

Sub-

Professional Communication Skills

Con. 1-15.

F.Y.B.Sc (I.T.) (Sem - I) NA-1032

Duration: 3 Hours

Professional Communication Skills Total Marks: 100

April
2015

- NB:
1. All questions are compulsory.
 2. All questions carry equal marks.
 3. Figures to the right indicate full marks.

- Q1. A. Fill in the blanks in the following statements: 05
- i. _____ communication is a personal communication transmitted between the individuals consists of personal interpretation, opinion or gossip.
 - ii. _____ is a powerful force or an inner drive that energises an individual to make a focused effort to achieve her/his goal.
 - iii. _____ barriers can be caused by environmental factors like noise, time and distance.
 - iv. After getting the meaning of the message the receiver provides _____ to the message.
 - v. _____ terms are the foundation of technical writing.
- B. State whether the following statements are True or False: 05
- i. Formal communication channels are based on social relationships in which employees talk about work during social gatherings.
 - ii. Decoding relates to the receiver of a message.
 - iii. Statement of purpose is a self-introductory essay in which an applicant introduces himself/herself.
 - iv. Salutation is the mode of addressing or greeting the sender.
 - v. An executive summary is a modified summary located in the beginning of a report or document.
- Q2. A. Write a comprehensive account on written and oral communication.
- OR
- B. Explain the word 'Kinesics or Body Language' and write a note on the four major types of body language. 15

[TURN OVER

- Q3. A. What are the salient features of business letters? In what respect does the business letters differ from the other type of letters?

OR

- B. Imagine that you have just passed your B.Sc examination. Draft a letter along with brief bio data to Mr. R D Kshirsagar, Manager, New Maharashtra Software Pvt. Ltd. showing your willingness for their training positions. 15

- Q3. A. Imagine that you are working as secretary to your company. Draft a notice to the scheduled annual general body meeting of the board of directors and model minutes for the same.

OR

- B. The cases of Malaria have risen abruptly in your area. The unhygienic conditions and the open water storage by some of the residents have added to the woes. Draft a memorandum to be presented to the health officer of your area to take immediate measures to prevent the spread of it and to take punitive measures against the residents responsible for it. 15

- Q4. A. Imagine that you are working as Welfare Officer and you have been asked by the human resource manager to investigate the causes of frequent clashes among the group of employees. This has caused damage to the reputation of company. Submit your report with recommendations to improve the situation.

OR

- B. Explain the word motivation? Discuss the various ways of motivation. 15

- Q5. A. Your friend has met with an accident recently. You could not find a time to meet him personally. Draft a goodwill letter convincing your compulsion and conveying your regards for him to recover soon and assuring him all the support he may need in future.

OR

- B. What are the general and specific objectives of oral communication in business? 15

- Q6. A. Draft a sales letter to promote **Any One** of the following products:

- i. Brand New Sun Glasses
- ii. New Phablet
- iii. Ultra Tech Washing Machine

OR

- B. Draft a skilled persuasive appealing speech on **Any One** of the following events in about 300 words:
- i. Health is Wealth
 - ii. Cleanliness Drive
 - iii. Scope in IT industry

- Q7. A. Read the following paragraph and edit it to make it meaningful. 15

Do you think that plants could help scientists learn about people Although it may seem odd, gregor mendel found that he could learn a lot about people by studying plants. Actually, plants helped Mendel learn about heredity heredity (3) is the way traits pass from parents to children In humans eye colour hair colour skin colour skin colour and height are all traits. They are past on through heredity. Gregor Mendel was born into a farming family in 1823 he was a gifted students his family could not afford to pay for university studies. Instead Mendel became a monk at the time this was a good way for Mendel to keep study learning. He also began to teach science to high school students. Mendel love nature. He love to walk in the garden among the plants. On one of these walks mendel was one unusual plant he decide to study it.

OR

- B. What are the strategies of effective reading? Explain each one in brief. 15
-

Con. 2-15.

April - 2015

NA-1121

TOTAL MARKS:100

F.Y.B.Sc (IT.) (Sem-I) TIME:3 Hrs.

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Note: 1) All questions are compulsory.

Applied Mathematics - I

2) Attempt any three sub-questions from each questions.

3) Figure to right indicate full marks.

Q.1] Attempt any one:

a) Find Eigen values and Eigen vectors for :

[10]

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

(b) If $v = (1 - 2xy + y^2)^{-1/2}$ then show that

[10]

(i) $x \frac{\partial v}{\partial x} - y \frac{\partial v}{\partial y} = y^2 v^3$ and

(ii) $\frac{\partial}{\partial x} \left\{ (1 - x^2) \frac{\partial v}{\partial x} \right\} + \frac{\partial}{\partial y} \left\{ y^2 \frac{\partial v}{\partial y} \right\} = 0$

Q.2] Attempt any three:

(a) Determine rank of the matrix $A = \begin{bmatrix} 2 & 1 & -3 & -6 \\ 3 & -3 & 1 & 2 \\ 1 & 1 & 1 & 2 \end{bmatrix}$

[5]

(b) Find the inverse of A by adjoint method if $A = \begin{bmatrix} 1 & 0 & 2 & 1 \\ 1 & 1 & 0 & 1 \\ -1 & 0 & 1 & 2 \\ 2 & 3 & 1 & 0 \end{bmatrix}$

[5]

(c) Solve the following system of equations

[5]

$$2x_1 - 3x_2 + x_3 = 0$$

$$x_1 + 2x_2 - 3x_3 = 0$$

$$4x_1 - x_2 - 2x_3 = 0$$

(d) Examine for consistency and solve

[5]

$$5x + 3y + 7z = 4$$

$$3x + 26y + 2z = 9$$

$$7x + 2y + 10z = 5$$

Q.3] Attempt any three:

(a) Examine for linear dependence of given vectors

[5]

$$x_1 = (1 \ 2 \ 4)^T, \quad x_2 = (3 \ 7 \ 10)^T$$

(b) Calculate A^{-1} by using Cayley Hamilton theorem. Where $A = \begin{bmatrix} 3 & 6 \\ 1 & 2 \end{bmatrix}$

[5]

[TURN OVER

(c) Show that the matrix A is derogatory also find its minimal polynomial. [5]

$$A = \begin{bmatrix} 1 & -6 & -4 \\ 0 & 4 & 2 \\ 0 & -6 & -3 \end{bmatrix}$$

(d) Show that the matrix $A = \begin{bmatrix} 1 & 2-i & 3-i \\ 2+i & 3 & -i \\ 3+i & i & 3 \end{bmatrix}$ is Hermitian. [5]

Q.4] Attempt any three:

(a) If $\vec{r} = t^3 \hat{i} + \left(2t^3 - \frac{1}{5t^2}\right) \hat{j}$. Then show that $\vec{r} \times \frac{d\vec{r}}{dt} = \hat{k}$ [5]

(b) Find unit vector normal to the surface $x^2 + y^2 + z^2 = 3a^2$ at (a, a, a). [5]

(c) Find curl (curl \vec{F}) If $\vec{F} = x^2 y \hat{i} - 2xz \hat{j} + 2yz \hat{k}$ at (1, 0, 2). [5]

(d) If $\vec{A} = (ax + 3y + 4z) \hat{i} + (x - 2y + 3z) \hat{j} + (3x + 2y - z) \hat{k}$ is Solenoidal find value of a. [5]

Q.5] Attempt any three:

(a) Form the differential equation from

$$x = a \sin(wt + c) \text{ where } a \text{ and } c \text{ are arbitrary constants. [5]}$$

(b) Solve $(e^x \tan y) \cdot dx + (1 - e^x) \sec^2 y \cdot dy = 0$ [5]

(c) Solve $\frac{dy}{dx} = \cos(x+y)$ [5]

(d) Solve $\frac{dy}{dx} = \frac{4x^3 y^2 + y \cos xy}{2x^4 y + x \cos xy}$ [5]

Q.6] Attempt any three:

(a) Solve $(x+1) \frac{dy}{dx} - y = e^x (x+1)^2$ [5]

(b) Solve $(1+y^2) + (x - e^{\tan^{-1} y}) \cdot \frac{dy}{dx}$ [5]

(c) Solve $(x - 2e^y) dy + (y + x \sin x) dx = 0$ [5]

(d) Find the curve which passes through the points [2, 1] and [8, 2] for which sub tangent at any point varies as the abscissa of that point. [5]

Q.7] Attempt any three:

(a) Find n^{th} derivative of $y = \frac{x}{(x-1)(x-2)(x-3)}$ [5]

(b) If $p^2 = a^2 \cos^2 \theta + b^2 \sin^2 \theta$, Prove that $p + \frac{d^2 p}{d\theta^2} = \frac{a^2 b^2}{p^3}$ [5]

(c) If $y = \sin^{-1} \left(\frac{1+2\sin x}{2+\sin x} \right)$ then show that $\frac{dy}{dx} = \frac{\sqrt{3}}{2+\sin x}$ [5]

(d) If $\cos^{-1} \left(\frac{y}{b} \right) = \log \left(\frac{x}{n} \right)^n$ then Show that $x^2 y_{n+2} + (2n+1)xy_{n+1} + 2n^2 y_n = 0$ [5]

- Note: 1) All question are compulsory.
2) Q. 2 to Q.7 have internal choice.
3) Use of scientific non-programmable calculator is allowed.
4) Figures to the right indicate full marks.

Q.1. Attempt the following questions. [10]

- 1) What are binary codes? Why are they used ?
- 2) What are universal gates? Why are they so called?
- 3) What are multiplexers?
- 4) What are Flip-Flop circuits in electronics?
- 5) Write a short note on input devices.

Q.2. Attempt any THREE of the following. [15]

- 1) With the help of suitable examples explain unsigned and signed integers in number system.
- 2) Explain with examples , error correcting codes and how are they used?
- 3) Multiply , $(10010010)_2$ and $(1101)_2$
- 4) Subtract the decimal numbers $(29)_{10}$ and $(38)_{10}$ by converting them into binary.

Q.3. Attempt any THREE of the following. [15]

- 1) What do you mean by logic 'NOT' gate. Explain its working using transistorized circuit. Write down its truth table and draw its symbol.
- 2) State and Prove the laws of Boolean algebra.
- 3) Simplify the POS Boolean expression below providing a result of SOP from out -
 $(A+B+C+D)(A+B+\bar{C}+D)(A+\bar{B}+C+\bar{D})(A+\bar{B}+\bar{C}+D)(\bar{A}+\bar{B}+\bar{C}+D)(\bar{A}+B+C+\bar{D})(\bar{A}+B+\bar{C}+D)$
- 4) Simplify the following using K-map and realize it using 2 input gates.
 $F(A,B,C,D) = \sum m(1,2,9,10,14,15)$

Q.4. Attempt any THREE of the following. [15]

- 1) A step in space vehicle checkout depends on four sensors S_1, S_2, S_3 and S_4 . Every circuit is working properly if sensor S_1 and at least two of the other three sensors are at logic 1. Assuming that output is 1 when circuit is working properly. Implement the system using NAND gates only after finding minimal SOP expression for the output.
- 2) Write a note on 8 to 3 priority encoder
- 3) Implement the function ; $F(A,B,C,D) = \sum (1,3,5,6,12,13,16,18)$ using 8 to 1 line Mux.
- 4) Explain in detail Binary encoder.

Q.5. Attempt any THREE of the following [15]

- 1) Explain the working of master-slave Flip Flop.
- 2) What are shift registers? Explain the working of serial in to parallel out 4-bit shift register.
- 3) Define counter. Design circuit diagram for 3-bit binary counter.
- 4) Explain level - triggered and edged- triggered FFs.

[TURN OVER

Q.6. Attempt any THREE of the following

[15]

- 1) Write a short note on functional units of computer.
- 2) Explain in brief about types of memory in computer.
- 3) Explain the structure and working of (1) Optical disk and (2) Magnetic Tape
- 4) Explain the components of computer organization.

Q.7. Attempt any THREE of the following.

[15]

- 1) State the advantages of Linux OS.
- 2) Explain the use and execution of following Linux commands:
i) pwd ii) cp iii) kill iv) wall
- 3) Compare Windows with Linux
- 4) Define distributed O.S. List the characteristics of distributed O.S.

----- THE END -----

Q.1 ANSWER THE FOLLOWING.

(10)

1. Define reverse biasing of a diode.
2. Draw a neat labeled diagram of RC coupled amplifier.
3. What is negative feedback.
4. Define FM and draw the waveforms.
5. State the Sampling Theorem.

Q.2 ATTEMPT ANY THREE OF THE FOLLOWING.

(15)

1. Explain the formation of N-type semiconductor with necessary diagram.
2. With the help of circuit diagram explain the working of half wave rectifier with necessary wave-forms.
3. Define α and β of a transistor. Obtain the relation between them.
4. The turns ratio of a transformer uses in a bridge rectifier is 50:1. the primary is connected to a 230 V_{RMS} mains supply. Assuming ideal diode, find the dc voltage across the load resistance & the PIV of each diode. Also find the load current if a load resistance of 47 Ω is used.

Q.3 ATTEMPT ANY THREE OF THE FOLLOWING.

(15)

1. Explain the concept of modulation.
2. With the help of circuit diagram explain the working of multistage amplifier. Derive an expression for its gain decibel.
3. Explain the working of single stage CE amplifier.
4. Draw and explain the working of DC amplifier.

Q.4 ATTEMPT ANY THREE OF THE FOLLOWING.

(15)

1. What is positive feedback. State its advantages and disadvantages.
2. Explain the working of RC phase shift Oscillator with its circuit diagram.
3. Explain the block diagram of IC555.
4. Explain the working of IC 555 as a astable multivibrator.

Q.5 ATTEMPT ANY THREE OF THE FOLLOWING.

(15)

1. Explain the need for modulation.
2. Explain the block diagram of the basic communication system.
3. Explain 90° phase shift method for side band suppression with block diagram.
4. An audio signal is given by $E_m = 80 \sin(3240)t$. It amplitude modulates a carrier given by $E_c = 100 \sin 3 \times 10^6 t$. Find modulation index, percentage modulation, frequency of carrier, frequency of modulating signal, amplitude of side band components & their frequency.

Q.6 ATTEMPT ANY THREE OF THE FOLLOWING.

(15)

1. Explain typical pre-emphasis & de-emphasis circuit with their characteristics
2. Write a short note on TDM.
3. Compare FM and AM systems.
4. Explain PAM generator with waveforms.

Q.7 ATTEMPT ANY TWO OF THE FOLLOWING.

(15)

1. Explain frequency shift keying in detail.
2. Explain types of optical fiber.
3. Write a short note on photo detectors.
4. Write a note on Ray model.

- Q.1) (A) Answer the following (10)
- (1) Define Algorithm, Explain with simple example.
 - (2) How to write single line comment and multiline comment in c++.
 - (3) Draw flowchart to check number is positive or negative.
 - (4) Write c++ program to display square and cube of the number .
 - (5) Which are different categories of algorithmic operations.
- Q.2) (A) Answer the following (any 2) (10)
- (1) Write an algorithm to display series of numbers from 1 to 100.
 - (2) Explain and draw different symbols of flowchart. Write advantages and disadvantages of flowchart
 - (3) Write down characteristic of algorithm.
- (B) Answer the following (any 1) (5)
- (1) Draw flowchart to display smallest number from 3 numbers
 - (2) Write down rules for drawing flowchart.
- Q.3) (A) Answer the following (any 2) (10)
- (1) How to declare a variable ? Write down rules for declaring variables.
 - (2) Explain relational operator and logical operator .
 - (3) Write a note on symbolic constants.
- (B) Answer the following (any 1) (5)
- (1) Explain various data types available in c++.
 - (2) What do you mean by reference variable ? Explain with example.
- Q.4) (A) Answer the following (any 2) (10)
- (1) Explain simple 'if' statement , 'if...else' statement , and 'nested if ' statement with syntax and example
 - (2) Explain 'break' statement and 'continue' statement with example
 - (3) Explain 'while' and 'do ... while ' loop with syntax and example .
- (B) Answer the following (any 1) (5)
- (1) Explain 'for' loop with syntax and example .
 - (2) Write a program in c++ to display following output.
1
1 2
1 2 3
1 2 3 4
- Q.5) (A) Answer the following (any 2) (10)
- (1) Write a note on function overloading
 - (2) Explain getchar() , putc() , getc() , gets() , puts () functions.
 - (3) Explain the difference between call by value and call by reference.
- (B) Answer the following (any 1) (5)
- (1) Write a program in c++ to compare two strings by using string functions
 - (2) Write note on functions .Explain declaration , calling and definition of function .
- Q.6) (A) Answer the following (any 2) (10)
- (1) How to initialize one dimensional array ? Explain compile time and runtime initialisation .
 - (2) What is array ?what are different types of array ?
 - (3) Explain passing array elements to a function with example.
- (B) Answer the following (any 1) (5)
- (1) Write a program in c++ to find sum and average of 10 array elements .
 - (2) Explain the concept of pointers.
- Q.7) (A) Answer the following (any 2) (10)
- (1) What is structure ? Explain.
 - (2) Explain any five functions of vector.
 - (3) Explain strcpy() and strcmp() function with example.
- (B) Answer the following (any 1) (5)
- (1) Write a program in c++ to search given character in the given string
 - (2) Write a program in c++ to display the string in reverse order.