FEDERAL PUBLIC SERVICE COMMISSION

COMPETITIVE EXAMINATION FOR

RECRUITMENT TO POSTS IN BS-17

UNDER THE FEDERAL GOVERNMENT, 2017

Roll Number

COMPUTER SCIENCE

TIME ALLOWED:	**(PART-I MCQs)**	**30 MINUTES**	**MAXIMUM MARKS: 20**
THREE HOURS	**(PART-II)**	**2 HOURS & 30 MINUTES**	**MAXIMUM MARKS: 80**

NOTE: (i) Part-II is to be attempted on the separate Answer Book.
(ii) Attempt ONLY FOUR questions from PART-II by selecting TWO questions from EACH SECTION.
(iii) All the parts (if any) of each Question must be attempted at one place instead of at different places.
(iv) Candidate must write Q. No. in the Answer Book in accordance with Q. No. in the Paper.
(v) No Page/Space be left blank between the answers. All the blank pages of Answer Book must be crossed.
(vi) Extra attempt of any question or any part of the attempted question will not be considered.

PART-II

SECTION-A

Q. 2. **(a)** The internet era has given rise to the problem of cybercrimes. Given the need to maintain privacy which is an ethical responsibility of the government, what technical means would you suggest to curb this problem? **(8)**

(b) Describe the difference between Harvard and Von-Neumann architectures of computers. Also discuss their traits in the light of their capabilities. **(6)**

(c) Virtual memory is used by the computer to support the running of heavy applications. Describe the functioning of virtual memory in the computer. Also comment on the management of virtual and physical memory by an operating system. **(6)**

Q. 3. **(a)** Three types of languages exist for use in programming of computers, Machine, Low Level and High Level languages. Elucidate on these three types, giving details of the conversion process between Low Level and High Level language into Machine language. **(8)**

(b) Write a function that calculates the quadratic equation in $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. You may use the math library for this purpose. The program should ask the user to enter values of a, b and c and should print the result. A sample execution of the program is shown below: **(6)**

```
Enter value of a: 1
Enter value of b: 2
Enter value of c: 1
The values of x are -1, -1
```

(c) Consider that you are required to create a program for a supermarket checkout machine. The machine has a database of the items available in the supermarket which consists of the items name, code and price. Make a program that requires the cashier (user) to enter the code or name of the product and the quantity that has been bought. It should allow for multiple entries to be made. Once all the entries have been made. The program prints the total amount to be charged on the screen. A sample execution is shown below: **(6)**

```
Enter product name or code: 1
Enter quantity: 1
Do you have more products to add (Y/N): N
The total amount is 500
```

You may construct the database as a structure.

Q.4. **(a)** What factors should be considered when choosing particularly between evolutionary and incremental models? Elucidate the characteristics of Rapid Application Development, Joint Application Development and Agile Software Engineering. **(8)**

(b) Differentiate between Software Validation and Verification. Discuss some of the techniques used for empirical software evaluation. **(6)**

(c) Discuss the importance of Requirements Engineering in the success of a software project. Explain in detail the process of 'Requirements Sign-off'. **(6)**