



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

Subject code: CS 6413
No. of pages: 3

Subject Name: SPPQM (Subjective Questions)
Full Marks: 80

Dept. Code: CS
Duration: 1hrs 45 mins

Figures at the right hand margin indicate marks.

Upload your answers in MS-TEAM within 10 minutes of completion of the examination.
Answer all questions.

Q. No.	Particulars	Marks
1. (a) (b)	Explain Montecarlo simulation approach, by clearly mentioning the steps. Write down the advantages of this approach. Suppose you are the project manager of a large software development project. List three common types of risks that your project might suffer. Point out the main steps that you would follow to effectively manage risks in your project.	10+10=20
2. (a) (b)	What are the different categories of resources? Briefly explain them. What is the final result of resource allocation? What do you understand by software configuration management? How is it carried out? What problems would you face if you are developing several versions of the same product according to a client's request and you are not using any configuration management tools?	10+10=20
3. (a) (b) (c)	Suppose a project is to be completed in one year at the cost of Rs. 2,00,000. After 3 months, the project manager realizes that the project is 40% complete at a cost of Rs. 75,000. Compute the Cost Performance Index (CPI) and Schedule Performance Index (SPI) and assess the performance of the project. Suppose an organization mentions in its job advertisement that it has been assessed at level 2 of SEI CMM, what can you infer about the current quality practices at the organization? What does this organization have to do to reach SEI CMM level 3? Suppose as the president of a small company, you have the choice to either go for ISO 9000 or SEI CMM based model, which one would you prefer? Give the reasoning behind your answer.	10+5+5=20

4.

(a)

Consider the activities of a software project shown in the below table. Draw the network diagram, identify the critical path and critical activities, and calculate the expected project duration for this software project using PERT. Find the probability of completing the project in 44 days. You may use the normal table given at the bottom of the question paper.

Activity	Predecessor	Estimated Duration (weeks)		
		Optimistic (a)	Most Likely (m)	Pessimistic (b)
A	-	6	10	14
B	A	1	2	3
C	A	16	20	30
D	B	3	5	7
E	D	2	3	4
F	C	7	10	13
G	D	1	2	3
H	G	1	3	5
I	C, G	2	2	2
J	I	2	3	4
K	H	1	1	1
L	J, K	1	2	3

(b)

Draw a Gantt chart for the above project applying *critical chain principles*.

- i. Identify the places, where the buffers will need to be located.
- ii. Assess the size of the buffers.

12+8=20

Normal Table

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.5000	.5040	.5080	.5120	.5160	.5199	.5239	.5279	.5319	.5359
0.1	.5398	.5438	.5478	.5517	.5557	.5596	.5636	.5675	.5714	.5753
0.2	.5793	.5832	.5871	.5910	.5948	.5987	.6026	.6064	.6103	.6141
0.3	.6179	.6217	.6255	.6293	.6331	.6368	.6406	.6443	.6480	.6517
0.4	.6554	.6591	.6628	.6664	.6700	.6736	.6772	.6808	.6844	.6879
0.5	.6915	.6950	.6985	.7019	.7054	.7088	.7123	.7157	.7190	.7224
0.6	.7257	.7291	.7324	.7357	.7389	.7422	.7454	.7486	.7517	.7549
0.7	.7580	.7611	.7642	.7673	.7704	.7734	.7764	.7794	.7823	.7852
0.8	.7881	.7910	.7939	.7967	.7995	.8023	.8051	.8078	.8106	.8133
0.9	.8159	.8186	.8212	.8238	.8264	.8289	.8315	.8340	.8365	.8389
1.0	.8413	.8438	.8461	.8485	.8508	.8531	.8554	.8577	.8599	.8621
1.1	.8643	.8665	.8686	.8708	.8729	.8749	.8770	.8790	.8810	.8830
1.2	.8849	.8869	.8888	.8907	.8925	.8944	.8962	.8980	.8997	.9015
1.3	.9032	.9049	.9066	.9082	.9099	.9115	.9131	.9147	.9162	.9177
1.4	.9192	.9207	.9222	.9236	.9251	.9265	.9279	.9292	.9306	.9319
1.5	.9332	.9345	.9357	.9370	.9382	.9394	.9406	.9418	.9429	.9441
1.6	.9452	.9463	.9474	.9484	.9495	.9505	.9515	.9525	.9535	.9545
1.7	.9554	.9564	.9573	.9582	.9591	.9599	.9608	.9616	.9625	.9633
1.8	.9641	.9649	.9656	.9664	.9671	.9678	.9686	.9693	.9699	.9706
1.9	.9713	.9719	.9726	.9732	.9738	.9744	.9750	.9756	.9761	.9767
2.0	.9772	.9778	.9783	.9788	.9793	.9798	.9803	.9808	.9812	.9817
2.1	.9821	.9826	.9830	.9834	.9838	.9842	.9846	.9850	.9854	.9857
2.2	.9861	.9864	.9868	.9871	.9875	.9878	.9881	.9884	.9887	.9890
2.3	.9893	.9896	.9898	.9901	.9904	.9906	.9909	.9911	.9913	.9916
2.4	.9918	.9920	.9922	.9925	.9927	.9929	.9931	.9932	.9934	.9936
2.5	.9938	.9940	.9941	.9943	.9945	.9946	.9948	.9949	.9951	.9952
2.6	.9953	.9955	.9956	.9957	.9959	.9960	.9961	.9962	.9963	.9964
2.7	.9965	.9966	.9967	.9968	.9969	.9970	.9971	.9972	.9973	.9974
2.8	.9974	.9975	.9976	.9977	.9977	.9978	.9979	.9979	.9980	.9981
2.9	.9981	.9982	.9982	.9983	.9984	.9984	.9985	.9985	.9986	.9986
3.0	.9987	.9987	.9987	.9988	.9988	.9989	.9989	.9989	.9990	.9990
3.1	.9990	.9991	.9991	.9991	.9992	.9992	.9992	.9992	.9993	.9993
3.2	.9993	.9993	.9994	.9994	.9994	.9994	.9994	.9995	.9995	.9995
3.3	.9995	.9995	.9995	.9996	.9996	.9996	.9996	.9996	.9996	.9997
3.4	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9998



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Subject code: CS 6413
Full Marks: 20

Subject Name: SPPQM

Dept. Code: CS
Duration: 15 mins

Objective Questions (20 marks)

Answer All Questions.

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

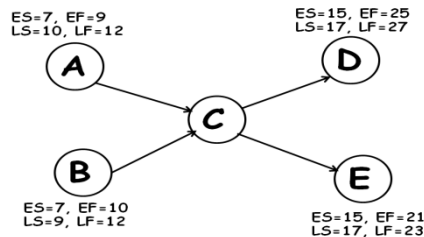
1. Suppose the development time of a large software product has been estimated to be one and half year. Then, in order to develop the product in nine months, what will be total increase in development effort? (Use Putnam's model).
 - a. 2 times
 - b. 4 times
 - c. 8 times
 - d. 16 times
2. Which one of the following is FALSE regarding resource scheduling?
 - a. Resource scheduling may lead to changing the durations of some activities on the PERT chart
 - b. Resource scheduling may not affect the critical path
 - c. Resource scheduling usually shortens the critical path
 - d. Resource scheduling can create additional critical paths
3. Which one of the following is NOT a reason for late project becoming later due to addition of manpower?
 - a. Increased communication among team members
 - b. Learning by the added members
 - c. Increased project scope
 - d. Limited scope for parallelizing various project activities
4. Social interaction is an example of which category of reporting method?
 - a. Oral formal regular
 - b. Oral formal adhoc
 - c. Written formal regular
 - d. Oral informal adhoc
5. Review is applicable to
 - a. SRS document
 - b. Design document
 - c. Code
 - d. All of the above

6. Which one of the followings is NOT a role in the review process?
- a. Moderator
 - b. Recorder
 - c. Reviewer
 - d. Observer
7. Which one of the following technique is most appropriate for assigning earned value to a project consisting of activities with a long duration estimate?
- a. The 50/50 technique
 - b. The 75/25 technique
 - c. The milestone technique
 - d. The percentage complete technique
8. Which one of the following would equal EV/AC?
- a. SPI
 - b. CPI
 - c. SV
 - d. CV
9. Which one of the following most closely characterizes software configuration management?
- a. It is used to ensure that all artefacts associated with the project are correct and complete.
 - b. It is used to break down the work parts into manageable chunks.
 - c. It is used to ensure that all project design criteria are met.
 - d. It is used to ensure that all artefacts associated with the project are consistent and up-to-date.
10. Which one of the following is usually NOT a work product category associated with a software development process?
- a. Uncontrolled
 - b. Pre-controlled
 - c. Controlled
 - d. Post-controlled
11. Which one of the following statements is NOT correct regarding SCCS tool?
- a. It is a popular configuration management tool on UNIX systems
 - b. It can be used for controlling and managing different versions of text files.
 - c. It can handle binary files.
 - d. It provides an efficient way of storing versions that minimize the amount of occupied disk space.
12. Which one of the following project management tools does not support cost management?
- a. Ganttproject
 - b. Microsoft Project
 - c. Primavera SureTrack
 - d. None of the above

13. In CMM, which one of the following maturity levels is called *defined level*?

- a) Level 1
- b) Level 2
- c) Level 3
- d) Level 5

14. Consider a portion of a PERT network diagram given below. What is the ES of activity C?



- a) 9
- b) 10
- c) 11
- d) 12

15. PERT method differs from CPM in which one of the following aspects?

- a) PERT uses statistical time durations whereas CPM uses deterministic time durations.
- b) PERT uses dummy activities whereas CPM does not
- c) PERT uses free float, whereas CPM uses total float in critical path calculations.
- d) PERT uses activity on arc whereas CPM uses activity on node networks.

16. In a PERT chart, if the optimistic, Most likely, and Pessimistic time estimates for a certain task are 12, 15, and 24 hours, what is the expected time for the task completion?

- a) 14 Hours
- b) 15 Hours
- c) 16 Hours
- d) 18 Hours

17. Purchasing insurance cover can be considered to be an example of which one of the following risk handling strategies?

- a) Mitigation.
- b) Transfer.
- c) Acceptance.
- d) Avoidance.

18. A software organization has been assessed at SEI CMM Level 4. Which one of the following does the organization need to achieve, for satisfying one of the KPAs of CMM Level 5?

- a) Defect detection

- b) Defect prevention
- c) Defect isolation
- d) Defect localization

19. In CMMI, which one of the following is the name of the maturity level 5?

- a) Optimal
- b) Optimized
- c) Optimum
- d) Optimising

20. Which one of the following SEI CMM maturity levels should be recommended to a small startup company that focuses on outsourced software development and software maintenance work.

- a) Level 1
- b) Level 2
- c) Level 4
- d) Level 5