F·Y·B·Sc·(IT·) Sem-I — Prof. Commu. Skills.
Jan - 2017.

F·Y·B·Sc (IT) Sem -I

Con. 97–16.

OV–4045

Jan-2017

(3 Hours)

[Total Marks : 100

Professional Communication Skills

N.B. :(1) **All** questions are **Compulsory**.

(2) **Figures** to the **right** indicate **full** marks.

1. (a) Say whether the following statements are **true** or **false** : 5

   (i) Noise can cause hindrance or problems in transmission or reception of a message.

   (ii) Choice of words makes your communication effective.

   (iii) One important purpose of visual aids is to make the description more clear and vivid.

   (iv) PTO is the abbreviation used for Please turnover.

   (v) Tables, graphs, figures are types of visual aids.

   (b) Fill in the **blanks** : 5

   (i) The Roman numeral for 10 is _____ .

   (ii) Encoding and _____ are important parts of the process of Communication.

   (iii) One psychological barrier to communication is _____ .

   (iv) Date and signature are _____ parts of a letter.

   (v) _____ is natural but listening requires skill.

2. (a) What is the importance of non-verbal communication in our life ? Explain in detail 15
   any three aspects of body language.

                    OR

   (b) Write notes on any **three** of the following :—

   (i) Clarity in Communication

   (ii) Importance of pronunciation in oral communication

   (iii) The process of communication

   (iv) Correctness in communication

   (v) Signs and signals as methods of communication.

[TURN OVER

3. (a) Define 'a barrier' to communication. Explain in detail any two groups of Barriers— **15** also give suggestions to overcome these barriers.

OR

(b) Write notes on any **three** of the following :—

(i) Effect of emotions on communication

(ii) Telephone as a method of communication

(iii) Importance of listening

(iv) Positive attitude

(v) Importance of 'voice' in oral communication.

4. (a) "Wanted an experienced computer programmer for a reputed Multinational company **15** in Mumbai. The candidate should be graduate with atleast two years of experience in programming. Apply with your detailed bio data to : The Advertiser, Post Box No. P-28, The Times of India, Mumbai 400 001".

OR

(b) Write notes on any **three** of the following :—

(i) Uses of brochures

(ii) Elements of a resume

(iii) Preparations to be made by a candidate before appearing for an interview

(iv) Reasons why e-mails are so popular

(v) Explain the terms : NOTICE, AGENDA AND MINUTES.

5. (a) The last two quarters have shown decline in the sales of jams and sauces produced **15** by your company. The management appoints a Committee to investigate into the causes of decline of sales. Imagine You are the chairman of this committee - draft this report also giving suggestions what can be done to improve sales.

OR

(b) Write notes on any **three** of the following :—

    (i)   Features of instructions manual

    (ii)   Methods of data collection

    (iii)   Importance of definitions

    (iv)   Guidelines for preparing visual aids

    (v)   An Abstract.

6. (a) Write a letter of sales to promote any ONE of the following :—   **15**

    (i)   New Sun screen lotion

    (ii)   New cellular phone

    (iii)   Ayurvedic shampoo.

OR

(b) Write notes on any **three** of the following :—

    (i)   Importance of reading

    (ii)   Barriers to listening

    (iii)   Advantages of note making

    (iv)   Disadvantages of oral communication

    (v)   Good speaking skills.

7. (a) Write notes on any **three** of the following :—   **15**

    (i)   Sentence linkers

    (ii)   Word formation in English

    (iii)   Rules of hyphenation

    (iv)   Abbreviations

    (v)   Importance of proof reading.

OR

(b) (i) Proof read the following paragraph to make it into a meaningful and readable   **8**
piece of literature-

To warn means to caution, to warm means to put on guard, to warn means to tell about a possible danger to the receiver. It is about the unpleasant the consequences that may follow ones action. In day-t-d-day life, we come

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across so many such warnings that caution us against bitter and dangerous consequences If we act without paying attention to the instructions given— 'Mind your Head' warning on the staircase cautions us of the consequences if we walk with our heads erect. Similary, we must pay attention to warnings like : Beware of dogs.

(ii)   Do as directed —

    (a)   Give singular forms of –   2

       apples, knives

    (b)   Give the Arabic Numerals of —   3

       V ; L; XX

    (c)   Give the full forms of —   2

       km; temp

Con. 98-16.   (Applied Mathematics -I)   OV-4228

(3 Hours)   [Total Marks : 100

N.B. : (1) **All** questions are **compulsory**.

(2) Attempt any **three** sub-questions from **each** Question Nos. 2 to 7.

(3) **Figures** to the **right** indicate **full** marks.

1. Attempt any **one** :—   **10**

(a) If the matrix $A = \begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$ is similar to a diagonal matrix.

Find the diagonal matrix.

(b) If $u = \operatorname{cosec}^{-1} \sqrt{\dfrac{x^{\frac{1}{2}} + y^{\frac{1}{2}}}{x^{\frac{1}{3}} + y^{\frac{1}{3}}}}$,

show that $x^2 \dfrac{\partial^2 u}{\partial x^2} + 2xy \dfrac{\partial^2 u}{\partial x \partial y} + y^2 \dfrac{\partial^2 u}{\partial y^2} = \dfrac{\tan u}{12} \left(\dfrac{13}{12} + \dfrac{\tan^2 u}{12} \right)$.

2. Attempt any **three** :—   **15**

(a) Under what condition the rank of the matrix $A = \begin{bmatrix} 2 & 4 & 2 \\ 2 & 1 & 2 \\ 1 & 0 & x \end{bmatrix}$ is 3 ?

(b) If $A = \begin{bmatrix} 3 & -3 & 4 \\ 2 & -3 & 4 \\ 0 & -1 & 1 \end{bmatrix}$ prove that $A^3 = A^{-1}$.

(c) Find the solution of system. $\begin{array}{l} x_1 - x_2 + x_3 = 0 \\ x_1 + 2x_2 - x_3 = 0. \\ 2x_1 + x_2 + x_3 = 0 \end{array}$

(d) Reduce the following matrix to the normal form and hence find

its rank $\begin{bmatrix} 0 & 1 & -3 & -1 \\ 1 & 0 & 1 & 1 \\ 3 & 1 & 0 & 2 \\ 1 & 1 & -2 & 0 \end{bmatrix}$

[TURN OVER

3. Attempt any **three** :—   15

  (a) Show that the following vectors are linearly dependent and find the relation between them.

$$X_1 = (1, -1, 1), X_2 = (2, 1, 1), X_3 = (3, 0, 2).$$

  (b) Verify Cayley-Hamilton Theorem for the matrix $A = \begin{bmatrix} 2 & 4 & 3 \\ 0 & -1 & 1 \\ 2 & 2 & -1 \end{bmatrix}$.

  (c) Express the matirx $A = \begin{bmatrix} 2+i & 1 & 3-3i \\ i & 1-i & 2+i \\ 1+i & -3 & 5 \end{bmatrix}$ as the sum of Hermitian

matrix and skew Hermitian matrix.

  (d) Find the minimal polynomial and show that it is Derogatory matrix.

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

4. Attempt any **three** :—   15

  (a) If $r = xi + yi + zk$ prove that grad $\left(\dfrac{1}{R}\right) = -\dfrac{1}{R^r}$ Where $R = |r|$.

  (b) Find the directional derivative of $f(x, y, z) = 3e^{2x-y+z}$ at the point $A = (1, 1, -1)$ in the direction $\overline{AB}$ when $B = (-3, 5, 6)$.

  (c) If $F = x^2 zi - 2y^3z^2 j + xy^2 zk$. Find divF and curlF at the point $(1, -1, 1)$.

  (d) If $a = a_1 i + a_2 j + a_3 k$ and $r = xi + yj + zk$, find curl $(r \times a)$.

5. Attempt any **three** :—   15

  (a) Solve : $\dfrac{dy}{dx} = \sin(x + y) + \cos(x + y)$.

  (b) Solve : $\dfrac{dy}{dx} = \dfrac{y - x + 1}{y + x - 5}$.

  (c) Solve : $(y^4 + 2y) dx + (xy^3 + 2y^4 - 4x) dy = c$.

  (d) Solve : $(y \log x - 1) y dx = x dy$.

6. Attempt any **three** :— 15

    (a) Solve : $\dfrac{d^3y}{dx^3} + 4\dfrac{d^2y}{dx^2} + \dfrac{dy}{dx} = 6y = 0.$

    (b) Solve : $\dfrac{d^2y}{dx^2} - 7\dfrac{dy}{dx} + 12y = e^{2x}.$

    (c) Solve : $\dfrac{d^3y}{dx^3} - 2\dfrac{dy}{dx} + 4y = 3x^2 - 5x + 2.$

    (d) The differential equation of motion of a body is $\dfrac{d^2x}{dt^2} + n^2x = f\cos pt.$

        Solve this equation. What is the solution if $p = n$?

7. Attempt any **three** :— 15
    (a) Find the nth derivative of $x^3 \cdot \sin x$ by using Leibnitz theorem.
    (b) Verify Langrage's Mean value theorem for $f(x) = (x-1)(x-2)(x-3)$ in $(0, 4)$.
    (c) Verify Cauchy's Mean value theorem of the functions

        $f(x) = \log x, \ g(x) = \dfrac{1}{x} \ \text{on}[1, e].$

    (d) Find Maxima and Minima for $f(x, y) = x^3 + 3xy^2 - 15y^2 - 15x^2 + 72x.$

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Con. 99-16.

Fundamentals of Dignal Computing

OV-4492

(3 Hours) [Total Marks : 100]

Note: All questions are compulsory.

Q.1		Attempt all questions.	10
	a.	What is operating System Explain its type.	
	b.	What is ROM? Explain various types of ROM.	

Q.2		Attempt any three.	15
	a	What is number system? Explain various types of number system.	
	b	Perform following conversion operation: $(1111.10111)_2 = (?)_{10}$ and $(121)_8 = (?)_{10}$	
	c	Solve following: $(1010.1100)_2 * (111)_2$ and $(1110111)_2 / (1001)_2$	
	d	Convert the following: $(176)_{10} = (?)_{16}$ and $(762)_8 = (?)_{16}$	

Q.3		Attempt any three.	15
	a	Solve the given minterm using K – MAP and also draw Circuit.	
		$f(A,B,C) = \Sigma m (0,1,2,3,5,7)$	
	b	Explain Basic Gates using truth table and also draw circuit for them.	
	c	Prove Demorgans Theorem using truth table.	
	d	Prove the following Boolean function using truth table $(A+B) (\overline{A+B}) = A$	

Q.4		Attempt any three.	15
	a	What is Multiplexer? Explain working of 4:1 multiplexer.	
	b	What do you mean by Adder? Explain Half Adder Circuit.	
	c	What is subtractor? Explain full subtractor circuit.	
	d	What is Demultiplexer? Explain.	

Q.5		Attempt any three.	15
	a	Explain S-R Flip Flop.	
	b	What is Register? Name their Types.	
	c	Explain concept of one bit memory cell.	
	d	Explain D- Type Flip Flop	

Q.6		Attempt any three.	15
	a	Explain Basic organization of computer.	
	b	Write short note on Hard Disk.	
	c	Explain concept of cache memory with the help of diagram.	
	d	What is Input device? Explain any four input device.	

Q.7		Attempt any three.	15
	a.	State the advantages of Linux OS.	
	b	Explain the term Single user, Single tasking and Multiuser and Multitasking.	
	c	Write notes on Real Time Operating System.	
	d	Explain Distributed operating system.	

F-Y.B.Sc.(I.T.)Sem-I - Elect. Commu. Technology
Jan - 2017

Con. 100-16 Electronic and Communication OV-4651

(3 Hours)   **[Total Marks : 100**

Q.1 ANSWER THE FOLLOWING.   (10)
  1. Explain the formation of P-type semiconductor with necessary diagram.
  2. Draw a neat labeled block diagram of an oscillator.
  3. Explain working of transistor as a switch.
  4. Define AM and draw the waveforms.
  5. State the Sampling Theorem and explain it.

Q. 2 ATTEMPT ANY THREE OF THE FOLLOWING.   (15)
  1. Explain the working of P-N junction diode with necessary diagrams.
  2. With the help of circuit diagram explain the working of half wave rectifier with necessary wave-forms.
  3. Explain the output caracteristics of P-N-P transistor in CE configuration.
  4. The turns ratio of a transformer uses in a bridge rectifier is 100:1. the primary is connected to a 230 V_{RMS} mains supply. Assuming diode voltage drop to be 0.5 V, find the dc voltage across the load resistance & the PIV of each diode. Also find the load current if a load resistance of 100 Ω is used.
  5. When the emitter current of a transistor is changed by 1.1 mA its collector current changes by 0.97 mA. Calculate its common base current gain(β) and common emitter current gain(α).

Q. 3 ATTEMPT ANY THREE OF THE FOLLOWING.   (15)
  1. Explain the working of single stage CE amplifier. Also discuss its frequency response curve.
  2. With the help of circuit diagram explain the working of multistage amplifier. Derive an expression for its gain decibel.
  3. Explain working of RC coupled amplifier with circuit diagram discuss its frequency response curve.
  4. Explain the need of biasing a transistor. Explain the fixed biased method of biasing.
  5. Explain how to plot the load line of CE amplifier. What is Q-point.

Q. 4 ATTEMPT ANY THREE OF THE FOLLOWING.   (15)
  1. Explain the need of tank circuit in an oscillator Explain the RC tank circuit..
  2. Explain the working of RC phase shift Oscillator with its circuit diagram.
  3. Explain the block diagram of IC555.
  4. An astable multivibrator using IC555 has R_A=470kΩ, R_B=2kΩ and C=0.0076µF.Calculate charging and discharging time constant duty cycle and output frequency.
  5. A Colpitt's Oscillator uses following components in its tuned C_1=1500pF , C_2=800pF,L=200µH. Calculate the frequency of the oscillator.

Q. 5 ATTEMPT ANY THREE OF THE FOLLOWING.   (15)
  1. With the help of circuit diagram explain the working of Balanced Modulator.
  2. Explain the block diagram of the basic communication system.
  3. Explain filter method for side band suppression with block diagram.
  4. An audio signal is given by E_m = 100 sin (3140)t. It amplitude modulates a carrier given by E_c = 125 sin 4×10^6 t. Find modulation index, percentage modulation, frequency of carrier, frequency of modulating signal, amplitude of side band components & their frequency.
  5. Explain the low level modulator.

Q. 6 ATTEMPT ANY THREE OF THE FOLLOWING.   (15)
  1. With help of block diagram explain the television transmitter.
  2. Explain TRF receiver with the block diagram.
  3. Compare FM and AM systems.
  4. Explain typical pre-emphasis & de-emphasis circuit with their characteristics.
  5. Explain PPM generator with waveforms.

Q. 7 ATTEMPT ANY THREE OF THE FOLLOWING.   (15)
  1. Explain amplitude shift keying.
  2. Explain types of optical fiber.
  3. Explain the optical links in detail.
  4. Explain the construction and working of LED.
  5. Write a note on Ray model.

Q.1)   **Answer the following**   **(10)**
(1)   How to declare a variable ,Write down rules to name the variable, Explain with example.
(2)   Explain and draw different symbols of flowchart. Write advantages and disadvantages of flowchart

Q.2)   **Answer the following (any 3)**   **(15)**
(1)   Define Algorithm . What are the characteristics of algorithm ?
(2)   Write note on Program Design Process
(3)   Draw flowchart to display Factorial of a number from .
(4)   Write algorithm to display reverse of the number.

Q.3)   **Answer the following (any 3)**   **(15)**
(1)   Write a note on assignment operator and increment and decrement operator
(2)   What are data types in c++ ?
(3)   State following statements are valid or not
      1) J23 2) Emp name   3) 12 Class   4) P.F.Number 5) Total_per
(4)   What do you mean by reference variable ? Explain with example.

Q.4)   **Answer the following (any 3)**   **(15)**
(1)   Explain 'Switch ' statement , with syntax and example
(2)   Explain 'for' loop with syntax and example .
(3)   Write a program in c++ to display multiplication table of 7 as
      per following pattern
            7 * 1 = 7
            7 * 2 = 14
            .
            .
            7 * 10 = 70
(4)   Write a program in c++ to check number is prime or not .

Q.5)   **Answer the following (any 3)**   **(15)**
(1)   What is function ? How to define, call and declare function ?
(2)   Explain getchar() , getch() , getc() , gets() , putc() functions.
(3)   Write a note on function overloading
(4)   Write a program in c++ to display series of odd numbers from 1 to 100 using function

Q.6)   **Answer the following (any 3)**   **(15)**
(1)   Write a note on pointers
(2)   What is array ?what are different types of array ?
(3)   How to pass array elements to a function ?
(4)   Write a program in c++ to display sum and average of n elements using array.

Q.7)   **Answer the following (any 3)**   **(15)**
(1)   Explain a note on string , explain any four string handling functions with
      the help of examples .
(2)   Explain the concept of nesting of structure .
(3)   Write a note on structure .
(4)   Write a program in c++ to display the string in reverse order.