BENNETT UNIVERSITY
THE TIMES GROUP

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END-TERM EXAMINATION, ODD SEMESTER DECEMBER 2023

COURSE CODE	**CSET205**	**MAX. DURATION**	**2 HRS**
COURSE NAME	**Software Engineering**		
PROGRAM	**B.Tech.**	**TOTAL MARKS**	**35**

Mapping of Questions to Course and Program Outcomes									
Q. No.	A1	B1	B2	B3	B4	C1	C2	C3	C4
CO	1	2	2	3	2	3	3	2	2
PO	1, 3, 5, 9	1, 3, 5, 9	1, 3, 5, 9	1, 3, 5, 9	1, 3, 5, 9	1, 3, 5, 9	1, 3, 5, 9	1, 3, 5, 9	1, 3, 5, 9
BTL*	L1	L3	L6	L4	L2	L6	L6	L3	L5

GENERAL INSTRUCTIONS:

1. Do not write anything on the question paper except **name, enrolment number** and **department/school.**
2. Carrying mobile phones, smartwatches and any other non-permissible materials in the examination hall is an act of **UFM.**

COURSE INSTRUCTIONS:

a) All Questions are mandatory.

b) Draw clear diagrams, wherever it is required.

c) Read the question carefully before attempting.

SECTION A

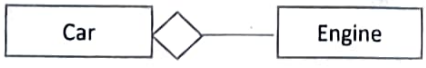
Max. Marks: 7

A1) Attempt all questions.

(1 x 7 = 7 Marks)

i) Which type of diagram belongs to the behavioural UML Diagram.

ii) Identify the relationship between Car class and Engine class.



iii) Draw a suitable symbol that can be used as start of an activity in the activity diagram.

iv) Give the name of the symbol that represents conditional statement in activity diagram.

v) Suggest the name of main branch in GIT.

vi) Which phase of the Spiral Model focuses primarily on understanding project objectives and identifying potential constraints.

vii) A program validates numeric fields as follows: values less than 10 are rejected, values between 10 and 21 are accepted, and values greater than or equal to 22 are rejected. Suggest the suitable input values that covers all the equivalence partitions? Find the correct answer.

x) Which type of complexity is defined using formula (C = E - N + 2P). Give the name.

SECTION B

Max Marks: 12

B1) A software development company is planning on a new software project for Air Traffic Control, which requires highly experienced developers. The software will have communication with several hardware components. The software project consists of the following modules:

Module	LOC
M1	40000
M2	34233
M3	23999

Using the basic COCOMO model to estimate the effort, development time, and average staff size of the project. **(3 Marks)**

B2) Consider the given code:

```
while (i<n-1) do
        j = i + 1;
        while (j<n) do
                if A[i]<A[j] then
                        swap(A[i], A[j]);
                end if
        end do;
        j=j+1;
end do;
```

(i) Draw and express the complexity Graph. **(2 Marks)**
(ii) Estimate the cyclomatic complexity of the graph (show calculation). **(1 Marks)**

B3) The activity is started by a Commuter actor who needs to buy a ticket. The ticket vending machine will request trip information from the Commuter. This information will include the number and type of tickets, *e.g.* whether it is a monthly pass, one-way or round ticket, route number, destination or zone number, etc. Based on the provided trip info ticket vending machine will calculate the payment due and request payment options. Those options include payment by cash, or by credit or debit card.

If payment by card was selected by the Commuter, another actor, the bank will participate in the activity by authorizing the payment.

You are part of a team in a service-based company. Your company is developing a Ticketing System. Draw an activity diagram that demonstrates the process of purchasing a Ticket from the Ticket Vending Machine.

(3 Marks)

B4) You are part of a requirement-gathering team. Your team has completed the requirement meeting with your customer, who needs an Online skilled-based betting App. Describe TWO user stories and corresponding acceptance criteria [one for each].

(3 Marks)

SECTION C

Max. Marks: 16

C1) You are part of a team in a Tech company. Your company has a project to develop software that can manage Railway stations and train information.

There are two types of Trains: Passenger and Goods. The train is made up of Coaches and Engines. There are the following types of Coaches: AC1, AC2, AC3, Sleeper, General. There are two types of Engines: Diesel, and Electric. A railway station will have N number of platforms. Platforms may have escalators. Railway stations will have different types of ticket counters (General, Reservation, Platform). Railway stations may have waiting rooms.

Design a class diagram that uses the key classes and their relationships in this software. Also, add a few attributes in each class.

(4 Marks)

C2) You are the project manager for an Online Job Portal App. Draw a use case diagram for this system and interpret it. Also, identifying the various actors and use cases involved.

(4 Marks)

C3) A software system calculates the salary of an employee based on the following formula:

Salary = Hours worked * Hourly wage

The hourly wage can range from $10.00 to $50.00 (Float), and the hours worked can range from 1 to 40 (Integer value only). Apply Robust Boundary Value Analysis.

(i) Draw suitable 2D graph for the given problem. **(2 Marks)**
(ii) Express all the identified test cases from the graph. **(2 Marks)**

C4) solve the given code coverage questions.

C4.1) A code snippet is given to you:

a. Read A, B
b. IF A > B THEN
c. C = A – B
d. ELSE
e. C = A + B
f. ENDIF
g. Read D

4 1111

```
h. IF C == D
i.     Then Print "Error"
j. ENDIF
```

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(i) Interpret the test cases required to achieve 100% statement coverage. The set of test cases must be minimum. **(1 Mark)**

(ii) List the statements executed by each test case. **(1 Mark)**

C4.2) Consider the following code snippet

```
a. num = int(input('enter number'))
b. flag = False
c. if num == 1:
d. print('not a prime number')
e. elif num > 1:
f. for i in range(2, num):
g. if num%i == 0:
h. flag = True
i. break
j. if flag:
k. print('not a prime number')
l. else:
m. print('prime number')
```

Two Test cases are given to you as follows:
Test Case 01: num = 1 Test Case 02: num = 5

Show statement coverage percentages in both the cases separately to implement it effectively. **(2 Marks)**

-ALL THE BEST-