SLIATE

SRI LANKA INSTITUTE OF ADVANCED TECHNOLOGICAL EDUCATION

(Established in the Ministry of Higher Education, vide in Act No. 29 of 1995)

Higher National Diploma in Information Technology
First Year, Second Semester Examination – 2021
HNDIT2032- System Analysis & Design

Instructions for Candidates:
Answer any five (5) Questions
All questions carry equal marks.
Non-programmable calculators are allowed in this examination

No. of questions : 06
No. of pages : 05
Time : 03 hours

Question 1 **[Total 20 Marks]**

i) List two (02) users of a typical Library System (02 Marks)

ii) Define the term System Analyst. (02 Marks)

iii) Briefly describe the responsibilities of the System Analyst to make a system development process effective. (02 Marks)

iv) Describe the two (02) prototyping techniques commonly used in software development. (06 marks)

v) Explain the importance of following a proper **System Development Life Cycle** for successful software development projects. (08 marks)

Question 2 **[Total 20 Marks]**

1. State two (02) requirement elicitation techniques. (02 Marks)
2. Give four (04) major feasibility areas. (04 Marks)
3. Explain three (03) purposes of feasibility study. (06 marks)
4. Company invest for two projects and cash flow is given below.

Year	Project 1	Project 2
0	-50000	-50000
1	20000	35000
2	30000	30000
3	35000	20000

a. Calculate the NPV of two projects. The discount factor is given as 10%. (05 Marks)

b. Select the profitable project considering their NPV values. (03 Marks)

Question 3 **[Total 20 Marks]**

i) State two (02) things which usecase diagram can illustrate. (04 Marks)

ii) Give suitable examples for the following relationships

a. Extend

b. Include

c. Association (06 Marks)

iii) Draw a usecase diagram for the following scenario (10 Marks)

A company wants to develop an e-commerce platform to sell products online and provide a seamless shopping experience to customers. Consider the following aspects.

Users of the system are two types, customer and shop owner. Shop owners should be able to add and modify the product details including product name, descriptions, image, pricing, and availability. The system should allow customers to register and create user accounts, enabling them to log in, manage their profiles, and track their order history. The system should provide a shopping cart feature that allows customers to add products, modify quantities, and proceed to checkout. Further, the system should integrate secure payment gateways to facilitate online payments, supporting various payment methods such as credit cards, digital wallets, or bank transfers.

Question 4 **[Total 20 Marks]**

i) What is the major difference between structured analysis and Object Oriented analysis? (04 marks)

ii) Answer the following questions based on the scenario below.

A university wants to develop a online Student Registration System to automate and streamline the student enrollment process.

The system will allow applicants to register for a course by submitting an application. Faculty members will review the application and send feedback to the applicant. Faculty members will also have access to the system to manage course and course schedules. Registered students can view course and course schedules. Scheduled files store information about the schedules whereas the student information file stores student details and course details store in course file.

a) Identify the external entities of Student Registration System (03 Marks)

b) Draw the Context Diagram (03 Marks)

c) Identify sub process of the system (03 Marks)

d) Identify the data stores of the system. (03 Marks)

e) Draw the Level-0 DFD for the above scenario. (04 Marks)

Question 5 **[Total 20 Marks]**

i) Define the following concept in the context of an entity relationship model.

a. Entity

b. Relationship (04 Marks)

ii) The following scenario explains the hospital management system.

A hospital wants to develop a management system to handle patient records, appointments, and medical staff management.

A patient can have multiple appointments. A doctor checks only one appointment at a time. Also, the system should maintain the medical records of each patient. Patients are usually identified by their patient Id, name, address, and telephone number whereas doctors have their own employee Id, name, title, and telephone number. It is required to search doctors by their first name and last name separately. Appointments consist of appointment number date and time

a. Identify four (04) entities in the above hospital management system. (04 Marks)

b. Identify three (03) relationships in the above system (03 Marks)

c. Identify the cardinality of these three (03) relationships (03 Marks)

d. Identify the primary keys in each entity (03 Marks)

e. Draw an Entity-Relationship diagram that models the information in the above mension hospital Management system. (03 Marks)

Question 6 **[Total 20 Marks]**

i) What is meant by file conversion? (02 Marks)

ii) State two(02) advantages and two(02) disadvantages of **Pilot** conversion strategy. (04 Marks)

iii) The following UML Class Diagram is created for online Electronic equipment shop. Consider the diagram and answer the questions.

a. Identify the type of relationship between classes given below

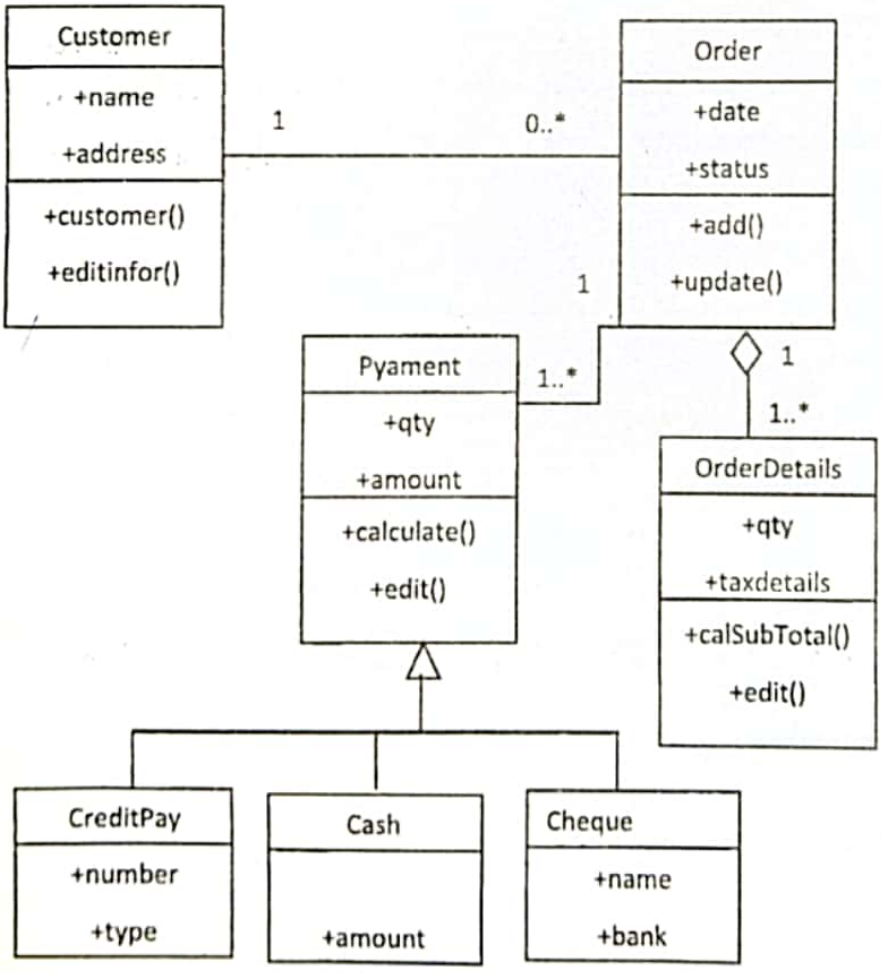
i. Customer-Order

ii. Order-OrderDetails

iii. Payment -CreditPay (06 Marks)

b. Identify one interface class and one control class . (04 Marks)

c. Write a short description about this system. (04 Marks)



PRESENT VALUE TABLE

Present value of \$1, that is $(1+r)^{-n}$ where r = interest rate; n = number of periods until payment or receipt.

Periods (n)	interest rates (r)									
	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909
2	0.980	0.961	0.943	0.925	0.907	0.890	0.873	0.857	0.842	0.826
3	0.971	0.942	0.915	0.889	0.864	0.840	0.816	0.794	0.772	0.751
4	0.961	0.924	0.888	0.855	0.823	0.792	0.763	0.735	0.708	0.683
5	0.951	0.906	0.863	0.822	0.784	0.747	0.713	0.681	0.650	0.621
6	0.942	0.888	0.837	0.790	0.746	0705	0.666	0.630	0.596	0.564
7	0.933	0.871	0.813	0.760	0.711	0.665	0.623	0.583	0.547	0.513
8	0.923	0.853	0.789	0.731	0.677	0.627	0.582	0.540	0.502	0.467
9	0.914	0.837	0.766	0.703	0.645	0.592	0.544	0.500	0.460	0.424
10	0.905	0.820	0.744	0.676	0.614	0.558	0.508	0.463	0.422	0.386
11	0.896	0.804	0.722	0.650	0.585	0.527	0.475	0.429	0.388	0.350
12	0.887	0.788	0.701	0.625	0.557	0.497	0.444	0.397	0.356	0.319
13	0.879	0.773	0.681	0.601	0.530	0.469	0.415	0.368	0.326	0.290
14	0.870	0.758	0.661	0.577	0.505	0.442	0.388	0.340	0.299	0.263
15	0.861	0.743	0.642	0.555	0.481	0.417	0.362	0.315	0.275	0.239
16	0.853	0.728	0.623	0.534	0.458	0.394	0.339	0.292	0.252	0.218
17	0.844	0.714	0.605	0.513	0.436	0.371	0.317	0.270	0.231	0.198
18	0.836	0.700	0.587	0.494	0.416	0.350	0.296	0.250	0.212	0.180
19	0.828	0.686	0.570	0.475	0.396	0.331	0.277	0.232	0.194	0.164
20	0.820	0.673	0.554	0.456	0.377	0.312	0.258	0.215	0.178	0.149