

[This question paper contains 8 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 1370 **A**

Unique Paper Code : 32341402

Name of the Paper : Software Engineering (DSC)

Name of the Course : B.Sc. (H) Computer Science

Semester : IV

Duration : 3 Hours

Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. The paper has **Two** Sections.
3. All questions in '**Section A**' are compulsory.
4. Attempt any **Four** questions from '**Section B**'.
5. Parts of a question must be answered together.

SECTION A

1. (i) What is a prototyping model? When is it most appropriate to use prototyping model? (1+2)

P.T.O.

- (ii) What is Gantt chart? How is it used for project scheduling? (1+2)
- (iii) What is an SRS? List any 3 characteristics of SRS. (1+3)
- (iv) State three basic assumptions which an agile process is expected to handle. (3)
- (v) What is risk exposure? How is Risk Exposure determined? (1+2)
- (vi) What do you understand by CMMI? Explain the various levels of CMMI. (5)
- (vii) "Software Engineering is a layered technology". Justify the given statement. (5)
- (viii) Explain any two development activities defined by the process patterns used in Scrum. (4)
- (ix) What is Cohesion? Explain any three different types of cohesion. (2+3)

SECTION B

2. Explain the following terms : (10)

- (i) Known requirements

- (ii) Unknown requirements
- (iii) Undreamt requirements
- (iv) Functional requirements
- (v) Non-functional requirements

3 The given system computes the salary of the employees and generates the salary slip. Create context level and level 1 DFD (Data Flow Diagram) of the given system.

Also draw the data dictionary of the system.

- The basic input is the weekly timesheet
- The source for the input is a worker
- The basic output is the pay-check
- The sink for the output is also a worker

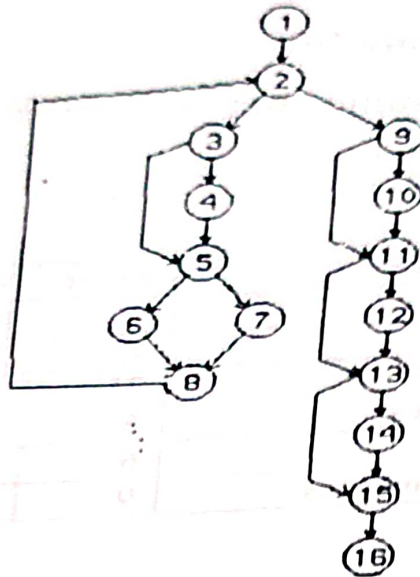
Procedure :

- In this system, first the employee's record is retrieved, using the employee ID, which is contained in the timesheet.

P.T.O.

- From the employee record, the rate of payment and overtime are obtained.
- These rates, and the regular and overtime hours are used to compute the pay.
- After the total pay is determined, taxes are deducted.
- To compute the tax deduction, information from the tax rate file is used.
- The amount of tax deducted is recorded in the employee and company records.
- Finally, the pay-check is issued for the net pay.
- The amount paid is also recorded in the company records. (10)

4. Compute the **Cyclomatic Complexity** of the given flow graph using three different methods. Identify all the regions and list all the **independent paths** of the flow graph : (10)



5. (a) How are maintainability and integrity of the software used as a measure of software quality? (6)

(b) Explain the following metric to determine the specification quality :-

(i) Specificity

(ii) Completeness of the functional requirement (4)

6. (a) Compute the **Function Point value** for a project with the following information domain characteristics :

P.T.O.

Assume the measurement parameters are equally divided among low, average and high complexity. Further, assume that the complexity adjustment value is 1.05. (5)

Measurement Parameters	count	Weighing factors		
		Low	average	high
Number of user inputs	12	3	4	6
Number of user outputs	21	4	5	7
Number of user inquiries	6	3	4	6
Number of files	6	7	10	15
Number of external interfaces	9	5	7	10

(b) At the conclusion of a project, it has been determined that 30 errors were found during the modelling activity and 12 errors were found during the construction activity that were traceable to errors that were not discovered in the modelling activity. What is the DRE for the modelling activity? (5)

7. (a) Draw a use case diagram for an online shopping portal "ESHOP". The functional requirements are as given below :

- The users will log in and the Admin will authenticate the log in details of the user.

1370

- After successful log in users can select the product to purchase and keep them in cart.
- They can view and edit the cart items.
- To place the order user has to calculate the total amount to be paid which is verified by the admin.
- After verification the payment can be done through credit card.
- The payment receipt is sent on mail to user.

(6)

(b) Consider a program for computing the function $f(x,y)$, where the input boundaries of x and y are given below :

$$1 \leq x \leq 10$$

$$10 \leq y \leq 20.$$

Design the boundary value test cases for the above program.

(4)

8. (a) What is top down and bottom approach for integration testing? Explain the use of Stubs and Drivers in the context of Integration Testing. Illustrate with an example.

(6)

- (b) Explain any FOUR key quality attributes as identified by ISO 9126 standards. (4)