SOMAIYA VIDYAVIHAR UNIVERSITY

07.05.2024 (E)

Semester: January 2024 –April 2024		
Maximum Marks: 100 **Examination: ESE Examination**		**Duration:3 Hrs.**
Programme code: 04 **Programme: BTECH IT**	**Class: TY BTECH**	**Semester: VI(SVU 2020)**
Name of the Constituent College: **K. J. Somaiya College of Engineering**	**Name of the department: IT**	
Course Code: 116U04C601	**Name of the Course: Object Oriented Software Engineering**	
Instructions: 1)Draw neat diagrams 2) All questions are compulsory **3) Assume suitable data wherever necessary**		

Que. No.	Question	Max. Marks
Q1	Solve any **Four**	**20**
i)	What is the significance of work breakdown structure?	5
ii)	What are the reasons for delivering project late?	5
iii)	What is Cohesion and Coupling?	5
iv)	Write five design quality guidelines.	5
v)	Write note on Software Reengineering	5
vi)	Explain test driven development.	5

Que. No.	Question	Max. Marks
Q2 A	Solve the following	**10**
i)	Write advantages and disadvantages for Spiral model.	5
ii)	Explain CMMI model with all levels.	5
	OR	
Q2 A	Explain Agile process model with diagram, advantages and disadvantages.	10
Q 2 B	Solve any **One**	**10**
i)	Explain five process framework software engineering activities with diagram.	10
ii)	Which process model will be suitable for game development application? Explain with diagram in detail with its advantages.	10

Que. No.	Question	Max. Marks
Q3	Solve any **Two**	**20**
i)	What is COCOMO? Explain basic COCOMO with all formulas. Also write merits and demerits for the same.	10
ii)	Define risk. Write two characteristics of risk. Write two different approaches for risk Identification.	10
iii)	What are the functions of SCM repository? Write Toolset used on repository.	10

Que. No.	Question	Max. Marks
Q4	Solve any **Two**	**20**
i)	Draw use case diagram for online food ordering and delivery system.	10
ii)	Explain MVC architecture with diagram, its advantages and disadvantages in detail.	10
iii)	Draw sequence diagram for Withdrawal of money from ATM. What is the difference between activity and sequence diagram?	10

Que. No.	Question	Max. Marks
Q5	(Write notes / Short question type) on any **four**	**20**
i)	Software Engineering is layered technology.	5
ii)	Write note on SCI.	5
iii)	Write user interface design rules.	5
iv)	Write different types of maintenance.	5
v)	Draw deployment diagram for working of video player in the browser.	5
vi)	Write class level testing method.	5

SOMAIYA VIDYAVIHAR UNIVERSITY

09.05.2024 (E)

Maximum Marks: 100	**Semester: January 2024 –April 2024** **Examination: ESE Examination**	**Duration:3 Hrs.**
Programme code: 04 **Programme: IT**	**Class: TY**	**Semester:VI (SVU 2020)**
Name of the Constituent College: **K. J. Somaiya College of Engineering**	**Name of the department:** IT	
Course Code: 16UIT04C602	**Name of the Course: Modeling and Simulation**	
Instructions: 1)Draw neat diagrams 2) All questions are compulsory **3) Assume suitable data wherever necessary**		

Que. No.	Question	Max. Marks
Q1	Solve any **Four**	**20**
i)	What is a random number? In the process of generation of pseudo random numbers what are the errors or departures from randomness?	5
ii)	What is an event? What is an exogenous and endogenous event? Give an example for banking system.	5
iii)	Write any five performance measures in Single server Grocery store system.	5
iv)	Using LCM , implement random number generation to get a period of 8.	5
v)	What is point estimate measure in output analysis?	5
vi)	Draw the pdf and cdf of uniform distribution. Give the expression for PDF, mean and variance	5

Que. No.	Question	Max. Marks
Q2 A	Solve the following	**10**
i)	Draw flow chart and explain the arrival event in discrete event simulation.	5
ii)	Considering a single channel queuing system for a car wash, determine the state variables, events (any two for each). What is the necessary condition for the system to be stable?	5
	OR	
Q2 A	Draw neat flowchart for steps in simulation study. Explain the first two steps.	10
Q 2 B	Solve any **One**	**10**
i)	Given the following sequence of numbers, can the hypothesis that the numbers are independent be rejected on the basis of length of runs up and down at [α = 0.05]. $\chi^2_{0.05,1} = 3.84$	10

0.30	0.48	0.36	0.01	0.54	0.34	0.96	0.06	0.61	0.85
0.48	0.86	0.14	0.86	0.89	0.37	0.49	0.60	0.04	0.83
0.42	0.83	0.37	0.21	0.90	0.89	0.91	0.79	0.57	0.99
0.95	0.27	0.41	0.81	0.96	0.31	0.09	0.06	0.23	0.77
0.73	0.47	0.13	0.55	0.11	0.75	0.36	0.25	0.23	0.72
0.60	0.84	0.70	0.30	0.26	0.38	0.05	0.19	0.73	0.44

ii)	Determine whether there is excessive number of runs above and below the mean for the sequence of numbers. Use [$\alpha = 0.05$, $Z_{0.025} = 1.96$]	10

0.09	0.41	0.23	0.68	0.89	0.72	0.12	0.45	0.08	0.32
0.53	0.13	0.65	0.97	0.14	0.49	0.55	0.46	0.77	0.28
0.81	0.63	0.40	0.57	0.02	0.16	0.33	0.86	0.99	0.22
0.76	0.48	0.61	0.39	0.43	0.78	0.20	0.35	0.17	0.93

Que. No.	Question	Max. Marks
Q3	Solve any **Two**	**20**
i)	Results of six replications of bank model collected at same time period(from 11.00am to 1pm) on six days based on average delay in minutes is as follows: **2.79 , 1.12, 2,24, 3.45, 3.13, 2.38** The validation test consists of comparing the system response, namely the average delay equal to 4.3 minutes, to the model responses. Conduct a statistical test using level of significance $\alpha = 0.05$ and $t_{0.025,5} = 2.571$	10
ii)	The data of average lead time (X1) to deliver in months and annual demand (X2) for a machine obtained for the past ten years are as follows: Determine the correlation between these data and comment on the results.	10
iii)	The weights (in kg.) of students are normally distributed. The sample data for 20 students is collected. Determine the maximum likely hood estimator for this distribution.	10

X1	6.5	4.3	6.9	6.0	6.9	6.9	5.8	7.3	4.5	6.3
X2	103	83	116	97	112	104	106	109	92	96

49.18	44.9	47.87	52.76	54.25	62.34	53.14	45.56	48.18	60.71
53.21	39.86	70.18	51.21	49.54	41.15	56.71	53.35	47.20	46.75

Que. No.	Question	Max. Marks
Q4	Solve any **Two**	**20**
i)	Consider a single server system (ATM). Let the arrival distribution be uniformly distributed between 1 and 10 minutes. The service distribution be distributed as follows: Develop the simulation table using event scheduling approach and analyse the system simulating it for 15 minutes. Compute the server utilization. Assume that the first customer is arriving at the system at 0^{th} time. Random digits for Inter Arrival Time(IAT) and Service Time(ST) are:	10

Service Time (min)	1	2	3	4	5	6
Probability	0.05	0.1	0.20	0.30	0.25	0.1

IAT	501	352	61	888	721	201
ST	11	35	43	1	81	53

ii) A newspaper seller buys the paper for 35 cents each and sells them for 50 cents each. Newspapers that are not sold at the end of the day are sold as scrap for 5 cents each. The lost profit from excess demand is 15 cents for each paper demanded that could not be provided. Newspapers are purchased in bundles of 10. There are three types of news days, "Good" ,"Fair" ,"Poor" .with probabilities of 0.35,0.45,0.20 respectively. The distribution of papers on each of the days is shown in table 1. 10

The random digits for types of News day and Demand is shown in table 2.Simulate the demands for five days and record the profit considering the decision to purchase 60 newspapers

Table 1

	Demand Probability Distribution		
Demand	Good	Fair	Poor
40	0.03	0.10	0.44
50	0.05	0.18	0.22
60	0.15	0.40	0.16
70	0.20	0.20	0.12
80	0.35	0.08	0.06
90	0.15	0.04	0.00
100	0.07	0.00	0.00

Table2

RD for type of Newsday	49,32,77,24,94
RD for Demand	86,65,20,60,80

iii) Using the data given in table below, obtain the simulation table emphasizing clock times. 10

Draw figure and table to show the chronological ordering of events :

Customer Number	Interarrival time	Service Time
1	-	2
2	2	1
3	4	3
4	1	2
5	2	1

Determine the (i) time weighted average number of customers in the system.(ii) time weighted average number of customers waiting.

Que. No.	Question	Max. Marks
Q5	Write notes / answers on any **four**	**20**
i)	Multi variate and time series models	5
ii)	A component whose time to failure is exponentially distributed with failure rate 1/6. Generate two random failure times from this distribution. Use R1 =0.38 and R2 = 0.45	5
iii)	Verification in Simulation	5
iv)	Acceptance Rejection method	5
v)	Input modeling	5
vi)	The number of hurricanes hitting the coast of Florida annually has a poisson distribution with a mean of 0.8. What is the probability that more than two hurricanes will hit the florida coast in a year? Give the mean and variance of this distribution.	5

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SOMAIYA

11.05.2024(E)

Semester: January 2024 –April 2024 Maximum Marks: 100 Examination: ESE Examination		Duration:3 Hrs.
Programme code: 04 Programme: B Tech Information Technology	Class: TY	Semester: VI (SVU 2020)
Name of the Constituent College: K. J. Somaiya College of Engineering	Name of the department: Information Technology	
Course Code: 116U04E612	Name of the Course: Vulnerability Analysis and Penetration Testing	
Instructions: 1)Draw neat diagrams 2) All questions are compulsory 3) Assume suitable data wherever necessary		

Que. No.	Question	Max. Marks
Q1	Solve any **Four**	**20**
i)	Discuss phases of pen testing.	5
ii)	Discuss the security, functionality, usability triangle.	5
iii)	Explain examples of application level attacks.	5
iv)	Describe scope and limitations of ethical hacking.	5
v)	Discuss the injection attacks according to OWASP's classification.	5
vi)	Elaborate on Ethical Disclouser.	5

Que. No.	Question	Max. Marks
Q2 A	Solve the following	**10**
i)	Explain the objectives of footprinting.	5
ii)	Discuss the countermeasures of footprinting.	5
	OR	
Q2 A	Apply advanced Google hacking techniques for footprinting. (Minimum five relevant queries with example)	10
Q 2 B	Solve any **One**	**10**
i)	Elaborate on Email footprinting with process and example.	10
ii)	Elaborate on social engineering footprinting with process and example.	10

Que. No.	Question	Max. Marks
Q3	Solve any **Two**	**20**
i)	With respect to ECB, explain generation, vulnerabilities, and mitigations.	10
ii)	Discuss with example the security implications of predictable session tokens generated from concealed sequences, time dependency, and weak random number generation.	10
iii)	Explain types for securing sessions with examples.	10

Que. No.	Question	Max. Marks
Q4	Solve any **Two**	**20**
i)	Give two examples of the following design flaws in authentication i. Vulnerable Transmission of Credentials ii. Brute-Forcible Login iii. "Remember Me" Functionality iv. Incomplete Validation of Credentials v. Predictable Usernames	10
ii)	Discuss password-cracking tools (minimum 2).	10
iii)	With example, explain weaknesses in session token handling	10

Que. No.	Question	Max. Marks
Q5	Discuss in brief (any **four**)	**20**
i)	DOM-based XSS	5
ii)	Stored XSS	5
iii)	Out-of-band SQL Injection	5
iv)	In-band SQL Injection	5
v)	MITM attack techniques	5
vi)	Link manipulation phishing attack	5

SOMAIYA VIDYAVIHAR UNIVERSITY

14.05.2024 (E)

Semester: January 2024 –April 2024		
Maximum Marks: 100 **Examination: ESE Examination**		**Duration:3 Hrs.**
Programme code: 04 **Programme: BTech. In IT**	**Class: TY**	**Semester: VI (SVU 2020)**
Name of the Constituent College: **K. J. Somaiya College of Engineering**	**Name of the department: IT**	
Course Code: 116U04C603	**Name of the Course: Cloud Computing**	
Instructions: 1)Draw neat diagrams 2) All questions are compulsory **3) Assume suitable data wherever necessary**		

Que. No.	Question	Max. Marks
Q1	Solve any **Four**	**20**
i)	Draw Cloud Computing Model (NIST, only diagram).	5
ii)	Explain any one case study where public cloud can't be used. Justify your answer.	5
iii)	Compare type I and type II Hypervisors.	5
iv)	Commodity hardware is suitable for which type of scaling? Justify your answer.	5
v)	Compare Private and Public cloud.	5
vi)	Describe any two methods for data security.	5

Que. No.	Question	Max. Marks
Q2 A	Solve the following	**10**
i)	Explain features of Eucalyptus.	5
ii)	Explain benefits of Eucalyptus.	5
	OR	
Q2 A	Explain architecture of Google App Engine with help of neat diagram	10
Q 2 B	Solve any **One**	**10**
i)	Explain IOT and cloud working model with help of neat diagram.	10
ii)	Explain architecture of Open Stack with help of neat diagram.	10

Que. No.	Question	Max. Marks
Q3	Solve any **Two**	**20**
i)	Explain any five technologies in Evolution of cloud computing.	10
ii)	Explain the responsibilities of cloud provider and users for SaaS/PaaS/IaaS with help of neat diagram.	10
iii)	Explain benefits and challenges of cloud computing	10

Que. No.	Question	Max. Marks
Q4	Solve any **Two**	**20**
i)	Explain Cloud Storage Gateway with help of neat diagram.	10
ii)	Explain Virtual firewall and its mode of operations.	10
iii)	Explain Information Technology Infrastructure Library (ITIL)	10

Que. No.	Question	Max. Marks
Q5	Write notes on any **four**	**20**
i)	OS virtualization with diagram	5
ii)	Shadow Page Table	5
iii)	Network Attached Storage	5
iv)	Nimbus features	5
v)	Need of Cloud for IOT	5
vi)	Security issues in cloud	5

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27.05.2024 (E)

Semester: January 2024 –April 2024		
Maximum Marks: 100	Examination: ESE Examination	Duration:3 Hrs.
Programme code: 04 Programme: B Tech Information Technology	Class: TY	Semester: VI (SVU 2020)
Name of the Constituent College: K. J. Somaiya College of Engineering	Name of the department: Information Technology	
Course Code: 116U04E514	Name of the Course: UI Programming	
Instructions: 1)Draw neat diagrams 2) All questions are compulsory 3) Assume suitable data wherever necessary		

Que. No.	Question	Max. Marks
Q1	Solve any **Four**	**20**
i)	Explain with examples how people respond to poor design.	5
ii)	Give two examples of Poor information readability.	5
iii)	Discuss the News Stream organization pattern with examples.	5
iv)	Desribe in brief Patterns addressing the navigational model.	5
v)	Elaborate on the discoverability challenge associated with In-Page Editing	5
vi)	Explain Multi-Level contextual tools.	5

Que. No.	Question	Max. Marks
Q2 A	Solve the following	**10**
i)	Discuss any two navigation models with examples.	5
ii)	Discuss any two Visually pleasing compositions with examples.	5
	OR	
Q2 A	Design Dashboard for E-Commerce Usage Analytics.	10
Q 2 B	Solve any **One**	**10**
i)	Compare and Contrast overlays and Inlays in web UI.	10
ii)	Discuss in detail transition patterns in web UI.	10

Que. No.	Question	Max. Marks
Q3	Solve any **Two**	**20**
i)	Design Form considering the following points: Use radio buttons, checkboxes, and date pickers Use label form inputs and provide placeholder text to guide users Validate user input and display errors	10
ii)	Design and elaborate Editorial mix patterns for social content production.	10
iii)	Design and elaborate Data Spotlight Pattern for Information Graphic.	10

Que. No.	Question	Max. Marks
Q4	Solve any **Two**	**20**
i)	Illustrate with example notifications and Title patterns for page composition in mobile UI.	10
ii)	Explain with examples any two patterns for the Display of information in mobile UI.	10
iii)	Explain with examples patterns for Drilldown to design in mobile UI.	10

Que. No.	Question	Max. Marks
Q5	Discuss in brief example (any **four**)	**20**
i)	Screen Distraction factors	5
ii)	Picture Manager organization pattern	5
iii)	Hub and Spoke navigation model	5
iv)	Dynamic invitation in web UI	5
v)	Datatip Pattern for Information Graphic	5
vi)	Reversable menu Page Composition Pattern	5