

**Part I: Multiple Choice (2 marks each)**

For each question, select ONE and ONLY ONE answer. Choose the most appropriate answer. Put a cross in the box beside your selected answer, like so  .

1. Which of the following is **NOT** a stated goal of the current Internet Architecture?
  - Robustness – problems in individual parts of the network will not cause the whole network to fail.
  - Heterogeneity – able to connect different types of networks and network nodes.
  - Accountability – able to determine who is using what.
  - Hyperlinking – resources are able to link to multiple other resources.
  
2. How does the URI make the web *universal*?
  - We can now use the World-Wide-Web to communicate with other alien beings in the Universe.
  - It is a cross-cultural language universally accepted by all people on the planet.
  - It is protocol based on having web servers and web clients on every router in the world, therefore easing web communication.
  - Everything on the World-Wide-Web can be identifiable using a consistent address format and a unique string.
  
3. Which of the following is a consideration for bodies currently responsible for developing new Internet Architectures for the future?
  - Remove all commercial activities, and return the Architecture to one that is for educational purpose only.
  - Decrease congestion problems by decreasing the number of users on the Internet.
  - Resources on the Internet will become more similar in size and characteristics, and therefore the need to deal with resources of different needs will decrease.
  - Users will be more mobile and move from place to place very often and very quickly.
  
4. What is the purpose of having architecture *frameworks*?
  - So that there is a consistency in how we hire staff for different projects.
  - So that we can have fixed standards for what platform to use for developing Internet software.
  - So that we can transfer knowledge gained from one project to another easily.
  - So that we can determine what the final cost of developing the software architecture.
  
5. What is HTTP?
  - A protocol to transport content between a web browser and a web server.
  - A protocol to transport content between routers.
  - A protocol to transform content from HTML to XML.
  - A protocol to replace the beginning of all URLs with the prefix “www”.

6. In the 4+1 View Model, the Use Case view

- Can be used to replace the other 4 views.
- Is a representation of the other 4 views from the perspective of the software end-user.
- Ties the other 4 views together by using elements from the 4 views to present examples.
- Is the view used at the beginning a project when the components of the architecture is unclear.

7. What is the *Semantic Web*?

- The next generation World-Wide-Web proposed by Semantic Technologies, that replaces all current HTML content with XML.
- The World-Wide-Web where syntax errors such as wrong URLs are trapped by browsers and servers so that they do not waste network bandwidth.
- A network environment when all content are available in multiple languages rather than just English.
- An initiative to create a web where programs can communicate with other programs without manual intervention.program.

8. Which of the following is **NOT** a part of a network architecture?

- The network nodes
- The network connections
- The protocols used by the network software
- The process used to create the network

9. Which of the following is **NOT** a *concern* for a user of Internet software?

- Reliability
- Security
- Efficiency
- Ease of development

10. Why is WSDL an important part of Web Services?

- It defines how Web Services are supposed to link with lower level network protocols like TCP and IP.
- It allows different services to integrate with each other, by negotiating common exchange format between two services.
- It contains a description of a service so a client can determine how to access the service.
- It is the transport protocol used to exchange messages between a service client and a service provider.

11. Which of the following is an Agile methodology?

- J2ME
- IEEE 1471
- 4+1 View Model
- Crystal Methods

12. What is an *iteration* in Agile Methodologies?

- Small cycles involving a few steps that is repeated, each cycle improving on the software from the previous cycle.
- A section of code that is repeated and reused many times in different parts of the software being developed.
- A process used to ensure that quality is maintained in developing software, by repeatedly checking the software against the requirements.
- The meeting held at the beginning of every day, that determines the tasks to be completed on that day.

13. Which of the following is **NOT** a part of eXtreme Programming?

- Pair Programming
- Refactoring
- User Stories
- Scrum

14. Which of the following is **NOT** a feature of Agile methodologies?

- Release the software regularly to allow users to provide feedback.
- Concentrate on providing comfortable office space for meetings, and pizza.
- Avoid troubling the client with details of how the software is developed.
- Is people-oriented rather than system-oriented.

15. In eXtreme Programming, the *project velocity* indicates

- How fast the company car can go.
- How efficient the current version of the required software is.
- How fast the programmers can implement code, based on a standard test.
- How much work is getting done on the project.

16. We do **NOT** use Agile methodologies in the following situation:

- The project requirements are likely to change before the project is finished.
- The client wants to be deeply involved with the development work.
- There is a very large project team needing a lot of documentation to communicate information.

- The people would prefer to communicate face-to-face rather than using more efficient online methods.

17. What are *anti-patterns*?

- Patterns that are rejected through the formal review process, but may still be useful under certain situations.
- Patterns that show what not to do.
- Two patterns that do completely opposite things.
- Patterns without a context.

18. How do *workflows* relate to *phases* in the Rational Unified Process?

- Each workflow contains the standard 4 phases.
- Each phase contains the standard 9 workflows.
- Workflows can be extended over multiple phases, or be repeated within any single phase.
- Phases can be extended over multiple workflows, or be repeated within any single workflow.

19. A set of interrelated *patterns*, all sharing some of the same context, is called a

- Pattern Class
- Pattern Format
- Pattern Design
- Pattern Language

20. Which of the following is **FALSE** regarding Internet and Intranet software?

- Internet software involves unknown users while Intranet users are relatively defined based on who is in an organization.
- Internet software can stay the same for longer periods of time since they are determined by an organization's managers, while Internet software has to keep changing to keep their users.
- Security for Intranet software is a lot more important than Internet software since the Intranet is not protected by a firewall.
- We can get feedback from users of Intranet software a lot easier than we can for Internet software.

21. The Common Language Runtime is

- A class library under Java that supports most runtime facilities.
- An API to transform Java source code to any other language at runtime.
- A virtual machine in the .NET environment that handles managed code.
- A standard data storage solution under .NET.

22. What is the format used by .NET objects to exchange data with each other?

- Text
- HTML
- XHTML
- XML

23. What is the relationship between ADO.NET and Microsoft's older OLE technology?

- ADO.NET does not support OLE communication, and applications must migrate to ADO.NET to work in the .NET environment.
- ADO.NET supports OLE communication by using intermediate layers.
- ADO.NET uses OLE for all communications.
- ADO.NET is exactly the same as OLE.

24. Which of the following is **TRUE** about Microsoft .NET?

- Web Services is a core part of the environment.
- The environment is structured to provide support for application users to extend the software they buy to use available online services.
- The framework contains components that help developers access the source code for Microsoft Office.
- None of the above.

25. Which of the following is **NOT** a Java *container*?

- Applet
- Enterprise Java Beans
- Application
- Bytecode

26. Comparing J2EE and Microsoft .NET, which of the following technologies have the same responsibilities in their respective platforms?

- Java Profiles and .NET Assembly
- EJBs and ASP.NET
- Java Runtime Environment and .NET Common Language Runtime
- Java class libraries and Microsoft Passport

27. The edition of Java that support wireless programming is

- J2EE
- J2JE
- J2ME
- J2SE

28. Which of the following is **NOT** a key part of Sun Microsystem's J2EE solution architectures?
- Made for smaller applications such as mobile devices.
  - Derived using the Unified Process
  - Have standard patterns to use as solutions in different problem environment.
  - Promoted through Sun Certified Enterprise Architect (SCEA) certification.
29. What is a *fat* client?
- A client in a client-server application where most of the processing is done by the client instead of the server.
  - A client in a client-server application where the client is protected by multiple layers of security protocols.
  - A piece of client software that can be refactored to remove many inefficient operations.
  - A client in a client-server application where the server is not necessary for the application to work.
30. Why are there different *profiles* and *configurations* under Java 2 Micro Edition?
- To specify different runtime environments corresponding to different categories of wireless devices.
  - To provide different development environments for devices from each hardware vendor.
  - To specify which parts of the Java Virtual Machine (JVM) different application should hook into to make their applications efficient.
  - To guide the developer to choose which programming language to use when developing their applications.
31. Which of the following does **NOT** describe a purpose of metadata about documents?
- To ease searching for documents.
  - To allow documents to be indexed properly.
  - To allow efficient storing of documents.
  - To hide important information about documents.
32. What is the advantage of using ODBC compared to a proprietary database connectivity API?
- We do not need to make significant changes when porting the applications from using one database system to another.
  - All the components of the .NET environment is available through ODBC.
  - ODBC contains an extensive set of security management tools.
  - ODBC uses fully the special features of the particular database

33. What factors do we **NOT** have to consider when deciding on which database connectivity technology to use in a web application?
- The browsers used by the application users.
  - The platform the web server runs on.
  - Do we need to use multiple database systems.
  - What support is available from the intended database system(s).
34. Which of the following are viable alternatives to not using a database management system in a web application?
- Storing data in static HTML documents.
  - Storing data on client machines so that users can access the data directly.
  - Storing data in routers since all data traffic must be routed.
  - None of the above – all web applications must have a database management system.
35. What are the important responsibilities for a database system in a 3-tier web application?
- How data is graphically presented to the user.
  - How queries are obtained from the user.
  - How to ensure new data does not compromise the integrity of existing data.
  - How data used by the application is generated.
36. Which of the following is possible for a web site administrator to track?
- All the different web sites visited by a user during a particular web browser session, as long as one of those sites is handled by the administration.
  - The different pages visited by a user during a particular web browser session, as long as all the pages are on sites handled by the administration.
  - The different plug-ins used by a user to view resources during a particular web browser session, as long as all the resources are on sites handled by the administration.
  - All cookie information the user sent to all web sites during a particular web browser session.
37. Why is it important to have common log formats such as CLF?
- So that analysis software will work on many different logs.
  - Because web server exchange their logs with their neighbouring servers periodically for maintenance purposes.
  - Because CLF is a binary format and so is harder to hack into than normal text logs.
  - So that web clients and web servers can use the same log format.
38. Why do we need to preprocess web logs before analysing them?
- Because the logs are usually in a language encoding that most software do not understand.

- Because the logs usually contain too much data.
  - Because the logs may contain virus and malicious code.
  - Because the logs usually contain private information that is not suppose to be tracked.
39. Which of the following measurement techniques may not involve using software to automatically gather data?
- Packet monitoring.
  - Proxy logging.
  - User-centric measurement.
  - Active measurement.
40. In a heavy Knowledge-based Economy, which industrial sector would have the biggest percentage of the workforce?
- Service
  - Manufacturing
  - Agriculture
  - None – the workforce would be evenly distributed.
41. What is the difference between “formal access” and “effective access”?
- “Formal access” means physical access to hardware/software/network connections, while “effective access” means having the training and support of properly use the hardware, software, and network connectivity.
  - “Formal access” means you have to apply and pay for Internet access, while “effective access” means you are given the access for free by being a citizen within a country.
  - “Formal access” means having restrictions put on your Internet access, while “effective access” means you are unrestricted in what you use the Internet for.
  - “Formal access” means access within workplaces, while “effective access” means access by the general public in informal places like homes and Internet cafes.
42. What is the *massification* of culture?
- Culture becoming the same as other aspects of society like politics and religion.
  - Culture becoming too big to manage because the Internet allows a lot of people to change it easily.
  - The Internet making cultures very diverse.
  - Cultures becoming relatively similar due to mass media technologies like the Internet.

**Part II: Justifications (10 marks each)**

Please answer all questions in point form. Very briefly explain each point to ensure there is no confusion.

1. Give reasons why Internet-based software should be developed differently than standalone or Intranet software.

2. Give reasons why it is important to have *principles* underlying the development of the Internet Architecture.

3. Give reasons why developers may choose to use .NET to develop Web Services as oppose to other technologies.

4. Give reasons why *patterns* are more suitable to describe solutions than *algorithms*.

5. Give reasons why developing workload models for web characteristics is useful.

**Part III: Diagrams (10 marks each)**

1. Describe the operations of a 3-tier web application using a diagram (or a set of diagrams).

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2. Describe the components of Wireless Java using a diagram (or a set of diagrams).

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