



NATIONAL INSTITUTE OF TECHNOLOGY ROURKELA-769008
END-SEMESTER EXAMINATION, 2021
SESSION: 2021 – 2022 (Autumn)
B. Tech. 7th Semester / M. Tech. 1st Semester

Subject code: CS 6413
No. of pages: 5

Subject Name: SPPQM
Full Marks: 60 (40+20)

Dept. Code: CS
Duration: 2 hrs(1Hr 40 Mins +20 mins)

Subjective Questions (40 marks)
Figures at the right hand margin indicate marks.
Answer all questions.

Q.No.	Particulars	Marks																
1.	<p>(a) Identify and briefly discuss the factors that make software projects much more difficult to manage, compared to many other types of projects such as a project to construct a 10-storied building.</p> <p>(b) Compute the function point value for a project with the following information domain characteristics. Number of user inputs=22 Number of user outputs=15 Number of user inquiries=26 Number of files=46 Number of external interfaces=2 Assume all weighting factors to be average. The various complexity adjustment values are 3, 1, 1, 3, 2, 3, 4, 2, 4, 4, 3, 2, 4, 4.</p>	5x2=10																
2.	<p>Calculate the net profit, payback period, return on investment (ROI), and net present value (NPV) for the following Project A. Assume discount rate is 10%.</p> <table border="1"><thead><tr><th>Year</th><th>Project A (Rs.)</th></tr></thead><tbody><tr><td>0</td><td>-10,000</td></tr><tr><td>1</td><td>2,000</td></tr><tr><td>2</td><td>2,000</td></tr><tr><td>3</td><td>6,000</td></tr><tr><td>4</td><td>2,000</td></tr><tr><td>5</td><td>2,000</td></tr><tr><td>6</td><td>2,000</td></tr></tbody></table> <p>Give one disadvantage of NPV. Write down the name of one measure to overcome this disadvantage. Briefly explain this measure.</p>	Year	Project A (Rs.)	0	-10,000	1	2,000	2	2,000	3	6,000	4	2,000	5	2,000	6	2,000	10
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<p>3.</p> <p>(a)</p> <p>(b)</p>	<p>Assume that the size of a pay roll processing software has been estimated to be 40,000 lines of source code. Assume that the average salary of software engineers be Rs. 50,000/- per month. Determine the Effort, Development time and Cost required to develop the software.</p> <p>Suppose that a certain software product for business application costs Rs. 70,000 to buy off-the-shelf and that its size is 50 KLOC. Assuming that in-house developers cost Rs. 10,000 per programmer-month (including overheads), would it be more cost-effective to buy the product or build it? Justify your answer.</p>	<p>5x2=10</p>
<p>4.</p> <p>(a)</p> <p>(b)</p>	<p>For a project of 2,00,000 LOC embedded system, compute the effort and development time using intermediate COCOMO. Assume there are programmers of low quality, but high experience with the programming language, with all other attribute values being nominal. Value for low quality=1.17, value for high experience=0.95, nominal value=1.</p> <p>For the following C program, estimate the length, volume, effort and time using Halstead's software science.</p> <pre> /* Program to calculate GCD of two numbers */ int compute gcd(int x, int y) { while(x!=y) { if(x<y) then x=x-y; else y=y-x; } return x; } </pre>	<p>5x2=10</p>

Objective Questions (20 marks)

Answer All Questions.

Each correct answer will carry 1 mark and each wrong answer will attract -0.25 mark.

1. Business risk is related to
 - a. threats to successful project execution.
 - b. factors threatening the benefits of the delivered project.**
 - c. the potential design, implementation, interfacing, testing and maintenance problems.
 - d. none of the above
2. Which one of the following can be considered to be a project rather than a job?
 - a) Attend a lecture class
 - b) Buy a chocolate from the market
 - c) Book a railway ticket
 - d) Organize a wedding**
3. Which one of the followings is an indirect cost?
 - a. Insurance**
 - b. Development cost
 - c. setup cost
 - d. operational cost
4. Ram would like to invest some amount in mutual funds, for 4 years at 10% interest. At the end of 4th year, the future value of the invested money will be INR 1500. How much money he should invest now?
 - a. INR 1017 approx.
 - b. INR 1027 approx.**
 - c. INR 1037 approx.
 - d. INR 1047 approx.
5. Consider a company that has undertaken a software development project. Which of the followings is not an overhead?
 - a. Staff salary**
 - b. Cost of building,
 - c. Cost of lighting
 - d. Cost of networking
6. Which one of the following risk evaluation methods is suitable when it is required to evaluate whether the risk is important and, decide on a suitable course of action?
 - a. Risk identification and ranking
 - b. Cost-Benefit Analysis
 - c. Risk profile analysis
 - d. Using decision trees**

7. The projects based on collaboration by different organizations are referred to as
- Strategic programmes
 - Business cycle programmes
 - Research and development programmes
 - Innovative partnerships**
8. What is the fundamental measure of work?
- Cost
 - Size**
 - Effort
 - Duration
9. Which one of the followings is NOT a factor for "Lines of code" being considered a poor software size metric?
- It is programming language dependent.
 - It penalizes efficient and compact coding.
 - It is programmer dependent.
 - It is dependent on the complexity of the requirements.**
10. In which of the following estimation methods the cost of a project is computed by comparing the project to a similar project in the same application domain?
- Parametric Models
 - Basic Expert Judgment Technique
 - Analogy-Based Method**
 - Price to win
11. Consider a transaction project of 38,000 lines of code. Productivity is about 400 SLOC/person-month. What is the shortest time it will take to develop?
- 7 months (approx.)
 - 8 months (approx.)
 - 9 months (approx.)**
 - 10 months (approx.)
12. Which one of the followings is NOT a key component in function point analysis?
- External Inputs
 - External Outputs
 - External Inquiries
 - External operations**
13. Consider a project with the following functional units: 40 user inputs, 70 user outputs, 50 user enquiries, 10 user files, 4 external interfaces. What will be the unadjusted function points for the project?
- 705
 - 805
 - 838**
 - 938
14. Which one of the following function points is most suitable for embedded system development projects?
- IFPUG function points
 - Mark II function points
 - COSMIC function points**
 - None of these

15. Which one of the followings is an example of semidetached project?
- a. Accounting system
 - b. Compilers**
 - c. Operating systems
 - d. Real-time systems
16. Which one of the followings is an example of heuristic estimation technique?
- a. Expert judgement
 - b. Delphi cost estimation
 - c. COCOMO**
 - d. Halstead's software science
17. In intermediate COCOMO, if there are stringent reliability requirements on the product, then the initial cost and effort estimates obtained by the basic COCOMO, are
- a. scaled downwards
 - b. scaled upwards**
 - c. remained unchanged
 - d. none of the above
18. Which one of the following COCOMO estimation models considers the project as a collection of heterogeneous sub-systems?
- a. Basic COCOMO
 - b. Intermediate COCOMO
 - c. Complete COCOMO**
 - d. COCOMO 81
19. Which one of the following COCOMO II sub-models would be used once the system architecture has been designed and more information about the system is available?
- a. Application composition
 - b. Early design
 - c. Reuse
 - d. Post-architecture**
20. In Halstead's software science, program volume V is
- a. the minimum number of bits needed to encode the program.**
 - b. the maximum number of bits needed to encode the program.
 - c. the average number of bits needed to encode the program.
 - d. none of these

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