ii.   Fill in the gaps with an appropriate word or phrase, or select the correct one of the indicated choices:

A class encapsulates the behaviour and properties of a number of [_____]. The members of a class are also referred to as [_____]. The minimum number of instances of a class is [_____], the maximum is [_____]. In object-oriented design, an object [can/cannot] be an instance of more than one class, and an object [can/cannot] change which class it is an instance of.   [8]

iii.   Redraw the contract-subcontract relationship shown below so that it does not use a self-association.   [4]

iv.   Do you think your model is more or less expressive in this form?   [4]

Question 4

i.   Draw a state diagram for a weather station   [10]

i.   Explain two reasons for the need of prototyping in software development   [4]

ii.   Explain three requirements elicitation process   [6]

Question 5

i.   Why is it not practically possible to test every logical path through a piece of software? What alternatives are there?   [9]

ii.   Based on your experience with a bank ATM, draw an activity diagram that models the data processing involved when a customer withdraws cash from the machine.   [11]

END OF EXAMINATION

BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF SCIENCE EDUCATION

DEPARTMENT OF EDUCATIONAL TECHNOLOGY

BACHELOR OF SCIENCE EDUCATION IN COMPUTER SCIENCE

CS216/EDT216: SOFTWARE ENGINEERING

TIME: 3 HOURS   JAN 2025

INSTRUCTIONS

Answer **ALL the questions.** Each question carries **20** marks.

The question paper has **5** questions

Question 1

Draw a labelled diagram of a spiral Model of software development and explain what happens in each quadrant   [20]

Question2

i.   Describe **one** example from your own experience of each of the following types of systems:
- Real-time systems   [2]
- Data-processing systems   [2]
- Decision-support systems   [2]
- Expert systems   [2]

ii.   What is requirements engineering?   [2]

iii.   Construct a use case model that shows the requirements of a computer system that will automate the services of a large lending library. Assume that the library has separate adult and child services, orders its own books stocks, can obtain books from other libraries on request, has a catalogue on public access, and charges fines for overdue returns. Try to envisage all the services and users of the library, and capture them all in the diagram. Do not include services that don't relate to books (e.g., Internet access).   [10]

Question 3

i.   State two roles models play in analysis and design?   [4]