B.Sc. (Hons.) SEMESTER VI EXAMINATION 2019-20
COMPUTER SCIENCE
CS – 205 : Software Engineering

Time : Four hours   Max. Marks : 70

Instructions

1. The Question Paper contains 08 questions out of which you are required to answer any 04 questions. The question paper is of 70 marks with each question carrying 17.5 marks.

   प्रश्नपत्र में आठ प्रश्न पूँछे गये हैं जिनमें से 4 प्रश्नों का उत्तर देना है। प्रश्नपत्र 70 अंकों का है, जिसमें प्रत्येक प्रश्न 17.5 अंक का है।

2. The total duration of the examination will be **4 hours** (Four hours), which includes the time for downloading the question paper from the Portal, writing the answers by hand and uploading the hand-written answer sheets on the portal.

   परीक्षा का कुल समय 4 घंटे का है जिसमें प्रश्नपत्र को पोर्टल से डाउनलोड करना, हस्तलिखित प्रश्नों का उत्तर पोर्टल पर अपलोड करना है।

3. For the students with benchmark disability as per Persons with Disability Act, the total duration of examination shall be **6 hours** (six hours) to complete the examination process, which includes the time for downloading the question paper from the Portal, writing the answers by hand and uploading the hand-written answer sheets on the portal.

   दिव्यांग छात्रों के लिये परीक्षा का समय 6 घंटे निर्धारित हैं जिसमें प्रश्नपत्र को पोर्टल से डाउनलोड करना एवं हस्तलिखित उत्तर को पोर्टल पर अपलोड करना है।

4. Answers should be hand-written on a plain white A4 size paper using black or blue pen. Each question can be answered in upto 350 words on 3 (Three) plain A4 size paper (only one side is to be used).
   हस्तलिखित प्रश्नों का उत्तर एक सादे सफेद A4 साइज के पन्ने पर काले अथवा नीले कलम से लिखा होना चाहिये। प्रत्येक प्रश्न का उत्तर 350 शब्दों अथवा A4 साइज के तीन पृष्ठों का होना चाहिये। प्रश्नों का उत्तर कापी के केवल एक पृष्ठ पर ही लिखना है।

5. Answers to each question should start from a fresh page. All pages are required to be numbered. You should write your Course Name, Semester, Examination Roll Number, Paper Code, Paper title, Date and Time of Examination on the first sheet used for answers.
   प्रत्येक प्रश्न का उत्तर नये पृष्ठ से शुरू करना है। सभी पृष्ठों को पृष्ठांकित करना है। छात्र को प्रथम पृष्ठ पर प्रश्नपत्र का विषय, सेमेस्टर, परीक्षा अनुक्रमांक, प्रश्नपत्र कोड, प्रश्नपत्र का शीर्षक, दिनांक एवं समय लिखना है।

Questions

1. (a) What are the major phases in the entire life of the software? Which phase consumes the maximum effort? (5+1=6)

   (b) Which of the process models will you follow for the following projects? Give justifications. (6)

   (i) A simple data processing project.

   (ii) A data entry system for office staff that have never used computers before. The user interface and user-friendliness are extremely important.

   (iii) A new system for comparing finger prints. It is not clear if the current algorithms can compare finger prints in the given response time constraints.

   (iv) An online inventory management system for an automobile industry.

   (v) A flight control system with extremely high reliability.

   (vi) A new missile tracking system. It is not known if the current hardware/software technology is mature enough to achieve the goals.

   (c) List the reasons for software crisis. (5.5)

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2. (a) List the important issues which a SRS document must address. (5)
   (b)What is structured analysis? Briefly review the tools used. (7)
   (c)How information can be gathered in requirement analysis phase? (5.5)

3. (a) What is difference between coupling and cohesion modular software design? (8)
   (b) Distinguish between object oriented and function oriented design? (5.5)
   (c)What are the uncertainties in software cost estimation? (4)

4. (a) What is role of cyclomatic complexity ? Compute cyclomatic complexity for following code: - (3+5=8)

```
0. begin
1.  i=1
2. while(i<=n) do begin
3.   j=l;
4.   while(j<=i) do
5.     ifA[j]<A[i] then
6.        swap (A[j],A[i]);
7.     endif
8.   endwhile
9. endwhile
10.end;
```

   (b) What is debugging and also explain different debugging approaches. (5)
   (c)What is role of object oriented analysis in software engineering? (4.5)

5. (a) What is difference between functional and structural testing? (8)
   (b) How is stress testing different from volume testing? (2.5)
   (c) What are the objectives of testing? What is difference between alpha and beta testing? (4+3=7)

6. (a) What is software maintenance? Also discuss the problem associated with software maintenance. (4+4=8)
   (b) Why do we need software configuration management? (6)
   (c) Distinguish between top down and bottom up design. (3.5)

7. (a) What is purpose of risk analysis in software engineering? Write about various types of risks. (5+5=10)
   (b) What are the essential elements of component based software engineering? (4.5)
   (c) What is use of COCOMO model? (3)

8. (a) Why is software reliability important? How one can measure software reliability and availability? (4+4=8)
   (b) Write activities involved in software project planning? (5)
   (c) How well software reuse concepts will be helpful for software development industries? (4.5)

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