Note: Attempt any five questions including Q no.1 which is compulsory.

Semester

Subject

Q1. Define the following terms and explain with example:-   (10x2.5=25)

(a) Discuss characteristics of a software product and elaborate how it is different from hardware.

(b) Differentiate between Function Point and LOC software metrics.

(c) Compare functional and non functional requirements.

(d) What are the different activities during software project planning?

(e) Differentiate between object oriented design and function oriented design.

(f) What is software failure? How it is related with fault?

(g) Differentiate between verification and validation.

(h) Compare reverse engineering and re-engineering.

(i) What are stubs and drivers?

(j) Explain CMMI Modeling.

Q2 (a) Discuss the selection process parameters for a life cycle model. Give suitable examples.   (4)

(b) Critically compare and draw waterfall, evolutionary and spiral models.   (8.5)

Q3 (a) What is the signification of Information flow metric/ Explain sophisticated information flow model.   (6)

(b) Consider the code given below. Calculate Halstead software science metrics vocabulary, length and volume.   (6.5)

```
Main()
{
int x,y,z;
Scanf("%d%%d", &x,&y,&z);
Prod=(x*y*z);
Printf("Product of three numbers is: %d",prod);
}
```

Q4 (a) Create Entity Relationship Diagram (ER Diagram and Data Flow Diagram (DFD) for Library management systems. Make assumptions and clearly state them-   (5)

(b) Consider a large scale project for which manpower requirement is K=800 PY and the development time is 3 years 6 months.   (7.5)

(i) Calculate the peak manning and peak time

(ii) What is the manpower cost after 1 year and 2 month?

(iii) Calculate difficulty and manpower buildup

Q5 (a) What are the risk management activities? Give top five risks in case of software development. (3)

(b) Explain effect of high/low cohesion and high/low coupling on software product. (2)

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(ii) Content coupling
(iii) Functional cohesion
(iv) Procedural cohesion

(a) How testing, reliability and quality of software are related to each other? (2.5)

(b) Suppose the initial failure intensity is 50 failure/CPU hours, the failure intensity decay parameter is 0.01/failure. We assume that 100 failures have been experienced. Calculate: (6)
(i) Current intensity
(ii) Decrement of failure intensity per failure
(iii) Number of failure experienced for the logarithmic Poisson model at 50 CPU hours of executions.

(c) Consider a program for the determination of the nature of roots of a quadratic equation. Design the boundary value test cases for it. (4)

7 (a) Explain the Boehm's maintenance model with the help of a diagram. (4)

(b) The development effort for a project is 600 PMs. The empirical determined constant (K) of Belady and Lehman model is 0.5. The complexity of code is very high and is equal to 7. Calculate the total effort expended (N) if maintenance team has reasonable level of understanding of the project. (2.5)

(c) Write short notes on following:- (2+2+2=6)
(i) Mutation testing
(ii) Cyclometic complexity.
(iii) User documentation vs System documentation

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