西 安 电 子 科 技 大 学

考试时间 120 分钟

试　　题

题号	一	二	三			总分
分数						

1.考试形式：闭卷； 2.考试日期：2020 年 8 月 日； 3.本试卷共 3 大题，满分 100 分。

班级_____学号_____姓名_____任课教师_____

NOTE: Write all answers on the answer sheet.

Q.1：Multiple Choice. (20points)

1. A system _____ is usually has the higher priority on key decisions in information system development.

A. owner　　B. designer

C. user　　D. analyst

2. _____ systems are front-office information systems which support business functions that extend out to the organization's customers.

A. Inventory control　　B. Human resources

C. Customer management　　D. Manufacturing

3. "A standard system development process ('methodology') purchased or developed", which is belongs to CMM level _____.

A. 1　　B. 2

C. 3　　D. 4

4. A _____ is the activity of documenting, managing, and continually improving the process of systems development.

A. project　　B. project management

C. system development　　D. process management

5. ____ integrates various approaches of systems analysis and design for applications as deemed appropriate to the problem being solved and the system being developed.

A. Information engineering　　B. Structured analysis

C. Agile method　　D. Rapid analysis

6. When performing "observation" fact-finding method, _____ is NOT appropriate?

A. obtain permission from appropriate supervisors or managers

B. make some assumptions

C. keep a low profile

D. don't focus heavily on trivial activities

7. _____ is a graphical tool used to identify, explore, and depict problems and the causes and effects of those problems.

A. Ishikawa (Fishbone) diagram
B. PERT chart
C. Gantt chart
D. Workflow diagram

8. _____ defines the minimum and maximum number of occurrences of one entity that may be related to a single occurrence of the other entity.

A. Subsetting criteria
B. Generalization
C. Cardinality
D. Degree

9. _____ is a process model used to depict the flow of data through a system and the work or processing performed by the system.

A. Flow chart
B. Data flow diagram
C. Activity diagram
D. E-R diagram

10. _____ is a measure of how well the solution will work in the organization. It is also a measure of how people feel about the system/project..

A. Operational feasibility
B. Economic feasibility
C. Schedule feasibility
D. Technical feasibility

11. A(n) _____ relationship is used to model the association between two classes: To indicate that when a change occurs in one class, it may affect the other class. To indicate the association between a persistent class and a transient class.

A. inheritance
B. dependency
C. aggregation
D. composition

12. The _____ approach is an iterative process involving a close working relationship between the designer and the users, to generate a small-scale, incomplete, but working sample of a desired system.

A. information engineering
B. prototype
C. object-oriented design
D. rapid application development

13. Data partitioning truly distributes rows and columns of tables to specific database servers with little or no duplication. _____ assigns different columns to different servers.

A. Vertical partitioning
B. Horizontal partitioning
C. Orthogonal partitioning
D. Top-down partitioning

14. _____ is the process of translating the source data or document into a computer readable format.

A. Data entry
B. Data mining
C. Data process
D. Data capture

15. _____ is an internal output that presents information with little or no filtering.

A. Daily report
B. Summary report
C. Exception report
D. Detailed report

16. In ____ processing, the entered data is collected into files called batches and processed as a complete batch.

A. batch
B. on-line
C. interactive
D. remote batch

17. According to Galitz, _____ does NOT result in confusion, panic, frustration, boredom, misuse, abandonment, and other undesirable consequences.

A. excessive use of computer jargon and acronyms
B. obvious or intuitive design
C. inability to distinguish between alternative actions
D. inconsistent problem-solving approaches

18. _____ objects that hold application or business rule logic.

A. Process
B. Control
C. Entity
D. Interface

19. The _____ relationship would be used to limit the message sending between objects to one direction.

A. association
B. navigability
C. visibility
D. directional

20. _____ models the logic of a use case by depicting the flows of messages between objects in message sequence.

A. Class diagram
B. Activity diagram
C. Sequence diagram
D. Collaboration diagram

Q.2: For each of the tasks listed below, draw a PERT chart and determine the critical path. (20 points)

Activity ID	Activity Description	Duration (Weeks)	Predecessor
A	Preliminary investigation	1	None
B	Problem analysis	2	A
C	Data requirement analysis	3	B
D	Process requirement analysis	5	B
E	Logical database design	6	C
F	Normalized form analysis	4	C
G	Physical database design	3	E, F
H	Dataflow design	6	D, F
I	Interface design	4	G, H
J	System implementation	30	I
K	System testing	10	J
L	Installation	5	K

USE THE FOLLOWING NOTATION WHEN DRAWING THE PERT CHART.

Activity ID	
Early Start	Duration
Late Start	Slack Time

Q.3: Given the narrative description, answer the questions. (60 points)

The Xidian University Libraries is affiliated to Xidian University with 17 lending rooms (借阅室) in the two campuses. The manager has decided to redesign its collection material database named XLD. Currently, the database holds information on:

- ✧ Books, videos and CDs available for borrowing;
- ✧ Every item (book, video, CD) has a unique collection ID, a title, and an ISBN which is unique for every publication; every item may be in good order or damaged; note that if there are 10 copies of a single book, they have distinct collection ID, but identical ISBN;
- ✧ Books can be in Chinese, English, or another language; in either case, the database stores the language the book is written in;
- ✧ Books have a publisher and one or more authors; CDs and videos have a unique producer, and one or more artists.

In addition, the database maintains data on library users and their borrowed material:

- ✧ Each user has a unique userID, address, phone; users can be teachers, postgraduate or undergraduate students; each user can borrow material for 45 days;
- ✧ When a user selects an item to be borrowed, the library clerk updates the database, recording userID, collection, and date of borrowing;
- ✧ When a user returns an item, the library clerk updates the database, recording the date when the item was returned; if the item is overdue, the clerk also collects a fine calculated as DaysLate * fine/day; the fine per day amount is ￥0.10 for every user; the clerk also records the fine collected, if any; in addition, the clerk checks if the returned item is damaged, and if so, records this information;
- ✧ When a new material is purchased, it is catalogued (归类) (i.e., an entry is added to the database) and it is made available in some lending rooms. Damaged and unused material is removed from the collection. This is done once every six months.

(1) Draw the Context Data Flow Diagram and Functional Decomposition Diagram for XLD. (15 points)

(2) Produce an Entity Relationship Diagram (Logical Data Model) and a set of Normalized Tables for the scenario. (20 points)

Sample table: Tblname (primarykey#, foreignkey#, attr1, attr2)

(3) It has been decided that the database will be developed using object oriented analysis and design (OOA/OOD) methodology.

a) Draw a UML Use Case diagram for XLD and write the expanded description of ONE primary use case (表格形式). (15 points)

b) Design an initial Analysis Class Model that shows the process and data required to support XLD. (10 points)