Roll No: ...196121019.....

Cycle Test 1 – Semester IV
CSPE41 – Software Engineering

Date & Time: 11 March 2023, 11 PM – 12 Noon Faculty: C. Oswald || Max. Marks: 20
Batch: 2021 CSE

Note: Read the questions carefully. Your *logic* is more important than the answer.
Present your content as per the marks given.

What is your source (class notes, text books, internet) of preparation for CSPE41? (**0** mark)

1. Rajasri runs an organization named 7th Sense Technologies and she has got four different customers for new projects with the following scenarios. Help her by suggesting the **best** suited software life cycle model and justify in two sentences. (**2** marks)
   i) Complex system
   ii) Short time schedule
   iii) Visibility to stakeholders
   iv) Strong documentation required

2. Identify the type of coupling/cohesion and justify in two sentences. (**1** mark)
   a. A login page where the login module and the backend module are interdependent, as the login validation happens both in the login page level and the backend database level.
   b. Your CT-1 marks are the input of the report generator in faculty's MIS portal that produces a report in PDF format (and optionally the raw data can be generated in a Json file). A template is provided for this generator.

3. Briefly mention any two aspects of agile software development that don't work well on very large software projects, and identify alternative strategies that can be used in their place. At what size of project do you expect such problems to kick in? (**1.5** mark)

4. Select the best answer/s: (**3** marks)
   a. Choose the four framework activities found in the Extreme Programming (XP) process model?
      i) planning, analysis, design, coding, ii) analysis, design, coding, testing
      iii) planning, design, coding, testing, iv) planning, analysis, coding, testing
   b. The _____ model/s is preferred for software development when the requirements are not clear
      Waterfall Model, Prototype Model, Evolutionary Model, SCRUM, Component-based software engineering, Spiral, Waterfall
   c. What is the ideal sprint length?
      i) 30 weeks ii) 4 days iii) 4 weeks iv) 20 days
   d. Which of the following is incorrect about Waterfall Model for S/W development?
      i) Requirements need to be frozen before the project development starts
      ii) High costs are incurred in developing custom applications.
      iii) Customers can interact easily with the development team and check progress.
      iv) Difficulty in accommodating changes during development
   e. Which of the following is not a property of a good SRS document?
      i) Provides a functionally independent set of modules, ii) Form the starting point for development
      iii) Provides a basis for estimating costs and schedules, iv) Provides a basis for validation and verification

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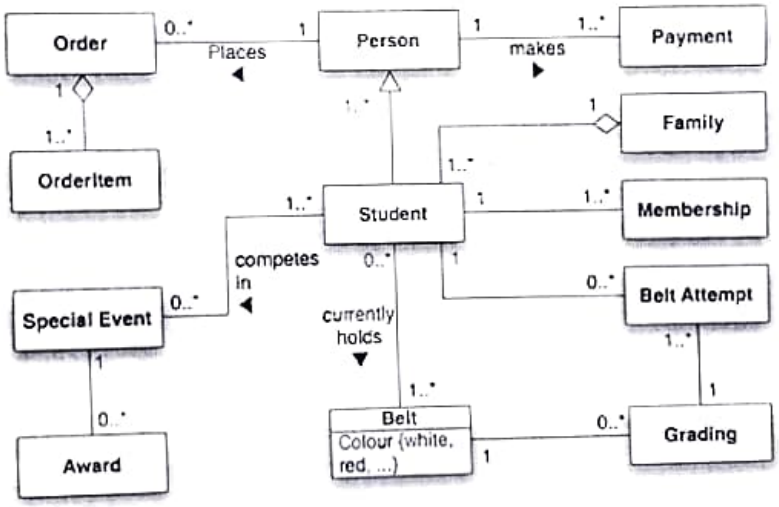
f. Which of the following is not an objective of high level design activity?

i) To design the layering of components of the system.
ii) To identify the important components of system.
iii) To identify the call relationship between various components.
iv) To design the algorithm used in different components.

5. Answer in a word or two. (2 marks)
   a. If multiple clients require the same operations, it should be specified in each of the specialized interfaces. What is the name of the design principle which states this?
   b. _____ diagram represents all data objects that are entered, stored, transformed, and produced within an application.
   c. Cohesion and coupling were discovered in the year _____.
   d. "The classes that are reused together should not be grouped together". True or False.

6. Match the following: (1 mark)
   a. Pareto - Interface design
   b. Christel and Kang - 80-20 principle
   c. Mitch Kapor - elicitation
   d. Theo Mandel - Design manifesto

7. The following domain model captures some basic information about a kids' karate club. In answering the following questions, state any assumptions that you make.



   a. How many times can a student attempt to earn a Black belt? (1 mark)
   b. What are the inference/implications of the multiplicities on the association between Person and Payment? (1 mark)
   c. The model distinguishes between 'student' and 'person'. Why do some associations go to 'Student', and some to 'Person'? Are these modeling decisions sensible? (1 mark)
   d. The owner of the club wants to offer a family discount, so that if more than one student from the same family is a member of the club, they each get a 10% discount. How would you alter the model to capture this? (2 marks)

8. Consider the code below:

```
class BudgetReport {
        void connectToRDBMS() { }
        void generateBudgetReport() { }
        void saveToFile()   { }
        void print() { }
                }
```

Now imagine your manager Dr. Arnab Bhattacharya comes along and says, "Hey you know that accounting application we're working on? The clients just decided that they're also going to want to generate a revenue projection report, oh and they want to do some inventory reporting also. They do like our reporting features however, so make sure that all of these reports will let them choose a database, choose a printer, and save generated reports to data files..." Ouch!
Help your manager by modifying the existing code into a highly reusable code of better design.
Hint: Think of Cohesion. **(1.5 marks)**

9. List any two ambiguities or omissions in the following statement of SRS for part of a ticket-issuing system. (1 mark)
An automated ticket-issuing system sells rail tickets. Users select their destination and input a debit card and a personal identification number. The rail ticket is issued and their debit card account is charged. When the user presses the start button, a menu display of potential destinations is activated, along with a message to the user to select a destination. Once a destination has been selected, users are requested to input their debit card. Its validity is checked and the user is then requested to input a personal identifier. When the debit transaction has been validated, the ticket is issued.

10. Construct the Control Flow Graph (CFG) for the following pseudocode. **(2 marks)**

```
stcode getlist (char *lin, *i, stcode, *status)
1   {
1    int num, done;
1    line2 = 0;
1    nlines = 0;
1    done = {getone(lin, i, &num, status) ! =OK);
2    while(!done)
3    {
3      line1 = line2;
3      line2 = num;
3      nlines++;
3      if(lin[+i]==SEMICOL)
4        curln = num;
5      if ((lin[+i] == COMMA) || (lin[+i] == SEMICOL))
6      {
6        *i = *i - 1;
6        done = (getone(lin, i, &num, status) ! =OK);
6      }
7      else
7        done = 1;
8   }
9   nlines = min(nlines, 2);
9   if (nlines == 0)
10    line2 = curln;
11  if (nlines <= 1)
12    line1 = line2;
13  if (*status != ERR)
14    *status = OK;
15  return (*status);
16  }
```

END