating signal amlitude is increased to 12V and its frequency is decreased to 100 H_2. 3

UNIT-II

4. (a) Define and describe pulse position modulation (PPM) and explain how it is derived from pulse width modulation (PWM). 6

(b) Define Time Division Multiplexing (TDM). Waht is its use in communciation? 2

5. (a) What do you understand by a sample and hold circuit (s/H)? Explain with the help of its circuit, input and output waveforms. 6

(b) What is the fundamental difference between pulse modulation and amplitude modulation? Comment over it. 2

UNIT-III

6. (a) What is pulse code modulation? Explain PCM with the help of quantization process. 6

(b) What are the advantages of PCM, over PAM. 2

7. (a) What do you understand by Differential PCM (DPM)? Explain with the help of circuit diagram, how it is different from PCM? 4

(b) Define granular and slop overload noises in Delta modulation. Make appropriate waveforms exhibiting the above notes. 4

UNIT-IV

8. (a) What is cross talk in digital communication? Suggest the techniques to reduce or eliminate cross talk in communication system. 6

9. (a) give the excitation table for JK flip flop. List the applications of JK flip-flop. 2

(b) Carry out the following conversions— 6

(i) T to RS FF

(ii) RS to D FF

(iii) D to JK FF

Roll No. ..... Total Pages : 4

BSIT/D-19 **12673**

CIRCUIT ANALYSIS AND DIGITAL ELECTRONICS-II

Paper–BSIT-301

Time Allowed : 3 Hours] [Maximum Marks : 40

Note: Attempt **five** questions in all, selecting **one** question from each Unit. Question No. **one** is compulsory.

1. (i) Why in RS flip-flop, the state RS=II is prohibited?

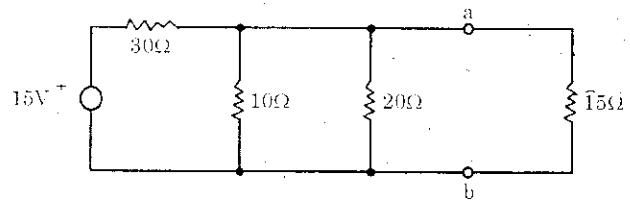
(ii) Which Kirchoff's Law is based on the conservation of charge? Justify.

(iii) Define setup time and Maximum clock frequency for flip-flops.

(iv) Superposition theorem is based on the concept of linearly or non-linearly principle. Justify. $2 \times 4 = 8$

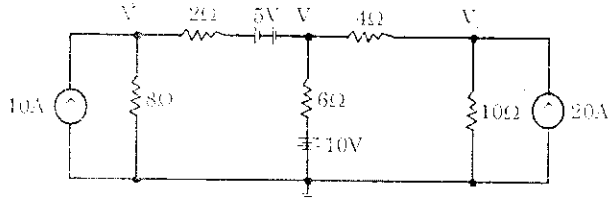
UNIT-I

2. (a) Find current I_2 through 15Ω resistor in following circuit— 4



(b) What is the principle of superposition theorem and list the conditions of applicability on which it can be applied? 4

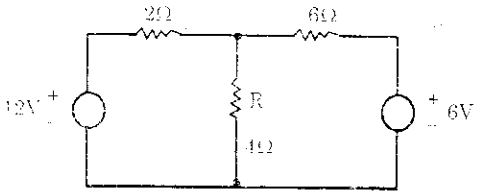
3. (a) Find the voltages V_1, V_2 and V_3 in the following network using Node analysis method— 5



(b) Explain the technique to convert a star connection to delta connection. 3

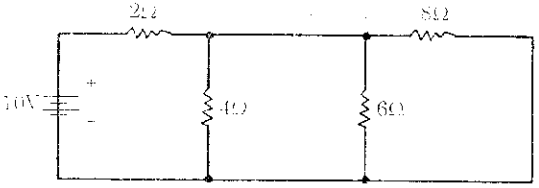
UNIT-II

4. (a) Find current through 4Ω resistor (R) in the following circuit using Norton's theorem— 4



(b) State the prove Milliner's theorem. 4

5. (a) Verify the Reciprocity theorem in the circuit—



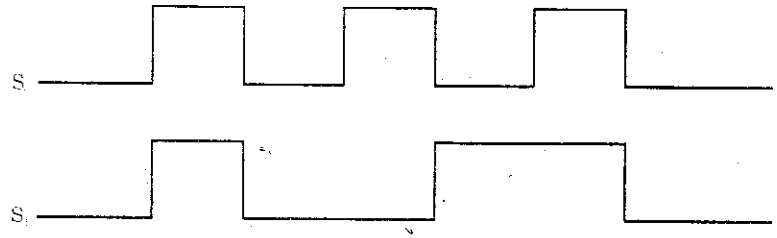
4

(b) State and prove maximum power transfer theorem for D.C. networks. 4

UNIT-III

6. (a) What is code convertor? Design 4-bit binary to gray code convertor. 4

(b) What is multiplexer. In a 4:1 multiplexer, if four data inputs are as D_0=O; P_1=1, D_2=0, D_3=0. Find the waveform if select signals are as shown below— 4



7. (a) What is full subtracter? Discuss the design of full subtracter using NOR gates only. 4

(b) Define Demultiplexing. Design a 1:8 demultiplexer using AND, OR and NOT gates. 4

UNIT-IV

8. (a) Differentiate between asynchronous and synchronous flip-flop? 4

(b) What do you mean by level trigger flip-flop? How is it differ from an edge trigger flip-flop? 4

Roll No. ..... Total Pages : 2

BSIT/D-19 **12675**

TELECOMMUNICATION & NETWORKING-I

Paper–**BSIT-303**

Time Allowed : 3 Hours] [Maximum Marks : 40

Note: Question No. **one** is compulsory. Attempt **five** questions in all, selecting **one** from each Unit.

Compulsory Question

1. (a) Give the formula that finds the number of cable links necessary for mesh network topology and number of ports for each device. 2

   (b) Explain the function of TSI in time division switch. 2

   (c) What are the merits and demerits of LAN topologies? 2

   (d) How does NNI differ from a UNI? 2

UNIT-I

2. Explain different type of topologies used in networking with their advantages and disadvantages. 8

3 (a) Explain telephone structure for a medium distance call. 4

   (b) What is FDM? What are their advantages over TDM? 4

UNIT-II

4. (a) What is ISDN and its services? Explain the interfaces of ISDN. 4

   (b) What is time division switching? Explain TDM bus. 4

5 (a) What are the disadvantages of Cross Bar Switch? How it can be improved in multistage switching? 4

   (b) Explain ISDN System with PBX. 4

UNIT-III

6. Explain the working of layers present in TCP/IP model. 8

7. (a) Explain Client to Server network model in networking. 4

   (b) In OSI and TCP/IP models, which one is preferred and why? 4

UNIT-IV

8. (a) How Frame Relay assembler/disassembler (FRADs) used in a frame relay? 4

   (b) Explain different types of switches used in ATM. 4

9. (a) Explain the functions of Frame Relay layers. 4

   (b) Explain the architecture of ATM. 4

Roll No. ..... Total Pages : 3

BSIT/D-19 **12677**

OPERATING SYSTEM-I

Paper–BSIT-305

Time Allowed : 3 Hours] [Maximum Marks : 40

Note: Attempt **five** questions in all. Question no. **one** will be compulsory. In addition to compulsory question, select at least one question from each Unit.

Compulsory Question

1. (a) What is process? How it is different from thread?

   (b) Why there is a need to synchronize processes?

   (c) What do you mean by critical section?

   (d) Name the methods for handling deadlocks. $4 \times 2=8$

UNIT-I

2. What is operating system? Describe evolution of operating system. 8

3 Compare and contrast Multiprogramming. Multi-tasking and Multiprocessing. 8

UNIT-II

4. How preemptive scheduling is different from non-preemptive scheduling? Give one example of each type. 8

5 Consider the following set of processes with the length of CPU burst time given in milliseconds.

Process	Burst Time	Priority
P1	10	3
P2	2	3
P3	1	1
P4	5	2
P5	4	4

The processes are assumed to be arrived in order P1, P2, P3, P4 and P5. Explain.

(i) FCFS

(ii) SJF

(iii) RR

(iv) Priority Scheduling.

Take a time quantum of 1. 8

UNIT-III

6. Describe two classical problems of synchronization along with their solutions in detail. 8

7. Explain the producer consumer problem with example. 8

UNIT-IV

8. List and explain four necessary conditions for deadlock to occur? Explain different algorithms for prevention and avoidance of deadlocks. 8

9. What is deadlock? Describe the graphical representation of dead locks. 8

Roll No. ..... Total Pages : 2

BSIT/D-19 **12678**

COMPUTER PROGRAMMING WITH C-I

Paper–**BSIT-306**

Time Allowed : 3 Hours] [Maximum Marks : 40

Note: Question No. **one** is compulsory and students are required 5 questions in all selecting one question from each Unit. All question equal marks.

Compulsory Question

1. Attempt any four: 4×2=8

   (a) Define the term (i) identifier (ii) token.

   (b) State the use of break and continue statement.

   (c) State two differences between while loop and do while loop.

   (d) State the advantage of functions.

   (e) Character set.

UNIT-I

2. What is a data type? Explain different data types in detail with examples. 8

3. (a) Write a program to check whether a given number even or odd. 2×4

   (b) Explain selection statements in C.

UNIT-II

4. Explain the various Operators in detail. 8

5. Explain various IF statements with suitable examples. 8

UNIT-III

6. Explain how 'switch' statement is used in the programs instead of 'if-else' statements with a suitable example program. 8

7. Write a C program to count the number of characters and print the vowels present in entered text. 8

UNIT-IV

8. Explain the following with suitable example: 4×2

   (a) getchar(),

   (b) getche(),

   (c) getch(),

   (d) putchar().

9. What is array? And explain 1-D and 2-D array using some suitable example. 8

(b) Evaluate

$$\lim_{x \to 0} \frac{1}{x^2} - \frac{1}{\sin^2 x}$$ 4

UNIT–V

Compulsory Question

9. Write short notes on the following: 2×4=8

(a) Define Gamma function.

(b) Define Bing.

(c) If $u = \frac{xy}{x+y}$ find $\frac{\partial^2 u}{\partial x \partial y}$.

(d) Evaluate

$$\int_0^1 \int_0^1 xy \, dx \, dy.$$

Roll No. ..... Total Page

OBSIT/D-19 123

MATHEMATICAL FOUNDATION OF INFORMATION TECHNOLOGY–III

Paper–BSIT-301

Time Allowed : 3 Hours] [Maximum Marks : 40

Note : Attempt **five** questions in all, selecting at least **one** question from each Unit. Question No. **9** is compulsory.

UNIT–I

1. (a) One number is drawn from numbers 1 to 150. Find the probability that it is divisible be neither 3 or 5. 4

(b) A problem in mathematics is given to five students whose chances of solving the problem are $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}$ and $\frac{1}{5}$. What is the probability that the problem is solved ? 4

2. (a) In a test, an examinee either guesses or copies or knows the answer to a multiple choice question with four choices. The probability that be makes a guess is $\frac{1}{3}$ and the probability that he copies

is $\frac{1}{6}$. The probability that his answer is correct, given that he copied it, is $\frac{1}{8}$. Find the probability that he knew the answer to the question, given that he correctly answered it. 4

(b) If A and B are two mutually exclusive events associated with a random experiment, then prove that P(A or B) = P(A) + P(B). 4

UNIT–II

3. (a) Let $G = \left\{ \begin{bmatrix} a & 0 \\ 0 & 0 \end{bmatrix} / \text{ a is any non-zero real number} \right\}$. Show that G is a group under matrix multiplication. 4

(b) If H_1 and H_2 are two subgroups of G. Then $H_1 \cap H_2$ is also a subgroup of G. 4

4. (a) Prove that the set {0, 1, 2, 3, 4, 5} with addition modulo 6 and multiplication modulo 6 as compositions is a ring. 4

(b) Prove that a division ring has no zero divisors. 4

UNIT–III

5. (a) Expand $x^2y - 5y + 7$ in power of (x – 1) and (y + 2) using Taylor theorem. 4

(b) If $u = \sin^{-1}\left[\frac{x^2 + y^2}{x - y}\right]$, prove that

$$x\frac{\partial u}{\partial x} - y\frac{\partial u}{\partial y} = \tan x.$$ 4

6. (a) Find the extreme value of

$$x^3 + y^3 - 3y - 12x + 20.$$ 4

(b) Find the Jacobian of $u = xyz$; $v = x^2 + y^2 + z^2$; $w = x + y + z$. 4

UNIT–IV

7. (a) Show that

$$\beta(m, n) = \int_0^\infty \frac{x^{n-1}}{(1+x)^{m+n}}\, dx.$$ 4

(b) Evaluate

$$\int_1^e \int_0^{\log y} \int_1^{e^x} \log z \, dz \, dx \, dy.$$ 4

8. (a) Evaluate

$$\int_0^\infty \int_x^\infty \frac{e^{-y}}{y}\, dy \, dx.$$ 4

Roll No. ..... Total Pages : 2

OBSIT/D-19 **12681**

TELECOMMUNICATION-I

Paper–BSIT-303

Time Allowed : 3 Hours] [Maximum Marks : 40

Note : Attempt **five** questions in all, selecting at least **one** question from each Unit. Question No. **1** is compulsory. All questions carry equal marks.

Compulsory Question

1. (a) What are the components of PSTN ? 2

   (b) Discuss the advantages and disadvantages of Time Division Switch. 2

   (c) Write short note on Paging System. 2

   (d) Define the ATM cell. 2

UNIT-I

2. (a) Discuss the advantage of digital signaling over analog signaling in Telephone system. 4

   (b) Discuss the function of End Office in Telephone System. 4

3. (a) What is Multiplexing ? Discuss advantage of TDM over FDM. 4

   (b) Explain RS-232C interface. What is DTE and DCE interface ? 4

UNIT–II

4. (a) Differentiate between Space division and time division multiplexing. 5

   (b) What do you mean by ISDN and its services ? 3

5. (a) Discuss the various types of PSTN components. 3

   (b) Define the Cordless telephone systems and its structure. 5

UNIT–III

6. (a) Discuss the Security issue of Analog Cellular Telephone. 3

   (b) Describe the Architecture of AMPS. 5

7. (a) What is cell in Cellular system ? Describe frequency reuse principle in Cellular system. 4

   (b) What is Handoff ? Explain the different types of Handoff. 4

UNIT–IV

8. What is Frame Relay ? Discuss its Architecture. 8

9. (a) Explain quality of services of Frame Relay. 4

   (b) Discuss different type of switching in ATM. 4

No. ..... Total Pages : 3

BSIT/D-19 **12686**

PROGRAMMING IN C++ I

Paper–**B.S.I.T.-502**

Time Allowed : 3 Hours] [Maximum Marks : 40

Note: Attempt **five** questions in all, by selecting at least **one** question from each Unit. Question no. **one** is compulsory.

Compulsory Question

1. (a) Explain storage class in brief. 2

   (b) List some special properties of constructor function. 2

   (c) What are objects. How objects are created. 2

   (d) Explain operator over loading. 2

UNIT-I

2. (a) Discuss in detail features of object oriented programming. 4

   (b) Explain various bitwise operators with the help of some examples. 4

3. (a) What is the meaning of operator precedence. What are the relative precedence of arithmetic operators. 3

(b) What's the purpose of "Do while" Statement. How it is different from the "While" statement. 3

(c) Write a program to check whether a number is prime or not. 2

UNIT-II

4. (a) What are strings. Explain how strings are different from normal character variable. 3

(b) What is string terminator. Elaborate its purpose. 3

(c) Explain how array is passed to a function. 2

5. (a) What is union. Differentiate between union and structure. 4

(b) Write program in C++ to find the addition of two matrices of order $(m \times n)$. 4

UNIT-III

6. (a) Discuss various advantages of passing arguments by reference. 4

(b) Explain with the help of an example how does an inline function differs from a preprocessor macro. 4

7. (a) What is the meaning of pointer to a function. Explain with the help of an example. 4

(b) What is function template. Write syntax of function template which takes single type of parameter. 4

UNIT-IV

8. (a) Explain how member functions are defined in—

(i) outside the class definition.

(ii) Inside the class definition. 4

(b) What do you mean by destructor. Give their importance. 4

9. (a) Distinguish constructor from normal function. 2

(b) Explain the syntax of destructor. Can it be overloaded. Explain in detail. 4

(c) Explain the need of copy constructor. 2

Roll No. ..... Total Pages : 2

BSIT/D-19 **12688**

Internet Concepts & Application - I

Paper - BSIT - 504

Time allowed : 3 Hours *Maximum Marks : 40*

Note : Attempt five questions in all, selecting at least one question from each unit. Question No. 1 is compulsory. All questions carry equal marks.

1. (i) What is Filtering Mails? 2
   (ii) Short note on Network news? 2
   (iii) Explain Search Engine? 2
   (iv) Difference between Satellite / Wireless Internet connection? 2

UNIT-I

2. Explain various e-mail protocols? 8
3. What is e-mail? Explain operations performed on e-mail. 8

UNIT-II

4. What is FTP? How FTP works. 8
5. (i) Explain Remote Login? 4
   (ii) Difference between TCP/IP 4

UNIT-III

6. Write short notes on: 8

   (i) Hypertext

   (ii) Website

   (iii) Web server

   (iv) Hypermedia

7. What is Search Engines? Difference between Search Engine and Web Directory? 8

UNIT-IV

8. Explain ISDN & Hardware and Software requirements for Internet Connection? 8

9. Write short notes on: 8

   (i) DSL

   (ii) Satellite Internet Connection

Roll No. .....

Total Pages : 3

BSIT/D-19

12689

MICRO PROCESSOR ARCHITECTURE AND PROGRAMMING-III

Paper–**BSIT-505**

Time Allowed : 3 Hours] [Maximum Marks : 40

Note: Attempt any **five** questions in all, select **one** Question from each Unit. Question No. **one** is compulsory.

Compulsory Question

1. (a) What do you mean by Macro and Procedure?

   (b) Differentiate between Static RAM and Dynamic RAM.

   (c) What is the function of EOC signal in ADC interfacing?

   (d) What are the disadvantages of RISC processor? 4×2

UNIT-I

2. (a) Define an interrupt and give the different types of interrupt in 8086. 5

   (b) Discuss the actions performed by 8086 when an interrupt is encountered by it? 3

3. (a) Write an assembly level program to generate 200 ms delay if microprocessor operate on 5MHz frequency. 3

(b) Discuss type 0, type 1, type 2 and type 3 interrupt in 8086. 5

UNIT-II

4. (a) What is the role of A_0 and BHE pins of 8086 in memory interfacing? 3

(b) What are methods used to interface input and output devices with microprocessor? 5

5. (a) Discuss the procedure to interface SRAM with 8086. 4

(b) Interface 2 chips of size 4k × 8 RAM and 2 chips of size 4k × 8 EPROM with 8086 microprocessor. 4

UNIT-III

6. (a) Explain the interface of 8 bit ADC 0808 with 8086 using 8255 with suitable diagram. 6

(b) Explain the term Multiport memory with its key features. 2

7. (a) Describe Control Unit (CU) and Numeric Extension Unit (NEU) in 8087. 5

(b) Why is 8087 called coprocessor? 1

(c) What is bus window in interconnection topologies? 2

UNIT-IV

8. (a) Explain the different features of 80286 microprocessor. 5

(b) What are the differences between features of 80286 and 80386? 3

9. (a) What are the characteristic of RISC and CISC processor? 4

(b) Discuss salient features of Pentium 4. 4