

Roll No.

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**NIST INSTITUTE OF SCIENCE & TECHNOLOGY
(Autonomous)**



B. Tech 7thSemester (2021 Batch)			Branch(s)		CSE/IT	
Subject Code	19EC7OE01T		Subject Name	<i>Principles of Mobile Communication</i>		
Time	90 min		Exam	Mid Semester	Max. Marks	50
Examination Superintendent	Dr. Manabendra Patra					
Name of the Instructor(s)	Purnendu Mishra, Bibhuti B Mishra, Swadhin Mishra					
Date of Examination	31/08/2024		Sitting	2nd		

Answer Question No.1from PART-I which is compulsory, any four from PART-II and any one from PART-III.

The figures in the right hand margin indicate marks.

PART-I

(Answer all the questions)

Q1.		CO	Level	Level-1: Knowledge	Level-2: Comprehension	Level-3: Application	2 X 5
				Level-4: Analysis	Level-5: Synthesis	Level -6: Evaluation	
	(a)	1	2	What is frequency reuse? Why is it used in mobile communication?			
	(b)	1	1	What is cell sectoring? What are the main advantages of it?			
	(c)	1	3	If the cluster size N = 3, then what is the value of reuse ratio?			
	(d)	2	1	What are the three phenomena in radio wave propagation?			
	(e)	1	3	What is the cluster size in a cellular system if i = 1 and j = 2?			

PART-II

(Answer Any Four questions out of six)

Q2.		CO	Level	Level-1: Knowledge	Level-2: Comprehension	Level-3: Application	4 X 6
				Level-4: Analysis	Level-5: Synthesis	Level -6: Evaluation	
	(a)	1	2	Derive the expression for the worst-case scenario S/I for six-sector cells.			

	(b)	1	3	A mobile communication system is allocated RF spectrum of 25 MHz and uses RF channel bandwidth of 25 kHz so that a total number of 1000 voice channels can be supported in the system. i. If the service area is divided into 20 cells with a frequency reuse factor of 4, compute the system capacity. ii. The cell size is reduced to an extent that the service area is now covered with 100 cells. Compute the system capacity while keeping the frequency reuse factor of 4. iii. The cell size is reduced further so that the same service area is now covered with 700 cells with a frequency reuse factor of 7. Compute the system capacity.
	(c)	1	2	What is the need of cell splitting? Explain 4:1 cell splitting.
	(d)	2	1	Explain the free space propagation model.
	(e)	2	3	Find the received power for the link from a synchronous satellite to a terrestrial antenna. Use the following data: height=60,000 km; satellite transmit power = 4 W, <u>transmit antenna gain</u> =0 dB, <u>receive antenna gain</u> = 0 dB and the <u>transmit frequency</u> = 12 GHz.
	(f)	1	1	Define the following terms: cluster, frequency reuse factor, co-channel cells, cell sectoring.

PART-III

(Answer Any One question out of two)

	CO	Level	Level-1: Knowledge Level-4: Analysis	Level-2: Comprehension Level-5: Synthesis	Level-3: Application Level -6: Evaluation	1 X 16
Q3.	1	2	Prove that $N = i^2 + j^2 + ij$ and $q = D/R = V(3N)$			
Q4.	2	3	Represent the ground reflected propagation model and write the expression for the received power at a distance d from the transmitter. Assume a receiver is located 10 km from a 50 W transmitter. The carrier frequency is 900 MHz, free space propagation is assumed. And the gain of the antennas are $G_t = 1$, $G_r = 2$. Find(a) the power at the receiver and (b) path loss.			

$$P_r = P_t \times G_t \times G_r \times \left(\frac{\lambda}{4\pi d}\right)^2$$

$$\lambda = \frac{c}{f}$$

Roll No.	2	0	2	1	1	0	4	2	2	
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B. Tech 7 th Semester (2021 Batch)				Branch(s)	CSE
Subject Code	19CS7PC02T	Subject Name			Compiler Design
Time	90 min	Exam	Mid Semester	Max. Marks	50
Examination Superintendent		Dr. Manabendra Patra			
Name of the Instructor(s)		Ms.Ashalata Panigrahy, Ms.Ruchika Padhi, Mr.Ujalesh Subudhi			
Date of Examination		29/8/2024	Sitting	2nd	

Answer Question No.1 from PART-I which is compulsory, any four from PART-II and any one from PART-III.

The figures in the right hand margin indicate marks.

PART-I

(Answer all the questions)

Q1.		CO	Level	Level-1: Knowledge Level-4: Analysis	Level-2: Comprehension Level-5: Synthesis	Level-3: Application Level -6: Evaluation	2 X 5
	(a)	2	1	Briefly describe different types of LR parsers.			
	(b)	1	2	Differentiate between lexeme and token.			
	(c)	1	1	List the various phases of a compiler.			
	(d)	2	3	Do left factoring in the following grammar: A->aAB aA a B->bB/b			
	(e)	1	2	Define ambiguous grammar.			

PART-II

(Answer Any Four questions out of six)

Q2.		CO	Level	Level-1: Knowledge Application Level-4: Analysis	Level-2: Comprehension Level-5: Synthesis	Level-3: -6: Evaluation	4 X 6
	(a)	1	1	Differentiate between NFA and DFA			
	(b)	1	2	Describe the role of syntax analyzer.			
	(c)	1	3	Draw a DFA for the language accepting strings ending with 'abb' over input alphabets $\Sigma = \{a, b\}$			
	(d)	1	2	Write Rules to construct FIRST Function and FOLLOW Function.			

	(e)	2	2	Explain the error recovery in predictive parsing
	(f)	2	3	Explain the various phases of a compiler in detail. Also write down the output for the following expression: position: initial + rate * 60

PART-III

(Answer Any One question out of two)

		CO	Level	Level-1: Knowledge Application Level-2: Comprehension Analysis Level-3: Evaluation Level-4: Synthesis Level -5: Evaluation Level -6:	1 X 16
Q3.	(a)	2	2	Consider the following grammar: $S \rightarrow Aa bAc Bc bBa$ $A \rightarrow d$ $B \rightarrow d$ Compute closure and goto.	8
	(b)	2	3	Let G be a Context Free Grammar for which the production Rules are given below: $S \rightarrow aB bA$ $A \rightarrow a aS bAA$ $B \rightarrow b bS aBB$ Drive the string aaabbabbba using the above grammar (using Left Most Derivation and Right most)	8
Q4.	(a)	2	3	Consider the following grammar and find the FIRST and FOLLOW of each non-terminal. $E \rightarrow TA$, $A \rightarrow +TA / \epsilon$, $T \rightarrow FB$, $B \rightarrow *FB / \epsilon$, $F \rightarrow \epsilon / id$	8
	(b)	1	3	Define Regular expression. Explain the properties of Regular expressions. Design a FA from given regular expression $10 + (0 + 11)0^*$.	8

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B. Tech 7 th Semester (2021 Batch)				Branch(s)	CSE/IT
Subject Code	19CS7PC01T / 19IT7PC02T	Subject Name		Web Technologies	
Time	90 min	Exam	Mid Semester	Max. Marks	50
Examination Superintendent	Dr. Manabendra Patra				
Name of the Instructor(s)	Dr. Sunil Kumar Nahak, Prof. Ashutosh Parida, Prof. Swetanjali Maharana, Prof. Nibedita Mohapatra, Prof. Saubhagya Ranjan Nath				
Date of Examination	29/08/2024	Sitting	1 ST		

Answer Question No.1 from PART-I which is compulsory, any four from PART-II and any one from PART-III.

The figures in the right hand margin indicate marks.

PART-I

(Answer all the questions)

Q1.	CO	Level	Level-1: Knowledge Level-4: Analysis	Level-2: Comprehension Level-5: Synthesis	Level-3: Application Level -6: Evaluation	2 X 5
(a)	2	1	Define the table tag with an example.			
(b)	3	2	Explain list tag with example.			
(c)	1	2	Differentiate between the internet and WWW.			
(d)	1	2	Define Heading Tags with an example			
(e)	3	3	Write the CSS code for the changing background color of the body of the document.			

PART-II

(Answer Any Four questions out of six)

Q2.		CO	Level	Level-1: Knowledge Level-4: Analysis	Level-2: Comprehension Level-5: Synthesis	Level-3: Application Level -6: Evaluation	4 X 6
	(a)	1	2	Difference between IPV4 and IPV6.			6
	(b)	3	2	Write a short note on HTTPS.			6
	(c)	3	3	Explain about Web2.0 and How it differ from Web 3.0.			6
	(d)	2	3	Define frames with an example.			6
	(e)	2	1	What is CSS and explain different types of style sheets:			6
	(f)	2	2	What is anchor tag? Explain its types with example.			6

PART-III

(Answer Any One question out of two)

		CO	Level	Level-1: Knowledge Level-4: Analysis	Level-2: Comprehension Level-5: Synthesis	Level-3: Application Level -6: Evaluation	1 X 16
Q3.	(a)	3	3	Describe about form tag and it's all elements with examples.			8
	(b)	3	2	What is TCP/IP? What are the advantages over OSI?			8
Q4.	(a)	2	3	Design a table that contains 5 rows and 5 columns. 1 st & 2 nd columns of 2 nd row are merged and last column of 4 th and 5 th row are merged.			8
	(b)	2	2	Define Frameset and Frame Tag. Divide the web page into four equal parts each individual part displays the different web page.			8

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B. Tech 7thSemester (2021 Batch)				Branch(s)	
Subject Code	19CS7PE06T	Subject Name		HUMAN COMPUTER INTERACTION	
Time	90 min	Exam	Mid Semester	Max. Marks	50
Examination Superintendent		Dr. Manabendra Patra			
Name of the Instructor(s)		Prof. Ashish Kumar Dass, Dr. Manjushree Nayak, Prof. Asish Kumar Roy			
Date of Examination		30/08/2024	Sitting	2nd	

**Answer Question No.1 from PART-I which is compulsory, any four from PART-II
and any one from PART-III.**

The figures in the right hand margin indicate marks.

PART-I

(Answer all the questions)

Q1.		CO	Level	Level-1: Knowledge Level-4: Analysis	Level-2: Comprehension Level-5: Synthesis	Level-3: Application Level -6: Evaluation	2 X 5
	(a)	1	2	What do you mean by HCI? Why it is important?			
	(b)	1	1	What are the basic and long term goals of HCI?			
	(c)	2	3	Differentiate direct manipulation and indirect manipulation with respect to screen design?			
	(d)	2	3	Define learning? Explain importance of learning in human characteristics in design?			
	(e)	1	2	Define sophisticated visual presentation.			

PART-II

(Answer Any Four questions out of six)

Q2.		CO	Level	Level-1: Knowledge Level-4: Analysis	Level-2: Comprehension Level-5: Synthesis	Level-3: Application Level -6: Evaluation	4 X 6
	(a)	2	2		What are the benefits of good design? Explain.		
	(b)	2	1		Explain the GUI design in contrast to Webpage design.		
	(c)	1	3		HCI is a multi-disciplinary subject. Illustrate the statement with proper example in different subjects.		
	(d)	1	3		Give a brief history of Human computer interface.		
	(e)	2	2		What do you mean by perception? Explain how this characteristic influences in design.		
	(f)	1	2		What are the causes that human have trouble for a good designing? What are the consequences for that?		

PART-III

(Answer Any One question out of two)

		CO	Level	Level-1: Knowledge Level-4: Analysis	Level-2: Comprehension Level-5: Synthesis	Level-3: Application Level -6: Evaluation	1 X 16
Q3.	(a)	1	3		Explain the role of HCI for the Computer Engineer.		
	(b)	2	2		What are the general principles of design? Explain any five principles in reference to any website.		
Q4.	(a)	2	2		What are the visual pleasing compositions in screen design?		
	(b)	1	3		Explain the psychological responses to poor design from user?		

Subject Code	19CS7PE04T / 19IT7PE01T	Subject Name		Software Project Management	
Time	90 min	Exam	Mid Semester	Max. Marks	50
Examination Superintendent		Dr. Manabendra Patra			
Name of the Instructor(s)		Prof. Santosh Kumar Kar, Prof. Manisha Patro, Dr. Susmita Mahato.			
Date of Examination		30/08/2024	Sitting	1st	

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The figures in the right hand margin indicate marks.

PART-I

(Answer all the questions)

Q1.		CO	Level	Level-1: Knowledge Level-4: Analysis	Level-2: Comprehension Level-5: Synthesis	Level-3: Application Level -6: Evaluation	2 X 5
	(a)	1	1	Explain software project management.			
	(b)	1	1	Explain the activity covered by software project management.			
	(c)	1	2	Explain Stakeholders in detail.			
	(d)	2	2	Explain project portfolio management.			
	(e)	2	2	Explain payback period.			

PART-II

(Answer Any Four questions out of six)

Q2.	CO	Level	Level-1: Knowledge	Level-2: Comprehension	Level-3: Application	4 X 6
			Level-4: Analysis	Level-5: Synthesis	Level -6: Evaluation	
	(a)	1	1	Explain the project control cycle with neat sketch.		6
	(b)	1	2	Differentiate between program management and project management.		6
	(c)	1	2	Identify main difference between managing the development of a conventional project and outsourced project.		6
	(d)	2	2	How ROI can be achieved across a line of business.		6
	(e)	2	2	Explain different types of software effort estimation techniques.		6
	(f)	2	2	Explain the objective of activity planning.		6

PART-III

(Answer Any One question out of two)

		CO	Level	Level-1: Knowledge	Level-2: Comprehension	Level-3: Application	1 X 16
				Level-4: Analysis	Level-5: Synthesis	Level -6: Evaluation	
Q3.	(a)	1	3	Explain the project planning activities in project management. Explain the step-3 and step-4 in detail.			
				What are the major shortcomings of the waterfall model? How the shortcomings can be overcome by the agile model.			
Q4.	(a)	1	3	Explain how the risk involved in a software project can be identified.			
				Explain COCOMO-II and its importance with neat sketch.			

PART-II

(Answer Any Four questions out of six)

Q2.		CO	Level	Level-1: Knowledge	Level-2: Comprehension	Level-3: Application	4 X 6
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PART-III

(Answer Any One question out of two)

		CO	Level	Level-1: Knowledge	Level-2: Comprehension	Level-3: Application	1 X 16
Q3.	(a)			Level-4: Analysis	Level-5: Synthesis	Level -6: Evaluation	
	(a)	1	3	Explain the project planning activities in project management. Explain the step-3 and step-4 in detail.			8
	(b)	2	3	What are the major shortcomings of the waterfall model? How the shortcomings can be overcome by the agile model.			8
Q4.	(a)	1	3	Explain how the risk involved in a software project can be identified.			8
	(b)	2	3	Explain COCOMO-II and its importance with neat sketch.			8