



Semester: January 2023 –May 2023		
Maximum Marks: 100	Examination: ESE Examination	Duration:3 Hrs.
Programme code: 04 Programme: BTECH IT	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: 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)	Explain Reengineering with example.	5
ii)	Explain software configuration item	5
iii)	Explain thick/fat client model.	5
iv)	Consider software project with 77% of risk probability in which 15 components were developed from scratch. Each component have on an average 500 LOC and each LOC have an average cost of \$10. Calculate the risk exposure.	5
v)	Explain external interface requirement for Ecommerce site.	5
vi)	Draw diagram of agile software development with scrum	5

Que. No.	Question	Max. Marks
Q2 A	Solve the following	10
i)	Define five process framework activities for software engineering	5
ii)	Explain 5 CMMI maturity levels	5
	OR	
Q2 A	Explain Spiral model with its advantages and disadvantages with diagram.	10
Q 2 B	Solve any One	10
i)	Explain proactive risk strategy and reactive risk strategy.	10
ii)	Explain RMMM plan for high staff turnover in software industry.	10

Que. No.	Question	Max. Marks
Q3	Solve any Two	20
i)	Explain Inception, Elicitation, Elaboration and Negotiation with respect to requirement engineering task.	10
ii)	Explain functional and non-functional requirement for online food delivery system.	10
iii)	What are the characteristics of good requirement? Why is getting good requirements hard?	10

Que. No.	Question	Max. Marks
Q4	Solve any Two	20
i)	Draw an activity diagram which describes the business process for meeting a new client with swimlane and without swimlane. Include all notations in diagram.	10
ii)	Draw component and deployment diagram for ATM (withdrawal of money) transaction.	10
iii)	Explain MVC architecture, advantages, disadvantages and its application.	10

Que. No.	Question	Max. Marks
Q5	Solve any four	20
i)	Write advantages and disadvantages of waterfall model	5
ii)	Draw risk information sheet with example.	5
iii)	Write a note on Cohesion	5
iv)	Write Software Maintenance types.	5
v)	Write limitations of FP based estimation	5
vi)	Explain umbrella activities of software project	5



Semester: January 2023 –May 2023		
Maximum Marks: 100	Examination: ESE Examination	Duration:3 Hrs.
Programme code: 04	Class: TY	Semester: VI (SVU 2020)
Programme: B.Tech (IT)		
Name of the Constituent College: K. J. Somaiya College of Engineering		Name of the department: IT
Course Code: 116U04C602	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 random variate? Explain the algorithm for random variate generation using Inverse Transform method.	5
ii)	List the steps in Naylor Finger approach of Validation and explain one in detail.	5
iii)	Draw flow chart and explain departure event in discrete event simulation	5
iv)	The probability of computer chip failure is 0.05. Everyday a random sample of size 14 is taken. What is the probability that at most 2 will fail. What is the mean and variance of the above distribution?	5
v)	Local buses arrive at bus stand at every 15 minutes beginning at 5.00am. A passenger arrives at the bus stand randomly which is uniformly distributed between 10.00am and 10.30am. Find the probability that the passenger has to wait for the bus for more than 10 mins. Give the formula for the mean and variance of the distribution.	5
vi)	List the criteria for selecting a good random number generator?	5

Que. No.	Question	Max. Marks
Q2 A	Solve the following	10
i)	Define current content and total count in simulation? Explain these two statistics as indicators of model reasonableness for a model of complex network of queues.	5
ii)	Draw neat diagram and interpret the three steps in model building	5
OR		
Q2 A	With neat diagram and explain iterative process of calibrating a model	10
Q 2 B	Solve any One	10
i)	Test the following random numbers for independence by runs up and down test. [$\alpha = 0.05$, $Z_{0.025} = 1.96$] 0.18 0.01 0.14 0.86 0.89 0.37 0.23 0.60 0.04 0.83 0.42 0.13 0.37 0.21 0.90 0.89 0.91 0.09 0.57 0.99 0.85 0.27 0.41 0.71 0.96 0.31 0.09 0.06 0.23 0.77 0.63 0.47 0.13 0.55 0.11 0.75 0.46 0.15 0.23 0.72 0.70 0.84 0.70 0.30 0.26 0.38 0.05 0.19 0.63 0.44	10
ii)	Define Random Number. Consider a Linear Congruential random number generator with parameters $a=13$, $m=64$ and $c=0$. Select the seed $X_0=2$, and generate random numbers. What is the period of this generator?	10

Que. No.	Question	Max. Marks																
Q3	Solve any Two	20																
i)	<p>A simulation model of a job shop was developed to investigate different scheduling rules. System data revealed that the average time spent by a job in the shop was approximately 4 working days. The model made the following predictions on seven independent replications, for average time spent in the shop: 3.70 4.21 4.35 4.13 3.83 4.32 4.05</p> <p>Is the model output consistent with system behaviour? Conduct a statistical test using level of significance $\alpha = 0.01$ and $t_{6,0.005} = 3.71$</p>	10																
ii)	<p>The numbers of patrons staying at a five star hotel on 20 successive days were observed to be 20, 14, 21, 19, 14, 18, 21, 25, 27, 26, 22, 18, 13, 18, 18, 18, 25, 23, 20, 21. Fit AR (1) model to this data.</p>	10																
iii)	<p>In a company, records of monthly number of manufacturing defects were studied. The records for the past 100 months are as follows:</p> <table><tr><td>Defects per month</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td>Frequency of Occurrence</td><td>35</td><td>40</td><td>13</td><td>06</td><td>04</td><td>01</td><td>01</td></tr></table> <p>Apply Chi -Square test to these data to test the hypothesis that the underlying distribution is Poisson. Use level of significance $\alpha = 0.05$ Use table A.6 given</p>	Defects per month	0	1	2	3	4	5	6	Frequency of Occurrence	35	40	13	06	04	01	01	10
Defects per month	0	1	2	3	4	5	6											
Frequency of Occurrence	35	40	13	06	04	01	01											

Que. No.	Question	Max. Marks												
Q4	Solve any Two	20												
i)	<p>Perform the simulation of the inventory system. Daily demand is represented by the random digits 30, 11, 47, 52, 78, 7 and the demand probability is given by:</p> <table><tr><td>Demand</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr><tr><td>Probability</td><td>0.05</td><td>0.10</td><td>0.20</td><td>0.40</td><td>0.25</td></tr></table> <p>Consider initial inventory is 10 units and review period is 3. Assume that orders are placed at the close of business and are received for inventory at the beginning of business as determined by lead time. The random digits for lead time are 5, 6, 9 and lead time probability is 0.5, 0.3 and 0.2</p> <p>Determine:</p> <ol style="list-style-type: none">1) The ending inventory at the end of sixth day2) The total shortage of inventory in six days	Demand	1	2	3	4	5	Probability	0.05	0.10	0.20	0.40	0.25	10
Demand	1	2	3	4	5									
Probability	0.05	0.10	0.20	0.40	0.25									
ii)	<p>Consider the grocery store with one checkout counter. Write the system states and event notices of the event-scheduling simulation model. Estimate mean response time, observed proportion of customer who spend 4 or more minutes in the system, total number of departures by event-scheduling simulation. Stop the simulation when clock time is at 10. The interarrival time and service time are given below:</p> <table><tr><td>Inter arrival time</td><td>8 6 1 8 3 8</td></tr><tr><td>Service time</td><td>4 1 4 3 2 4</td></tr></table>	Inter arrival time	8 6 1 8 3 8	Service time	4 1 4 3 2 4	10								
Inter arrival time	8 6 1 8 3 8													
Service time	4 1 4 3 2 4													

iii)	(i) Using the data given in table below, obtain the simulation table emphasizing clock times. Also draw figure to show the chronological ordering of events (showing arrival and departure of customers over a period of time)	10																		
<table border="1"> <thead> <tr> <th>Customer Number</th><th>Inter arrival time</th><th>Service Time</th></tr> </thead> <tbody> <tr> <td>1</td><td>-</td><td>2</td></tr> <tr> <td>2</td><td>2</td><td>1</td></tr> <tr> <td>3</td><td>4</td><td>3</td></tr> <tr> <td>4</td><td>1</td><td>2</td></tr> <tr> <td>5</td><td>2</td><td>1</td></tr> </tbody> </table>			Customer Number	Inter arrival time	Service Time	1	-	2	2	2	1	3	4	3	4	1	2	5	2	1
Customer Number	Inter arrival time	Service Time																		
1	-	2																		
2	2	1																		
3	4	3																		
4	1	2																		
5	2	1																		

Que. No.	Question	Max. Marks														
Q5	Solve any four	20														
i)	Explain in brief Monte Carlo Simulation	5														
ii)	What is Type 1 error and Type 2 error in context of model validation? What is power of test?	5														
iii)	Write the steps for K S test for Uniformity of random numbers	5														
iv)	A component having exponential time to failure distribution is recorded. Following are the data points: <table><tr><td>7.319</td><td>4.561</td><td>5.287</td><td>6.142</td><td>0.971</td><td>20.182</td><td>18.152</td></tr><tr><td>3.723</td><td>14.584</td><td>30.764</td><td>10.496</td><td>11.236</td><td>45.855</td><td>23.865</td></tr></table> Determine the maximum –likelihood estimator.	7.319	4.561	5.287	6.142	0.971	20.182	18.152	3.723	14.584	30.764	10.496	11.236	45.855	23.865	5
7.319	4.561	5.287	6.142	0.971	20.182	18.152										
3.723	14.584	30.764	10.496	11.236	45.855	23.865										
v)	Explain the measures of linear dependence Covariance and Correlation between random variables.	5														
vi)	Explain initialization bias in steady state simulation.	5														



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27.05.2023 (E)

Semester: Jan 2023 – May 2023		
Maximum Marks: 100	Examination: ESE Examination	Duration:3 Hrs.
Programme code: 04	Class: TY	Semester: VI (SVU 2020)
Programme: B.Tech IT		
Name of the Constituent College:		Name of the department: IT
K. J. Somaiya College of Engineering		
Course Code: 116U04E611	Name of the Course: Exploratory Data Analytics	
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)	Define data quality. Discuss different issues related to data quality.	5																
ii)	Differentiate between exploratory data analytics and classical data analytics	5																
iii)	How missing data is handled in data mining. List different techniques available for handling missing data.	5																
iv)	In what situation you will prefer mean over the mode. Explain with an application.	5																
v)	What is a difference symmetric and asymmetric binary variables. Explain with an example.	5																
vi)	Explain data discretization using clustering technique with an example.	5																
Q2 A		10																
i)	Solve the following problem using unsupervised partition based technique. (20,30,50,2,4,5,10,12,14,15,19) with $k=3$ and Euclidean distance.	5																
ii)	Explain Minkowski Distance with an example.	5																
	OR																	
Q2 A	$p = 1000000000$ $q = 0000001001$ Calculate the Simple matching coefficient and the Jaccard coefficient. <i>for above values.</i>	10																
Q2 B	Solve any One	10																
i)	Calculate the ANOVA coefficient for the following data: <table><tr><th>Plant</th><th>Number</th><th>Average span</th><th>S</th></tr><tr><td>Mango</td><td>5</td><td>12</td><td>2</td></tr><tr><td>Apple</td><td>5</td><td>16</td><td>1</td></tr><tr><td>Grapes</td><td>5</td><td>20</td><td>4</td></tr></table>	Plant	Number	Average span	S	Mango	5	12	2	Apple	5	16	1	Grapes	5	20	4	10
Plant	Number	Average span	S															
Mango	5	12	2															
Apple	5	16	1															
Grapes	5	20	4															
ii)	Solve the following linear regression algorithm a) Plot the data. Do x and y seem to have a linear relationship? b) Use the method of least squares to find an equation for the prediction of	10																

	a student's final exam grade based on the student's midterm grade in the course.																													
	c) Predict the final exam grade of a student who received an 86 on the midterm exam.																													
	<table><tr><td>x</td><td>y</td></tr><tr><td>Midterm exam</td><td>Final exam</td></tr><tr><td>72</td><td>84</td></tr><tr><td>50</td><td>63</td></tr><tr><td>81</td><td>77</td></tr><tr><td>74</td><td>78</td></tr><tr><td>94</td><td>90</td></tr><tr><td>86</td><td>75</td></tr><tr><td>59</td><td>49</td></tr><tr><td>83</td><td>79</td></tr><tr><td>65</td><td>77</td></tr><tr><td>33</td><td>52</td></tr><tr><td>88</td><td>74</td></tr><tr><td>81</td><td>90</td></tr></table>	x	y	Midterm exam	Final exam	72	84	50	63	81	77	74	78	94	90	86	75	59	49	83	79	65	77	33	52	88	74	81	90	
x	y																													
Midterm exam	Final exam																													
72	84																													
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86	75																													
59	49																													
83	79																													
65	77																													
33	52																													
88	74																													
81	90																													
Q3	Solve any Two	20																												
i)	What is data reduction? Explain any one method available for data reduction.	10																												
ii)	Apply binning techniques on the given data (8 16, 9, 15, 21, 21, 24, 30, 26, 27, 30, 34) a) Binning by smooth data by bin boundaries b) Binning using Smoothing the data by equal frequency bins	10																												
iii)	List and explain different attribute subset selection methods.	10																												
Q4	Solve any Two	20																												
i)	a) Differentiate between Min-max and Z-score normalization. b) Apply Z score normalization on following data (8, 10, 15, 20, 25)	10																												
ii)	a) Consider the strings "PQRSTPQRS" and "PRATPBRQRPS". What is the length of the longest common subsequence? b) Find co-sine similarity for following two documents Document 1 = 'the best data science course' Document 2 = 'data science is popular'	10																												
iii)	a) Outline the major steps of decision tree classification algorithm. b) Write a short note on data filtering techniques.	10																												
Q5	(Write notes / Short question type) on any four	20																												
i)	Differentiate between Scoreboard and Dashboard with example	5																												
ii)	Write a short note on icon based visualization.	5																												
iii)	List different methods for visualizing complex data. Explain any one in detail.	5																												
iv)	Differentiate between chart and graph with an example	5																												
v)	Write a short note on geometric based visualization.	5																												
vi)	Write a short note on hierarchical visualization techniques.	5																												

27.05.2023 (E)

Semester: January 2023 –May 2023		
Maximum Marks: 100	Examination: ESE Examination	Duration:3 Hrs.
Programme code: 04	Class: TY	Semester: VI (SVU 2020)
Programme: BTech IT		
Name of the Constituent College:		Name of the department: IT
K. J. Somaiya College of Engineering		
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)	List OWASP latest top 10 web application security risks. Explain the topmost in brief.	5
ii)	Explain types of attacks with real life examples.	5
iii)	What are the elements of security? Explain its significance w.r.t. VAPT.	5
iv)	What is vulnerability analysis? Discuss any 2 vulnerabilities with example.	5
v)	Explain hacktivism with an example	5
vi)	Explain in brief phases of penetration testing.	5

Que. No.	Question	Max. Marks
Q2 A	Solve the following	10
i)	What is anonymity? How it is related to foot printing.	5
ii)	Identify the type of attack(s) in the following scenario, justify your answer and suggest the preventive measure for identified attack - <i>The Network administrator noticed unusual heavy traffic generated from many of the machines in the company network. All the traffic was targeted ping requests to the Server of the organization.</i>	5
	OR	
Q2 A	What is who-is-look-up? Discuss how it is helpful for VAPT considering some output from who-is-look-up.	10
Q 2 B	Solve any One	10
i)	What do you mean by port scanning? Considering an open port found on a node, explain the attack possible.	10
ii)	Assume that an email address of an organization's CEO is found during the information gathering phase. Explain any two scenarios in which it can be used to perform an attack.	10

Que. No.	Question	Max. Marks
Q3	Solve any Two	20
i)	Consider a password based authentication system, list out the possible vulnerabilities and countermeasures.	10
ii)	Compare i) Design flaw and Implementation flaw ii) Biometric based and Token based authentication	10
iii)	Explain single-sign-on with an example	10

Que. No.	Question	Max. Marks
Q4	Solve any Two	20
i)	List attacks on session management. Explain any two with an example.	10
ii)	Explain any one session token generation technic? State and Justify its security.	10
iii)	What are the challenges with session token handling? Explain the best practises suggested for the same.	10

Que. No.	Question	Max. Marks
Q5	Write short note on any four	20
i)	Website defacement	5
ii)	Same origin policy	5
iii)	Phishing attacks and countermeasures	5
iv)	Compare ARP spoofing and IP spoofing	5
v)	XSS exploitation	5
vi)	SQL injection	5



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27.05.2023 (E)

Semester: January 2023 –May 2023		
Maximum Marks: 100	Examination: ESE Examination	Duration:3 Hrs.
Programme code: 04	Class: TY	Semester:VI(SVU 2020)
Programme: BTech		
Name of the Constituent College: K. J. Somaiya College of Engineering		Name of the department: IT
Course Code: 116U04E615	Name of the Course: Internet of Things	
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 M2M Technology Fundamentals.	5
ii)	Discuss IoT reference model.	5
iii)	Explain the role of Cloud Computing in IoT.	5
iv)	Explain any one IoT application in Agriculture.	5
v)	Explain role of Embedded systems in IoT environment.	5
vi)	Draw neat labelled diagram of Publish –Subscribe communication model, Comment on working of the same	5

Que. No.	Question	Max. Marks
Q2 A	Solve the following	10
i)	List the Real world design constraints for an IoT Application.	5
ii)	List the steps in IoT Design Methodology.	5
	OR	
Q2 A	Explain in detail the role of Cloud computing in IoT application with the help of an example.	10
Q 2 B	Solve any One	10
i)	Explain sensors and actuators in IoT and what is the role played by them in an IoT application.	10
ii)	Write a note on M2M towards IoT-the global context.	10

Que. No.	Question	Max. Marks
Q3	Solve any Two	20
i)	Draw a diagram showing the IoT functional Blocks and explain function of each block in brief with the help of a real world example.	10
ii)	Design a Level-2 IoT system for supply chain management .	10
iii)	Design a Dynamic, self-adapting and self-configuring IoT system for weather forecasting with the help of neat diagram, Write justification of your design for fulfilling the requirements of above mentioned IoT characteristics.	10

Page 1/2

Que. No.	Question	Max. Marks
Q4	Solve any Two	20
i)	State and explain in brief any one IoT Protocol for a) Link layer b) Network layer	10
ii)	State and explain in brief any one IoT Protocol for a) Transport layer b) Application layer	10
iii)	Explain Wireless Sensor Network's architecture	10

Que. No.	Question	Max. Marks
Q5	(Write notes / Short question type) on any four	20
i)	Interoperability	5
ii)	Standardization	5
iii)	IoT used in Smart Grids	5
iv)	IoT used in Industry Automation	5
v)	IoT used in Retail Industry	5
vi)	M2M and IoT value chain	5



Semester: January 2023 –May 2023		
Maximum Marks: 100	Examination: ESE Examination	Duration:3 Hrs.
Programme code: 04	Class: TY	Semester: VI (SVU 2020)
Programme: B.Tech in IT		
Name of the Constituent College:		Name of the department:
K. J. Somaiya College of Engineering		Information Technology
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)	Define virtualization. List its types.	5
ii)	Differentiate between Grid and Cloud computing.	5
iii)	Differentiate between emulation and virtualization.	5
iv)	Describe benefits and functions of IoT cloud.	5
v)	Write role of Identity management and access control in Azure/AWS/GCP.	5
vi)	List possible security threat on cloud Infrastructure.	5

Que. No.	Question	Max. Marks
Q2 A	Solve the following	10
i)	Explain Infrastructure as a service.	5
ii)	Explain Platform as a service.	5
	OR	
Q2 A	Draw and explain Nimbus architecture.	10
Q 2 B	Solve any One	10
i)	Draw and explain Openstack Architecture.	10
ii)	Explain modes of operation of Eucalyptus.	10

Que. No.	Question	Max. Marks
Q3	Solve any Two	20
i)	Explain cloud security management frameworks.	10
ii)	Explain vertical and horizontal scaling in cloud computing with the help of example.	10
iii)	Write short note on Software as a service with help of 4 examples and justify each example.	10

Que. No.	Question	Max. Marks
Q4	Solve any Two	20
i)	Explain different type of virtualization levels.	10
ii)	Write short note on host and data security in IaaS.	10
iii)	Explain Deployment models in cloud computing.	10

Que. No.	Question	Max. Marks
Q5	Write short notes on any four	20
i)	Compare AWS, GCP, Openstack	5
ii)	Write short note on Hypervisor.	5
iii)	Explain benefit and challenge of cloud computing.	5
iv)	Discuss security measures in cloud environment.	5
v)	Draw and explain architecture of Google App Engine.	5
vi)	Explain Traditional system Vs Cloud computing.	5



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01.06.2023(E)

Maximum Marks: 100		Semester: January 2023 –May 2023		Duration:3 Hrs.
Examination: ESE Examination		Class: TY		Semester: VI (SVU 2020)
Programme code: 46		Programme: BTech IT		
Name of the Constituent College: K. J. Somaiya College of Engineering		Name of the department: IT		
Course Code: 116m46C601		Name of the Course: Web and Mobile Application Development-Minor		
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 the two tier web system architecture.	5
ii)	What is Domain name system? Explain with example.	5
iii)	Give any 5 website Design issues.	5
iv)	How SEO is useful in Web page Development.	5
v)	Explain the image tag with example.	5
vi)	How can you improve design of web pages?	5

Que. No.	Question	Max. Marks
Q2 A	Solve the following	10
i)	What is HTML canvas used for? Give its syntax.	5
ii)	Explain hyperlink in HTML with its syntax.	5
	OR	
Q2 A	Design a web page which will show use of Table, order and unordered list in it. (Show the output design along with code).	10
Q 2 B	Solve any One	10
i)	Design a student registration form for Online admission system. (Show the output design along with code, consider maximum number of tags).	10
ii)	Design a Homepage for Airline reservation systems with required HTML elements. (Show the output design along with code, consider maximum number of tags).	10

Que. No.	Question	Max. Marks
Q3	Solve any Two	20
i)	What is CSS? Explain its three types with syntax.	10
ii)	What is use of JavaScript? Explain any of its 4 data types with syntax.	10
iii)	Explain the JavaScript on click and on load events with syntax.	10

Que. No.	Question	Max. Marks
Q4	Solve any Two	20
i)	What are JSON files? Where do we use them? Give example of any sample JSON file.	10
ii)	Explain any five PHP datatypes with example.	10
iii)	How arrays concept can be used in PHP? Show same with example.	10

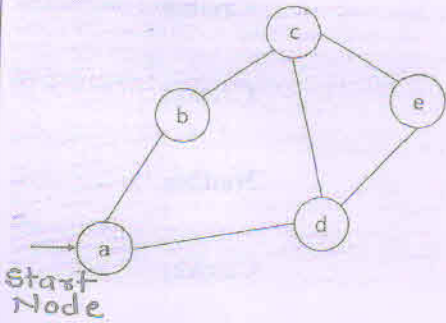
Que. No.	Question	Max. Marks
Q5	Write notes on any four	20
i)	Intent and its types in Android.	5
ii)	ReactJS.	5
iii)	Android layout types.	5
iv)	SQLite database.	5
v)	Event Listeners in Android.	5
vi)	Activity file and manifest file in android.	5

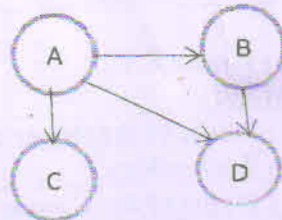


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01.06.2023(E)

Maximum Marks: 100		Semester: Jan 2023 - May 2023	
Examination: ESE Examination		Duration: 3 Hrs.	
Programme code: 04	52	Class: T.Y.	Semester: VI (SVU 2020)
Programme: B. Tech IT-Minor in Robotics and AI			
Name of the Constituent College: K. J. Somaiya College of Engineering		Name of the department: Information Technology	
Course Code: 116M52C601		Name of the Course: AI For Robotics	
Instructions: 1) Draw neat diagrams 2) All questions are compulsory 3) Assume suitable data wherever necessary			

Question No.	Question	Max. Marks
Q1	Solve any Four	20
i)	What are the different kinds of agent available in AI?	5
ii)	What is the well posed learning problem?	5
iii)	What are the differences between adversarial search techniques and blind search techniques?	5
iv)	How Hill Climbing Approach leads to optimization of successive path?	5
v)	How Alpha Beta pruning method is more powerful than Min Max search?	5
vi)	What are different ethics of building intelligent Robot?	5
Q2 A	Solve the following	10
i)	Traverse the following graph by using the Breadth-First Search Algorithm and Depth First Search Algorithm. 	5
ii)	Convert the statement below to the First order Logic: "There is a country that borders both India and China"	5
OR		
Q2 A	What is a Knowledge Based Agent? Explain Wumpus world problem? How you can explore it?	10

Q 2 B	Solve any One	10																																												
i)	<p>What is Bayesian belief network? Consider the following Bayesian belief network:</p> <div></div> <p>The probabilities are given as :</p> <p>$P(A)=0.4$, $P(B)=0.5$,$P(B \sim A)=0.1$ $P(C A)=0.6$ $P(C \sim A)=0.3$ $P(D A,B)=0.7$ $P(D A,\sim B)=0.3$ $P(A \sim A,B)=0.3$ $P(D \sim A,\sim B)=0.2$</p> <p>Compute the probability $P(A B)$ and $P(A,B,C,D)$?</p>	10																																												
ii)	What is uncertainty in AI? What are the causes of uncertainty? How uncertainty can be handled by Artificial Intelligence?	10																																												
Q3	Solve any Two	20																																												
i)	<p>Use KNN technique, find in which class of sports Angelina will lie whose k factor is 3 and age is 5. Here male is denoted with numeric value 0 and female with 1.</p> <table><tr><td>NAME</td><td>AGE</td><td>GENDER</td><td>CLASS OF SPORTS</td></tr><tr><td>Ajay</td><td>32</td><td>0</td><td>Football</td></tr><tr><td>Mark</td><td>40</td><td>0</td><td>Neither</td></tr><tr><td>Sara</td><td>16</td><td>1</td><td>Cricket</td></tr><tr><td>Zaira</td><td>34</td><td>1</td><td>Cricket</td></tr><tr><td>Sachin</td><td>55</td><td>0</td><td>Neither</td></tr><tr><td>Rahul</td><td>40</td><td>0</td><td>Cricket</td></tr><tr><td>Pooja</td><td>20</td><td>1</td><td>Neither</td></tr><tr><td>Smith</td><td>15</td><td>0</td><td>Cricket</td></tr><tr><td>Laxmi</td><td>55</td><td>1</td><td>Football</td></tr><tr><td>Michael</td><td>15</td><td>0</td><td>Football</td></tr></table>	NAME	AGE	GENDER	CLASS OF SPORTS	Ajay	32	0	Football	Mark	40	0	Neither	Sara	16	1	Cricket	Zaira	34	1	Cricket	Sachin	55	0	Neither	Rahul	40	0	Cricket	Pooja	20	1	Neither	Smith	15	0	Cricket	Laxmi	55	1	Football	Michael	15	0	Football	10
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ii)	What is the Reinforcement learning? What is its need and how it overcomes other machine learning issues?	10
iii)	What is the Genetic Algorithms? Explain its working mechanism with suitable example.	10
Q4	Solve any Two	20
i)	What is the conditional Probability? How it applies to the Bayes Filter? Explain it with suitable example.	10
ii)	What is the Gaussian Filters? How Kalman Filter work with suitable example?	10
iii)	What is particle filter? State and Explain particle filtering algorithm.	10
Q5	Write Short answer question on four of the following.	20
	i. Explain how robots can navigate location?	5
	ii. How robot learns from demonstration?	5
	iii. What is backward Chaining Resolution? Explain with suitable example?	5
	iv. Write short note on Autonomy and Automation.	5
	v. Compare inductive learning with analytical learning?	5
	vi. What are the differences between supervised and unsupervised learning?.	5



SOMAIYA
VIDYAVIHAR UNIVERSITY

01.06.2023(E)

Semester: January 2023 –May 2023		
Maximum Marks: 100	Examination: ESE Examination	Duration:3 Hrs.
Programme code: 65	Class: TY	Semester: VI (SVU 2020)
Programme: BTech IT		
Name of the Constituent College: K. J. Somaiya College of Engineering		Name of the department: IT
Course Code: 116h65E601	Name of the Course: Cloud computing security-Honor.	
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 the private cloud in brief.	5
ii)	Explain the community cloud in brief.	5
iii)	What are the benefits of virtualization in context of cloud computing?	5
iv)	List any 5 cloud service providers.	5
v)	Define cloud computing and identify its core feature.	5
vi)	What is Xen? Discuss its elements of virtualization.	5

Que. No.	Question	Max. Marks
Q2 A	Solve the following	10
i)	What are the important pillars of software security assurance?	5
ii)	Explain cloud security services in brief.	5
	OR	
Q2 A	Explain any five relevant cloud security design principles.	10
Q 2 B	Solve any One	10
i)	What are the different secure cloud Development practices?	10
ii)	Elaborate the concept of cloud security principles applicable to cloud security policies and management.	10

Que. No.	Question	Max. Marks
Q3	Solve any Two	20
i)	Explain port scanners and vulnerability scanners techniques of penetration testing.	10
ii)	What are the three phases of penetration testing?	10
iii)	How disaster recovery planning can be done in cloud computing.	10

Que. No.	Question	Max. Marks
Q4	Solve any Two	20
i)	Write a short note on business continuity planning in cloud computing.	10
ii)	Write in detail about privacy and compliance risks for cloud computing in detail.	10
iii)	What are the common threats and vulnerabilities for cloud computing?	10

Que. No.	Question	Max. Marks
Q5	Write notes on any four	20
i)	Cloud access control issues.	5
ii)	Security policies for cloud.	5
iii)	Microarchitectures.	5
iv)	Virtual treats.	5
v)	Hypervisor risks.	5
vi)	Trusted cloud computing.	5



Semester: January 2023 –May 2023		
Maximum Marks: 100	Examination: ESE Examination	Duration:3 Hrs.
Programme code: 66	Class: TY	Semester: VI (SVU 2020)
Programme: Honours in AI		
Name of the Constituent College: K. J. Somaiya College of Engineering		Name of the department: IT
Course Code: 116h66C601	Name of the Course: Deep Learning	
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 are the problems associated with ReLU activation function? How these problems can be avoided?	5														
ii)	What is regularization? How does regularization help to reduce overfitting?	5														
iii)	Why is a convolutional neural network preferred over a dense neural network for an image classification task?	5														
iv)	What are the problems faced during training in Recurrent Networks?	5														
v)	Describe Bagging and Boosting with the help of diagram.	5														
vi)	Match the following: <table border="1"><thead><tr><th>A</th><th>B</th></tr></thead><tbody><tr><td>Image recognition</td><td>MLP/ReLU</td></tr><tr><td>Classification</td><td>Autoencoders</td></tr><tr><td>Object recognition</td><td>Deep Belief Nets (DBN)</td></tr><tr><td>Speech recognition</td><td>Convolutional Neural Networks</td></tr><tr><td>Unsupervised learning</td><td>Recurrent Neural Network</td></tr><tr><td>Text processing</td><td>Restricted Boltzmann Machine (RBM)</td></tr></tbody></table>	A	B	Image recognition	MLP/ReLU	Classification	Autoencoders	Object recognition	Deep Belief Nets (DBN)	Speech recognition	Convolutional Neural Networks	Unsupervised learning	Recurrent Neural Network	Text processing	Restricted Boltzmann Machine (RBM)	5
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Image recognition	MLP/ReLU															
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Object recognition	Deep Belief Nets (DBN)															
Speech recognition	Convolutional Neural Networks															
Unsupervised learning	Recurrent Neural Network															
Text processing	Restricted Boltzmann Machine (RBM)															
Q2 A	Solve the following	10														
i)	What are different challenges motivating Deep Learning?	5														
ii)	What is Stochastic Gradient Descent? What are its advantages and disadvantages?	5														
	OR															
Q2 A	What is the difference between the discriminative and generative models? What is the role of the generator and discriminator in case of GAN?	10														
Q2 B	Solve any One	10														
i)	Describe specific deep network architectures with diagram.	10														
ii)	Explain with diagram activation functions used at hidden layer.	10														
Q3	Solve any Two	20														
i)	What are different challenges related with optimization in deep learning?	10														
ii)	Elaborate with the help of a diagram how RBM can be used in the application of collaborative filtering.	10														
iii)	What is the difference between RNN and LSTM? Describe the working of LSTM in detail with diagram.	10														

Que. No.	Question	Max. Marks										
Q4	Solve any Two	20										
i)	<p>The CNN architecture shown below is composed of CONV layers that perform 5×5 convolution with stride 2 and padding is 'valid'. POOL layers perform 3×3 max pooling with stride 2 (no padding). Number of filters in the CONV layers and number of neurons in fully connected layers are shown in brackets.</p> <table><tr><td>Input Image - RGB [25×25]</td><td>Conv v1 (20)</td><td>Conv 2(40)</td><td>Pool 1</td><td>Conv 3 (120)</td><td>Conv 4 (64)</td><td>Pool 2</td><td>FC1 (1024)</td><td>FC2 (128)</td><td>Output (5)</td></tr></table> <p>For this network, calculate total number of parameters after every layer stepwise. Draw the architecture diagram.</p>	Input Image - RGB [25×25]	Conv v1 (20)	Conv 2(40)	Pool 1	Conv 3 (120)	Conv 4 (64)	Pool 2	FC1 (1024)	FC2 (128)	Output (5)	10
Input Image - RGB [25×25]	Conv v1 (20)	Conv 2(40)	Pool 1	Conv 3 (120)	Conv 4 (64)	Pool 2	FC1 (1024)	FC2 (128)	Output (5)			
ii)	Explain local receptive fields and weight sharing property of CNN with example.	10										
iii)	Explain the terms "Valid Padding" and "Same Padding" in CNN. What are variants of convolution operation in CNN?	10										
Q5	Write short notes on (any four):	20										
i)	Hyperparameter Tuning	5										
ii)	Optimization algorithms with adaptive learning rates	5										
iii)	PII conditioning and saddle points	5										
iv)	Deep Belief Networks (DBNs)	5										
v)	Echo state networks	5										
vi)	Bidirectional RNN	5										