Exercise 1: Choose the correct answer(s)

1- Software is computer programs and associated documentation such as requirements, design models and user ....

**a) requirements**

b) access

c) terms of reference

2- COCOMO stands for

**a) Constructive cost model**

b) Constructive cost estimation model

c) Complete cost estimation model

3- A good software must be acceptable to:

a) The developers.

b) The project manager and the administration.

**c) The type of users for which it is designed.**

4- PERT tools are:

a) Prototyping tools.

**b) Planning tools.**

c) Organizing tools.

5- Stand-alone systems that are marketed and sold to any customer who wishes to buy them are called ....

**a) Generic Products.**

b) Customized Products.

6- Software engineers shall be ....... of their colleagues.

**a) fair to and supportive.**

b) fair to and competitors.

7- Which of the following is NOT a software process model?

a) The Waterfall Model.

b) The Incremental development Model.

c) The Reuse-oriented Software engineering Model.

**d) The Product Prototyping.**

8- Human Resource management is formalized in

a) **OBS**

b) WBS

c) PBS

9- A customer may be willing to allow the developer to retain ownership of the code and reuse it in other projects. The prices charged may then be …… then if the software source code is handed over to the customer.

a) Equal

**b) Less**

c) Greater.

10-Pair programming is great for:

a) Trivial Tasks

**b) complex and critical logic**

c) All of the above

11-For large systems engineering projects where a system is developed at several sites.we use:

a) Plan-driven model.

**b) Agile model.**

12-Risk management is one of the most important jobs for a

a) Developer

b) Customer

**c) Project Manager**

13-Estimation of size for a project is dependent on

a) Cost

b) Time

c) Schedule

**d) None of the mentioned**

14- Coping with increasing diversity, demands for reduced delivery times and developing trustworthy software are the .... facing software engineering

**a) Key challenges.**

b) Costs.

c) Technics and methods.

15- Roughly 60% of costs are development costs and 40% are testing costs. For custom software, the........ costs often exceed the development costs.

**a) Evolution**

b) Prototype

c) Engineering

16- Efficiency of a good software includes:

a) Security.

**b) Processing time.**

**c) Responsiveness.**

**d) Memory utilization.**

e) Dependability

17-﻿System maintenance is necessary because

a) Humans never get it right the first time.

b) The deployment platform may change over time.

c) The user's needs may change over time.

**d) All of the above answers.**

18- General issues that affect most software are:

**a) Heterogeneity.**

**b) Business and society.**

**c) Security and Trust.**

d) Customer mood.

19- Applications that execute on a remote computer and are accessed by users from their own PCs or terminals, are called:

a) Stand-alone applications.

**b) Interactive transaction-based applications.**

c) Entertainment systems.

20- The dominant approach for constructing web-based systems is:

**a) Software-reuse.**

b) Performance.

c) Trust.

21- In the ......., you identify the overall structure of the system, the principal components their relationships and how they are distributed.

a) Interface Design.

**b) Architectural design.**

c) Database Design.

d) Component Design.

22- In project Management, to determine if we accomplished the goal or met the target, we are .....

a) Planning

b) Controlling

**c) Measuring**

d) Organizing

23- A better way to reduce the costs of rework in incremental development is:

**a) Use a prototype system.**

**b) Design process so changes can be accommodated at relatively low cost.**

24- The five general phases in the Rational Unified Process model are:

a) Analysis, design, implementation, testing and maintenance.

b) Review, risk-analysis, prototyping, engineering and planning.

**c) Inception, Elaboration, Construction, Transition, In-phase iteration.**

25- ....... focus on the code rather than the design.

**a) Agile Methods.**

b) Plan-driven Methods.

c) None of the above.

26- The objective of software project planning is to:

a) Convince the customer that the project is feasible

b) make use of historical data

**c) enable a manager to make reasonable estimates of cost and schedule**

d) determine the probable profit margin prior to bidding on a project

27- Team members may be unsuited to the intense involvement that characterizes:

**a) Agile Methods.**

b) Plan-driven Methods.

c) Both a) and b).

28- Testing in XP, ....... built are used to run all component tests each time that a new release is

a) Test-first development

b) Incremental test development

**c) Automated test harnesses**

29- The Verification means:

a) Software should match the customer requirements.

**b) Software should match the software specification.**

c) Software should match the customer requirements and the software specification**.**

30- Debugging is concerned with ... and ..... errors in a program.

**a) Locating, repairing**.

b) Verification, validation.

c) Locating, validating.

31- ......... is particularly valuable when a language such as C is used because many errors are undetected by the compiler.

**a) Static Analysis.**

b) Dynamic Analysis.

c) Debugger.

32- In ....... testing the internal structure of the program is hidden from the testing process

**a) Black-box.**

b) White-box.

c) Functional.

d) Both a) and c).

33- .... chart show task dependencies, durations, and the critical path.

**a) Gantt**

b) PERT

c) Bar

34- You should preserve all the test cases for a program. During the maintenance phase, a change is made to the program, the test cases that have been saved are used to do .......

**a) Regression testing**

b) Stress testing

c) Performance testing

35- "No risk management plan" is a risk taken during the project ...... phase.

a) Initiation:

**b) Planning**

c) Execution

d) Close-out/termination

36- "eliminating a specific threat or risk, by eliminating its causes" represents which risk response strategy?

**a) Risk avoidance**

b) Risk acceptance

c) Risk transference

d) Risk mitigation

37- Which one is not a risk management activity?

a) Risk assessment

**b) Risk generation**

c) Risk control

d) None of the mentioned

38-System testing involves executing the system with test ........ that are derived from the specification of the real data to be processed by the system.

**a) cases**

b) modules

c) requirements

39. Which of the following are parameters involved in computing the total cost of a software development project?

**a) Hardware and software costs**

**b) Effort costs**

**c) Travel and training costs**

d) None of the mentioned

40- The project environment is complex. Team members are familiar with the system under development. it is:

a) Organic mode project

b) Semi-detached mode project

**c) Embedded mode project**

41- ........ testing is performed by a select group of friendly customers.

a) Alpha

**b) Beta**

c) Stress

d) Acceptance

42- The ......... debugging approach uses binary partitioning to reduce the number of locations potential where errors can exist.

a) Brute Force

b) Backtracking

**c) Cause elimination**

43- Developing the project plan is an iterative process that involves:

a) Project manager

b) Project team

c) Customer

d) Other stakeholders

**e) All of the above**

44- Incremental development is applicable for:

**a) small or medium-size interactive systems.**

**b) the user interface of large systems.**

c) long-lifetime systems

45- Project managers strive to meet the triple constraint (project scope, time, and cost goals) and also facilitate the entire process to meet the needs and expectations of project stakeholders

**a) True.**

b) False.

46- GANTT tool is:

a) Prototyping tool.

**b) Planning tool.**

**c) Organizing tool.**

47. Embedded control systems are called

a) Generic Products.

**b) Customized Products.**

48. …… is software to support software development and evolution processes.

**a) CASE**

b) PERL

C) GANTT

49- The project is small. Team members are familiar with the system under development. it is:

**a) Organic mode project**

b) Semi-detached mode project

c) Embedded mode project

50- A 3 digit naming scheme for versions is quite common. Version 7.5.5 means

**a) It is release 7, developer version 5 and revision version 5**

b) It is release 5, developer version 5 and revision version 7

c) It is release 5, developer version 7 and revision version 5.

51- A Risk Index is defined by:

a) the probability of a defined threat or opportunity

b) the magnitude of the consequences of the occurrence (impact)

**c) A combination of both (a) and (b)**

52- ........ contracts may include incentives for meeting project such as schedule target

**a) Fixed-price**

b) Cost-reimbursable

c) Time and material

53) The most important ingredient for producing high-quality software efficiently

**a) people﻿**

b) Product complexity

c) none of the above

54- ........ testing is performed within the development organization.

**a) Alpha**

b) Beta

c) Stress

d) Acceptance

Exercise 2: Answer by True or False. Justify your answer in case of False only.

1. The software life cycle begins with a conceptual study.

**False. The software life cycle typically begins with requirements gathering and analysis, not a conceptual study.**

1. The costs of software on a PC are often less than the hardware cost.

**False. Software costs often dominate computer system costs. The costs of software on a PC are often greater than the hardware cost**

1. Testing should not be repeatable.

**False. Testing should be repeatable to discover defects.**

4. The cascade model is a sequential model. **True**

5. Validation and verification are two terms meaning the same thing

**False. Verification means the software should conform to its specification. On the other hand the validation means the software should do what the user really requires.**

6. The four basic process activities for the development processes, in the waterfall model are organized in sequence, whereas in incremental development they are inter-leaved. **True**

7. The prototype is used in the rapid development of software. **True**

8. The unit tests are black-box tests.

**False. Unit tests can be both black-box tests and white-box tests.**

1. Requirement analysis is a step less important than design.

**False. Requirement analysis is a step that is equally important as design in the software development process.**

10. The software engineering methods and tools are the same for all developed software applications.

**False. While all software projects have to be professionally managed and developed, different techniques are appropriate for different types of system. For example, games should always be developed using a series of prototypes whereas safety critical control systems require a complete and analyzable specification to be developed.**

11 The software engineering fundamentals dictate, where appropriate, reuse software that has already been developed rather than write new software. **True**

12. Software engineers are allowed to use their technical skills to misuse other people's computers

**False. Software engineers should not use their technical skills to misuse other people’s computers. They are expected to adhere to ethical standards and legal regulations in their work.**

13. The high-level activities of specification, development, validation and evolution are part of all software processes. **True**

14. The only test that is done during software testing is testing of the system as a whole.

**False: Multiple types of tests are performed at different levels, including unit testing, integration testing, system testing, and acceptance testing.**

15. A prototype can be used in the requirements engineering process, in the design process and in the testing process. **True**

16. Agile methods require higher skill levels in the development team rather than plan-based approaches. **True**

17. User stories are way simpler and more detailed than requirements specification. **True**

18. It is often difficult to estimate size at an early stage in a project when only a specification is available. **True**

19. For small projects with small teams continuous integration is an issue.

**False. For small projects with small teams integration is not an issue. It aims to detect and address integration issues early in the development process**

20. Ideally the burn down chart should merge to zero at the end of the Sprint. **True**

21. The V & V process must be applied at each stage in the software process. **True**

22. The only objective of the V & V process is the discovery of defects in a system.

**False. It Has two principal objectives: The discovery of defects in a system. And the assessment of whether or not the system is useful and useable in an operational situation.**

23. Project Planning is probably the most time consuming project management activity, because it is a continuous activity from initial concept to system delivery. **True**

24. Deliverables are always milestones, but milestones are not necessarily deliverables. **True**

25. Adding people to a late project makes it faster.

**False. Adding people to a late project makes it later because of communication overheads.**

26. Productivity is not proportional to the number of people working on a task **True**

27. The most commonly used product attribute for cost estimation is code size **True**

28. Specification process is defining what the system should do. **True**

29. The COCOMO model takes into account different approaches to software development, reuse cases model, etc.

**False. COCOMO is not suitable for non-sequential, rapid development, reengineering ,reuse cases models because Its accuracy is necessarily limited because of its lack of factors which**

**have a significant influence on software costs**

30. In Project Management, Controlling is critical if we are to use our limited resources wisely. **True**

31. If you can't measure it, you can't manage it. **True**

32. A project manager is proactive and not reactive. **True**

33. For most types of systems, the majority of costs are the costs of changing the software after it has gone into use. **True**

34. Program and Project are the same.

**False: Program and project are not the same. A program is a specific software application or system that performs a set of predefined functions.**

**A project, on the other hand, is a temporary endeavor undertaken to create a unique product, service, or result. A project may involve the development of multiple programs.**

Exercise 3:

A. Consider the following code:

are TheyPositive(int x, int y) {

if (x>= 0) print("x is positive");

else print("x is negative");

if (y>= 0) print("y is positive");

else print("y is negative"); }

For each test set indicates if it is branch coverage, statement coverage or path coverage.

1. test set T1 = ((x=12,y=-5), (x=-1,y=35)} **statement coverage**

2. test set T2= ((x=12,y-5), (x=-1,y=35), (x-115,y=-13),(x=-91,y=-2)} **statement, branch, and path coverage.**

B- List the consequences of not using Project Management

** DELAY**

** COST**

** WASTE OF RESOURCES**

** QUALITY**

** DISSATISFACTION**

** REPUTATION**

C- List the advantages of using Project Management

** Better control of financial, physical, and human resources**

** Improved customer relations**

** Shorter development times**

** Lower costs**

** Higher quality and increased reliability**

** Higher profit margins**

** Improved productivity**

** Better internal coordination**

** Higher worker morale**