BI BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF SCIENCE AND ENGINEERING

DEPARTMENT OF COMPUTER SCIENCE

BSc HONORS DEGREE IN COMPUTER SCIENCE / SOFTWARE ENGINEERING / ELECTRONIC ENGINEERING

CS216 / CSH116 / SWE115 / EE1205 - SOFTWARE ENGINEERING

2 HOURS 30 MINUTES

INSTRUCTION TO CANDIDATES

Answer **all** questions. Total marks are **100**.

Question 1

a) Describe each of the **five (5)** stages of the waterfall model. **[10]**

b) Discuss the extent to which each of the following statements about the agile approach to software development is true:

i. Agile development does not require planning or documentation, which is why it delivers systems faster than the traditional approach. **[5]**

ii. In the traditional waterfall life cycle, it is not possible to go back to an earlier stage. With Agile, however, it is always easy to change anything. **[5]**

Question 2

a) State any **two (2)** possible advantages and **two (2)** possible disadvantages in using an incremental approach to project delivery. **[8]**

b) Outline the benefits of developing a software prototype early in the development process. **[4]**

c) Discuss the potential advantages and disadvantages of using Commercial-Off-The-Shelf (COTS) software products as the basis for software re-use. **[8]**

Question 3

For each of the following software development projects, identify an appropriate life cycle for the project to follow, and discuss the reasoning behind your selection.

a) The development of a smart phone calendar app by a small team. The user interface of the app will be very important to the client. **[4]**

b) The development of a complex, safety-critical system to control a power station. A large team of developers will be involved. **[4]**

c) The development of an individual student project as part of a diploma. The student has not developed a program like this before, but a working program must be ready in 6 months. **[4]**

d) As part of an incremental testing strategy, integration testing (often referred to as 'smoke testing') is used. Explain the particular benefits in using integration testing for complex or time-critical software development projects. **[8]**

Question 4

a) Developers can make use of CASE Tools along the SLDC. Using examples explain what you understand about CASE Tools. **[4]**

b) Why are these CASE Tools Important? **[6]**

c) Study Table 4.1 below and answer the question that follow:

Table 4.1: Dependencies

Task	Duration (days)	Dependencies
T1	10	
T2	15	T1
T3	10	T1,T2
T4	20	
T5	10	
T6	15	T3,T4
T7	20	T3
T8	35	T7
T9	15	T6
T10	5	T5,T9
T11	10	T9
T12	20	T10
T13	35	T3,T4
T14	10	T8,T9
T15	20	T12,T14
T16	10	T15

Table 1 shows several activities, durations, and dependencies. Draw a Gantt chart showing the activity schedule. **[10]**

Question 5

a) Define the term software process improvement. **[1]**

b) Describe how the following methods are used in software product maintenance:

i. Corrective maintenance. **[3]**

ii. Adaptive maintenance. **[3]**

iii. Perfective maintenance. **[3]**

c) A software specification contains 3 requirements (R1, R2 and R3), and the creation of 4 components (C1, C2, C3 and C4). The requirements and components are linked as follows:

- R1 requires (C1, C2)
- R2 requires (C1, C3)
- R3 requires (C3, C4)

Using an incremental approach, and three iterations, describe how the components will be built, integrated, and released in a product for each iteration. **[10]**

*****************END OF PAPER****************