END TERM EXAMINATION

FIFTH SEMESTER [B.TECH] NOVEMBER - DECEMBER 2018

Paper Code: ETCS-303	Subject: Software Engineering
Time: 3 Hours	Maximum Marks: 75

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

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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(c) What is modularity? Explain the following with example: **(7.5)**
    (i) Stamp coupling
    (ii) Content coupling
    (iii) Functional cohesion
    (iv) Procedural cohesion

Q6 (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)**

Q7 (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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FIFTH SEMESTER [B. TECH] NOVEMBER - DECEMBER 2017

Paper Code: ETCS-303	Subject: Software Engineering

Time: 3 Hours   **Maximum Marks: 75**

Note: Attempt all questions as directed. Internal choice is indicated.

Q1   Attempt **any five** questions from the following: **(5x5=25)**
  (a) What are the Components of a Software? Discuss how Software Offers from a Program?
  (b) What is the difference between Line Variable and Variable Span? Explain Capability Maturity Model in brief?
  (c) Define module cohesion and explain different type of cohesion? High level of cohesion and low Level of coupling is required for good quality design. Why and how?
  (d) What is the unique Characteristic of Spiral process Model which are not present in other models?
  (e) Distinguish Functional and Non-Functional Requirement for the Case of banking System?
  (f) Point out the shortcoming of the ISO 9001 certification as applied to the Software Industry. Explain the main features of CMM?

Q2   Attempt **any one** of the following.
  (a) Define the term "Software Engineering". Explain the major difference between software Engineering and other traditional engineering disciplines?   **(4)**
  (b) Discuss the Prototyping Model. What is the effect of designing a prototype on the overall cost of the project?   **(4)**
  (c) What are the different activities of spiral model. Why it is considered as Complex process Model?   **(4.5)**

Or

  (a) Compare iterative enhancement model and evolutionary process model?   **(4)**
  (b) What are the Components of Software? Discuss how Software differs from a program?   **(4)**
  (c) Explain different types of empirical cost estimation models?   **(4.5)**

Q3   Attempt **any one** of the following.
  (a) Compute the function point value for a project with the following information domain characteristics.   **(6.5)**
  Number of user inputs=24
  Number of user outputs=65
  Number of user enquires=12
  Number of files=23
  Number of External interfaces=7
  Assumes that all Complexity adjustment values are moderate. Explain
  (b) Explain the SDLC model in software development process. Describe waterfall model   **(6)**

Or

  (a) Explain COCOMO model for cost estimation. What is the limitation of COCOMO models?   **(6.5)**

ETCS-303

(b) Distinguish between ER Diagram and DFD. Draw a DFD of any suitable example as per your choice? **(6)**

Q4 Describe the role and use of coupling and cohesion in software design process through an example. Enumerate different types of coupling and cohesion? **(12.5)**

Q5 (a) What is the purpose of integration testing? How it is done? Differentiate between integration testing and system testing? **(4)**

(b) Compare Path Testing, Data flow testing and mutation testing? Why do we require these types of testing? **(4)**

(c) Explain the Concept of Maintenance. Describe the various categories of Maintenance? Explain any software maintenance model. **(4.5)**

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END TERM EXAMINATION

FIFTH SEMESTER [B.TECH.] DECEMBER 2016

Paper Code: ETCS-303	**Subject: Software Engineering**
Time: 3 Hours	**Maximum Marks: 75**

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

Q1 Short answer type-   **(5x5=25)**
   (a) Give the features of software characteristics. Draw the plot to indicate failure rate and time.
   (b) Distinguish between failure and faults.
   (c) Compare functional and behavioural analysis models.
   (d) Write short note on Spiral Model. Also discuss its merits and demerits.
   (e) What are the responsibilities and challenges of software engineers?

Q2 (a) What are the characteristics to be considered for the selection of the life cycle model?   **(6)**
   (b) Mention at least two reasons as to why classical waterfall model can be considered impractical and cannot be used in real projects.   **(6.5)**

Q3 (a) What are the different components of SRS document?   **(4)**
   (b) What are the benefits of ERD?   **(4)**
   (c) What are the objectives of Requirements Analysis? Different types of requirements.   **(4.5)**

Q4 (a) Write a note on Software Quality Assurance (SQA)?   **(4)**
   (b) Compare ISO and SEI-CMM models.   **(4)**
   (c) How do you define Reliability? Discuss various models for reliability allocation.   **(4.5)**

Q5 (a) Define the term coupling and cohesion? Explain various types of coupling and cohesion? How are there concepts useful in arriving at a good design of a system?   **(8)**
   (b) Explain with examples, top down and bottom-up approach in software design.   **(4.5)**

Q6 (a) What is software maintenability? How do you measure maintainability.**(4)**
   (b) What is Boehm's cost estimation model for software maintenance. Explain. **(4)**
   (c) Give the difference between Re-engineering and Reverse engineering. **(4.5)**

Q7 (a) Draw 0, 1 and 2 level DFD for university examination management system. **(5)**
   (b) Explain the Walston and Felix model.   **(3)**
   (c) Explain the prototyping model. What is the effect of designing a prototype on the overall cost of the project?   **(4.5)**

Q8 Write short notes on **any four** of the following:-   **(12.5)**
   (a) QFD and FAST techniques
   (b) Bath tub curve of hardware reliability
   (c) Various Risk Management Activities
   (d) Data Dictionary
   (e) Code inspection and code walk-through
   (f) Equivalence Class Testing and Integration Testing

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