F.Y.C.S

Max. Time : 2½ Hrs. Max. Marks : 75

Sem-I 25/11/19

Instructions :-

1) All questions are compulsory.
2) Mixing of sub questions are not allowed.
3) Write in clear, legible, writings.

D. Mathematics

Q.1) Answer Any Three. **(15)**

a) Write a Note on types of Functions.

b) If the function $f : 1\ R \rightarrow 1R$ defined as.
$F(x) = \frac{2x-3}{7}\ \forall\ x\ \varepsilon IR$ Then show that
f is bijective. hence find f^{-1}

c) find first four terms of (an) where
$an = a_{n-1} + 3a_{n-2}$, $a_0=1$, $a_1 = 2$

d) How many different license plots are there that inndue 1, 2 or 3 letters followed by four digits.

e) State product rule in counting of objects

f) Draw all possible graph with 3 vertices.

Q.2) Attempt any three **(15)**

a) Let $F(x) = x^2 + 1$ and $g(x) = \frac{1}{x-1}$ then find (fo g) (x)

b) Draw the diagraph of the relation
R = {(1, 2), (3, 4), (3, 2), (4, 5), (5, 3), (1, 4)}

c) Let P = {1, 2, 3, ..., 10} be a poset who x Hasse diagram is given below find gℓb (2, 3), gℓb (2, 7), ℓub (3,2), ℓub (3, 5)

d) Find degree of recurrence relation
$2ar + 3a_{r-1} - 3a_{r-2} = 5r + 3$

e) Using back tracking method solve the following Recurrence Relation.
$tn = 1,\ n = 0$
$= 2t_{n-1} \qquad n \geq 1$

f) Describe towers of Hanio Puzzle. Formulate a recurrence relation for it.

Q.3) Attempt any three. **(15)**

a) Find coefficient of $x^2 y^3 z^4$ in the expansion of $(ax + by + cz)^9$

b) State and prove Pascal Identity.

c) Write a Note on Godel Numbers.

d) Define a language L over an alphabet A.
Let A {a, b, c} find L* where language.

e) Show that there does not exists a simple graph with 8 vertices and 29 edges.

f) Does there exits a party of 11 Professors such that each one has exactly 7 friends in themselves

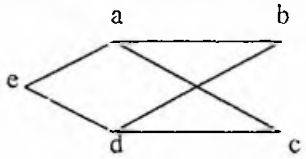
Q.4) Attempt any three **(15)**

a) Write a note on finite state Automata.

b) Write a note on Turning Machines.

c) How many edges are there in a graph with to vertices each of degree 6 ?

d) Find adjacency matrix of graph G give below :



e) Write Algorithms of Depth First search.

f) Write a Note on Binary tree.

Q.5) Attempt any three **(15)**

a) Let A and B sets such that $|A| = 4$ $|B| = 5$. Find the Numbers of function from A to B. Also find the number of function from B to A.

b) If A = {1, 2, 3} and R = { (1, 1) (1, 2), (2, 1), (2, 2), (2, 3), (3, 1), (3, 3)}
find M(R) and $[M(R)]^2$

c) Let A be the set of lines in a place define the relation R on A by a R b if (live) a is an equivalence relation.

d) Write a Note on Lattices.

e) State and prove Pascal's Identity

f) Draw the graph G corresponding to each adjacency matrix.

$$\begin{pmatrix} 1 & 1 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 2 \\ 2 & 0 & 2 & 2 \end{pmatrix}$$

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CS 18/11/19

(2½ Hours) [Total Marks: 75]

TE:1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Illustrations, in-depth answers and diagrams will be appreciated.
4) Mixing of sub-questions is not allowed.

Attempt All Questions. (Each of 5 marks) (15M)

Multiple Choice Questions (5M)

ne decoded instruction is stored in ____.
a) IR b) PC c) Registers d) MDR
____is used to store data in registers.
a)Flip-flop b) JK Flip-flop c) RS Flip-flop d) None of these
ANSI stands for_____.
a) American National Standards Institute
b) American National Standard Interf ce
c) American Network Standard Interfacing
d) Amercian Network Security Interrupt
The instruction, Add #45, R1 does .
a) Adds the value f 45 to the address of R1 and stores 45 in that address.
b) Adds 45 to the value f R1 and stores it in R1.
c) Finds the memory location 45 and adds that content that of R1.
d) None of the e.
The addressing mode which uses the PC instead of a general purpose register is_____.
a) Indexed with offset b) Relative
c) direct d) Both a) and c)

Fill in the blanks

igle bus, 1, sequential, JK flip-flop, 5, RS flip-flop, 10, multiple bus)
ip-flop is a basic element of _____circuits.
he usual BUS structure used to connect the I/O devices is____.
The minimum number of selection inputs required for selecting on out of 32
___
ace condition may exist in_____sequential circuits.
Then 1101 is used to divide 100010010 the remainder is_____

(c) Short Answers (Attemtp all)

i) What are counters?
ii) Design NAND gate using AND, OR, NOT gates.
iii) Define minterms and Maxterms terms.
iv) How instructions of typical microprocessors are classified?
v) What are uses of interrupts?

Q.2 Attempt the following (Any THREE) (Each of 5 Marks) (15M)

a) With the help of neat diagram explain basic functional units of a compouter.
b) How the memory and the processor can be connected? Explain with diagram.
c) Perform with 2's complement arithmetic: -34+22
d) List and explain in brief main features of fourth g n ration computers.
e) List the stemps needed to execute the machine instruction. Load R2, LOC
f) Design half-adder circuit.

Q. 3 Attempt the following (Any THREE) (Each of 5Marks) (15M)

a) Explain Big - Endian and Little - Endian Assignments.
b) What are addressing modes? Why different addressign modes are required?
c)Explain different RISC - type addressing modes.
d) Compare RISC and CISC instruction sets.
e) Explain De-Multiplexer
f) What is an assembler? What is object program?

Q. 4 Attempt the following (Any THREE) (Each of 5Marks) (15M)

a) List and explain with neat diagram main hardware components of processor.
b) Consider the RISC Style Load instruction
Load RS, x(R7)
Examine the actions involved in fetching and executing the above instruction.
c) Explain with neat diagram conceptual view of the hardware needed for computation.
d) Explain 5-stage organization with neat figure. What is Datapath?
e) Explain with example sequence of actions needed to fetch and execute an unconditional
branch instruction.
f) How the processor generates the control signals that cause these actions to take place in the correct sequence and at the right time?

Q. 5 Attempt the following (Any THREE) (Each of 5Marks) (15M)

a) Explain Gated S-R Flip flop
b) Describe Shift Register with its types.
c) What is the difference between Decoder and De-Multiplexer
d) Design Full Adder Circuit
e) What is the need of Multiplexer ? Explain 4:1 Mux.
f) Explain Instruction set Architecture

Max Time: 2½hrs FY-CS Sem-I (Database System) **Max Marks: 75**

19/11/19

Instructions:

1) **All** questions are **compulsory**.
2) Mixing of sub questions are not allowed.
3) Write in clear, legible, writing.

Q I Answer the following **15**

A) Choose the correct option **05**

1) A_____ is a collection of related data items stored at one place.
   a) file b)folder c)doc d)database
2) The changes made to database can be reverted back with the help of ____ command.
   a)commit b)rollback c)done d)backup
3) The _____ level is very close to physical storage of data.
   a)internal b)external c)view d)outsider
4) _____ is a step by step decomposition of complex records into simple records.
   a)Normalization b)Simplification c)Merging d)Solving
5) _____ statement is used to delete some or all records from existing table.
   a)Alter b)Truncate c)Drop d)Delete

B) Fill in the blanks **05**

(full, sigma , subquery , mainquery, relation , attribute, 3NF,2NF)

1. Various properties that describe an entity are known as_____.
2. This normal form used to minimize the transitive redundancy.
3. ___ database backup is maintained at one recovery site as backup copies of that site.
4. Symbol used to denote the selection operation in relational algebra is____.
5. A_____ is a query within a query.

C) Answer in one or two sentences **05**

1. Define the term DBMS.
2. What is derived attribute?
3. What is aggregation?
4. What is primary key?
5. What is the purpose of truncate command?

Q II Attempt any **three** **15**

A) What are the different types of database system users?
B) Describe the overall architecture of DBMS with diagram.
C) Explain hierarchical and network database model.
D) List and explain different types of notation used in ER diagram.
E) Explain the term Primary key and Foreign key with example.
F) Construct an ER diagram for a hospital with a set of patients and a set of medical doctors, Associated with each patient, a log of the various tests and examinations conducted.

Q III Attempt any **three** **15**

A) What is normalization? Explain 1NF and 2NF in detail.
B) Differentiate between full functional dependency and partial functional dependency.
C) Write a short note on Selection operation and Projection operation.
D) Explain backup and recovery process in MySQL.

E) What is mean by aggregate function?
F) Explain the terms: DROP,TRUNCATE,ALTER with the help of example.

Q IV Attempt any **three** **15**

A) Explain various String functions available in MySQL.
B) Explain various Math functions available in MySQL.
C) What are joins? What are different types of JOINS explain with the help of example.
D) What is view? How it is created and stored?
E) Explain the concept of sub query in detail.
F) Define the term privilege with respect to database and its types.

Q V Attempt any **three** **15**

A) Write a short note on DBA.
B) What is strong entity and weak entity? Explain with the help of example.
C) Explain various data definition statements in SQL.
D) Write a MySQL query to create and drop user with and without privileges.
E) Explain security and authorization in SQL.

FY- CS. Semester I (2½ Hours) Python 20/11/19 [Total Marks: 75]

N.B. 1) All questions are compulsory.
2) Figures to the right indicate marks.
3) Illustrations, in-depth answers and diagrams will be appreciated.
4) Mixing of sub-questions is not allowed.

Q. 1 Attempt All (Each of 5Marks) **(15M)**

(a) Multiple Choice Questions **(5M)**

1 What type of data is: a=[(1,1),(2,4),(3,9)]?
(a) Array of tuples (b) List of tuples
(c) Tuples of lists (d) Invalid type

2 What is "Hello".replace("l", "e")
(a) Heeeo (b) Heelo
(c) Heleo (d) None

3 What will be the value of X in the following Python expression?
X = 2+9*((3*12)-8)/10
(a) 28.4 (b) 30.0
(c) 27.2 (d) 30.8

4 What will be the output of the following Python code?
```
x = ['ab', 'cd']
for i in x:
   x.append(i.upper())
print(x)
```
(a) ['AB', 'CD'] (b) ['ab', 'cd']
(c) ['ab', 'cd', 'AB', 'CD'] (d) None of the mentioned

5 What will be the value of the following Python expression?
4+2**5//10
(a) 3 (b) 7
(c) 0 (d) 77

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

1 _____ cannot be used as a variable name.
2 Arithmetic operator (%) is used for_____.
3 An instance of a class is called as_____.
4 _____ Keyword is used to define an anonymous function.
5 _____statement is used when a statement is required syntactically but you do not want any command or code to execute.

(c) Short Answers (5M)

1 Write syntax to create a List.
2 What is the use of del statement?
3 What function do you use to write a string?
4 Explain the use of sqrt() function.
5 Explain ** operator.

Q. 2 Attempt the following. (Any THREE) (Each of 5Marks) (15M)

(a) Which are the two basic modes in Python Interpreter? Explain.

(b) Define Built-in functions. Explain any 4 built-in functions along with an example.

(c) What is the use of Math module? Write any 4 functions of it.

(d) Discuss "list" data type in regards with the following points:
i) Declaration and initialization of variable of "list" data type
ii) Displaying second element of a list.
iii) Delete third element of a list.
iv) Display all elements starting from second position in a list.
v) Repeat list twice and display it.

(e) Write a program in python to check Armstrong Number. Take input from user.

(f) Write a program to create an anonymous function to calculate Cube of a number.

Q. 3 Attempt the following. (Any THREE) (Each of 5Marks) (15M)

(a) What is the use of nested if condition? Explain with example.

(b) Give Python statement for the following:
i) Create a string mystring with value " **Rizvi Education Society**"
ii) Print last character of string.
iii) Print length of the above string.
iv) Print 3rd to 5th character of above string.
v) Print 3rd to 2th last character of above string.

(c) Explain the use of range () in python along with an example.

(d) When do we use continue statement? Explain with example.

(e) Write a program in Python to find a number is divisible by 9, 10 and 11.

(f) Write a program in Python to find the area of Parallelogram.

Q. 4 Attempt the following. (Any THREE) (Each of 5Marks) (15M)

(a) Discuss anonymous function with example.

(b) Write a short note on List Comprehension.

(c) Define a class and a object in python? How to create it? Explain with example.

(d) Explain the working of Dictionary with example.

(e) Write a program in Python to find the input number is perfect number or not.

(f) Write a program in Python to print the sum of series **1-2+3-4+5-6+7-8.**

Q. 5 **Attempt the following. (Any THREE) (Each of 5Marks)** **(15M)**

(a) What is data type? What are the rules and conventions for declaring a variable?

(b) Explain operator precedence with example.

(c) What do we mean by function recursion? Explain with example.

(d) Write a python program to print reverse of a number. Take Input from User

(e) Write a program in Python to print the following output

Class:- F.Y.B.Sc.C.S. Sem-I

Subject:- FOSS 21/11/19

(Time:- 2 hours 30 minutes) **Total Marks: - 75**

N.B.

1) All questions are compulsory.
2) Make suitable assumptions wherever necessary and state the assumptions made.
3) Answers to the same question must be written together.
4) Draw neat labeled diagrams wherever necessary.

Q.1) Attempt All (Each 5 Marks) **(15 M)**

(A) Multiple Choice Questions

i) MySQL is Licensed under _____.

a. GPL. b. LGPL.

c. GNU GPL. d. Apache 2.0.

ii) Trademark, patent and copyright is part of _____.

a. Personal Rights. b. Intellectual Property Right.
b. Intellectual Personal Right d. Intellect property Right.

iii) POSTGREE SQL is an example of _____.

a. Freeware. b. Licensed Software.
b. Shared Software. d. Closed Source Software.

iv) Which of the following is closed source software?
a. Python b. MySQL
c. Joomla d. Unix

v) FSF is started by _____.

a. Solomon Hayke. b. Dennis Ritchie.

c. Richard Stallman. d. Jimmey Wales.

(B) Fill in the blanks:

(Apache, Maharashtra,Open source,Docker,chrome, internationalization,Free Hardware Design, Open Source Software,Mozilla firefox)

i)_____ is the process of adapting software for specific region or region by adding locale specific component and translating text.

ii) _____ is used to run different application software on machine using single kernel.

iii) _____ refer to design which can be freely copied, distributed, modified and manufactured.

iv) _____ provides information of product in local language.

v) Linux uses_____ server to run scripting.

(C) Short Answers. (Attempt All)

i) Copyright.

ii) Free Software Foundation.

iii) LGPL.

iv) Mobile OS.

v) Public domain.

Q.2)Attempt the following (Any three) (each of 5 marks) **(15 M)**

i) Write Principle of Open Source Software.

ii) Write note on open source Government.write benefits of open source government.

iii) Write benefits of internationalization.

iv) Explain open source development model with diagram.

v) Write History of open source.

vi) Discuss the problem in traditional commercial software.

Q.3)Attempt the following (Any three) (each of 5 marks) **(15 M)**

i) Explain the following terms

a) Software Freedom. b) Philosophy of Open Source Software .

ii) Write short note on the following:

a) github. b) Linux.

iii) Define debugging? Explain GDB.

iv) Write note on Apache web server.

v) Explain Open Source Development Model.

vi) Write about any two foss license.

Q.4)Attempt the following (Any three) (each of 5 marks) **(15 M)**

i) Write note on free web browser..

ii) Write note on Lamp.

ii) what is containarization? Explain Docker?

iii) Discuss virtualization. Explain its types.

iv)Write note on GCC.

v)Write note on wordpress.

vi) Write note on Apache Open Office.

Q.5)Attempt the following (Any three) (each of 5 marks) **(15 M)**

i) Explain public domain software.

ii) Explain the following terms:

a) Open Source Hardware
b) Open Source Media.

iii) Write note on Open Source Teaching .

iv) Write about virtualization Technologies.

v) Explain the role of open source in todays world.

vi) What are the open source funding model.

F4 BSC-CS 22/11/19

F.Y.B.Sc. (C.S.), SEM I Sem-I

Descriptive Statistics and Introduction to Probability

Time $2\frac{1}{2}$ hrs Marks: 75

Q.1) Answer the following Questions Marks: 15

A) Choose the correct option Marks: 5

1) Skewness means deviation from_____

a) Centre b) Symmetry c) midpoint d) none of these

2) First raw moment is _____

a) Arithmetic mean b) mode c) median d) zero

3) P (A') = _____

a) P (A) – 1 b) P (A) c) P (A) + 1 d) 1- P (A)

4) If $0.3 \leq r \leq 0.7$, where r is Karl Pearson's product moment correlation co-efficient between X and Y, then X and Y have

a) Strong positive correlation b) Moderate positive correlation

c) Weak positive correlation d) no correlation

5) Mean – Mode = _____ (Mean – Median)

a) 4 b) 2 c) 3 d) -3

B) State true or False. Marks: 5

1) Kurtosis is the measure of lack of symmetry.

2) Kari Pearson's correlation co-efficient lies between -1, 1

3) If A and B are independent events then A' and B' are also independent events

4) Range is a measure of central tendency.

5) To locate the mode graphically we have to construct the histogram

C) Answer in one or two lines. Marks: 5

1) Define combined Mean.

2) Give the example of spurious correlation.

3) Given that P (A) = 0.8, P(B) = 0.7, P(A ∪ B)?

4) State the formula for Quartile deviation.

5) Define raw moments.

Q.2) Attempt any three of the following, Marks: 15

A) Draw a frequency polygon for the following data.

Weight in kg	40 – 45	45 – 50	50 – 55	55 – 60	60 - 65
Number of men	8	14	21	18	10

B) Following data gives the distribution, the A.M. of marks is 244. Find missing frequency.

Classes	0-100	100 – 200	200- 300	300- 400	400-500	500-600
Frequency	8	25	45		7	3

C) Calculate standard deviation for the following data.

Monthly wages in '000 Rs.	10-15	15-20	20-25	25-30	30-35	35-40
No. of workers	16	20	45	35	22	12

D) Calculate the first four central moments

Classes	100- 110	110-120	120-130	130-140	140-150
Frequency	7	13	25	25	30

E) For the following data obtain co-efficient of regression line of X of Y.

X	45	44	50	53	66	30	48
Y	42	42	41	42	56	30	43

F) A class consists of six girls and ten boys. If a committee of three is chosen at random, find the probability that,

i) Three boys being selected.

ii) Exactly two boys and a girls being selected

iii) At least one boy being selected.

Q.3) Attempt any three of the following Marks: 15

A) Define: i) Discrete variable, ii) Continuous variable

B) Calculate Median of the following data

Electricity Bill in Rs.	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40
No of students	2	8	12	23	25	20	9	1

[PTO]

C) Find Q.D and co-efficient of Q.D. for the following data

Marks	0-10	10-20	20-30	30-40	40-50
No. of Students	22	38	46	35	19

D) Calculate correlation coefficient between Mother's height and daughter's height from the data given below

Mother's height (x) inches	65	66	67	67	68	69	71	73
Daughter's height (y) inches	67	68	64	68	72	70	69	70

E) What is meant by 'skewness' draw figures to indicate different types of skewness and locate roughly the positions of mean, median and mode in each case.

F) The letters of the word 'SEMINAR' are arranged randomly. What is the probability that an arrangement
i) Ends with S, (ii) Has all vowel occupying even places?

Q.4) Attempt any three of the following Marks: 15

A) Draw a Histogram for the following data

Expenses per day in Rs.	10-30	30-50	50-70	70-90	90-100
Number of Students	5	13	24	15	12

B) Calculate Mode for the following data

Electricity bill (in '00Rs)	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40
No of students	2	8	12	23	25	20	9	1

C) Write the merits and demerits of the standerd deviation.

D) Given that $\sum fx = 100$, $\sum fx^2 = 4000$, $\sum fx^3 = 24,500$, $\sum fx^4 = 13,86,000$ and $\sum f = 100$ find β_1 and β_2

E) Obtain Spearman's rank correlation for the following data.

Rank by judge 1	6	2	4	1	3	5	10	9	8	7
Rank by judge 2	5	1	3	4	2	6	8	10	7	9

F) Three persons X, Y,Z are being considered for the appointment as the manager for a company whose chance of being selected for the post are 4/9 , 1/3, 2/9 respectively. The probabilities that bonus scheme will be introduced if X, Y, Z become manager are 3/10, 4/5, 1/2 respectively

i) What is the probability that bonus scheme will be introduced in the company.

ii) If bonus scheme is introduced in the company, What is the probability that the Manager appointed is x?

Q.5) Attempt any three of the following. Marks: 15

A) The following data gives the number of children in 50 families Construct a discrete frequency table using tally marks for the data

4, 2, 0, 2, 3, 2, 2, 1, 0, 2, 3, 5, 1,1, 4, 2,1,3, 4, 2, 6, 1, 2, 2, 2,
1, 3, 4, 1, 0, 1, 3, 4, 1, 0, 1, 2, 2, 2, 5, 2, 4, 3, 0, 1, 3, 6, 1, 0, 1

B) Calculate D_7 and P_{65} for the following data.

Marks	0-10	10-20	20-30	30-40	40-50	50-60
No of Students	4	12	20	8	4	2

C) Obtain the combined mean for the following data

	Group I	Group II
No. of observations	80	120
Mean	25	30
Standard deviation	6	4

D) With usual notations $\mu_1' = 2$, $\mu_2' = 8$, $\mu_3' = 14$, $\mu_4' = 50$ Compute β_1 and β_2

E) Explain the terms: i) Positive correlation, ii) Negative correlation

F) For three events A, B, C we know that A and C are independent, B and C are independent, A and C are independent. Given $P(A \cup C) = 2/3$, $P(B \cup C) = 3/4$, $P(A \cup B \cup C) = 11/12$, Find P(A), P(B), P(C)

F.Y.C.S 23/11/19

Sem-I SSD

Marks: 75 **Time: 2 ½ hours**

N.B. 1. Attempt all questions

2. Draw suitable diagrams wherever necessary.

3. Mixing of sub questions is not allowed.

Q1. Attempt all. (Each of 5 marks) **(15)**

A. Choose the correct alternative **(5)**

1. _____ development is an important part of the individual which never stops growing.
   a) Height
   b) Personality
   c) Intellect
   d) Skills
2. Negative thinking about yourself will lead to _____.
   a) Confidence
   b) Insecurity
   c) Success
   d) Happiness
3. Sharing information in the terminology of Johari's window is called as _____.
   a) Feedback
   b) Reply
   c) Communication
   d) Self disclosure
4. _____ is not a type of non verbal communication.
   a) Facial expressions
   b) Gesture
   c) Touch
   d) Talking
5. Before going for a presentation know your _____.
   a) Friends
   b) Neighbours
   c) Yourself
   d) Audience

B. Fill in the blanks: **(5)**

[Red, blue, panel, SWOT, group, debate, hearing, listening]

1. _____ Hat is used for coming to conclusion.
2. _____ Analysis helps in evaluating oneself.
3. _____ Discussions are organised for the benefit of the audience.
4. _____ is a verbal communication.
5. _____ is a voluntary activity.

C. Define in one or two lines: **(5)**

1. BATNA
2. Resume
3. Stress
4. Time management
5. Communication

Q2. Attempt the following (ANY THREE): **(15)**

1. Explain Johari's window in detail.
2. State and explain the five essential things which one should know about oneself.
3. What are the five roles played by non verbal cues?
4. Distinguish between EQ and IQ.
5. Write the social media etiquettes which should be followed professionally.

Q3. Attempt the following (ANY THREE): **(15)**

1. Explain the process of communication with diagram.
2. What are the fundamentals of Good Listening?
3. What are the do's and don'ts of a resume?
4. Discuss ways to combat stage fright and deliver a perfect presentation at the workplace.
5. Stress interview

Q4. Attempt the following (ANY THREE) **(15)**

1. Explain the Six Thinking Hats technique.
2. How can an organisation nurture ethics?
3. Suggest some measures to combat stress.
4. Name and explain some online learning programmes.
5. Write down the Preparatory steps for Job Interviews.

Q5. Attempt the following (ANY THREE) **(15)**

1. What are the 4 Ds of Email Decision Making?
2. Explain Dr.Eric Berne's four attitudes which people generally have towards their life.
3. Importance of feedback for effective communication.
4. What are the three main parts of a cover letter?
5. Write down some interview skill tips during the interview.