

Roll No. _____

Pandit Deendayal Petroleum University, Gandhinagar

School of Technology

Mid-Semester Examination

B. Tech. (Computer)

Date: 08/03/2018

Course Name : Computer Networks

Semester - IV

Time: 10.30 pm to 12.30 pm

Course Code : 17CP213T

Max. Marks: 50

Instructions to students:

1. Figures to the right indicate full marks.
2. Do not write anything other than your roll number on the question paper.
3. Assume suitable data wherever required and mention it clearly.
4. You are required to answer all the questions in the sequence as given in the question paper. **The out of sequence attempts will not be assessed.**

Q-1 Answer the following questions:

[18]

- a) Assume you wish to transfer an n bytes of file along a path composed of the source, destination, seven point-to-point links, and five switches. Suppose each link has a propagation delay of 2 ms, bandwidth of 4 Mbps, and that the switches support both circuit and packet switching. Thus, you can either break the file up into 1-KB packets, or set up a circuit through the switches and send the file as one contiguous bitstream. Suppose that packets have 24 bytes of packet header information and 1,000 bytes of payload, that store-and-forward packet processing at each switch incurs a 1-ms delay after the packet had been completely received, that packets may be sent continuously without waiting for acknowledgments, and that circuit setup requires a 1-KB message to make one round-trip on the path incurring a 1-ms delay at each switch after the message has been completely received. Assume switches introduce no delay to data traversing a circuit. You may also assume that file size is a multiple of 1,000 bytes. [12]
- a) For what file size - n bytes - is the total number of bytes sent across the network less for circuits than for packets? Show all the calculations.
 - b) For what file size - n bytes - is the total latency incurred before the entire file arrives at the destination less for circuits than for packets? Show all the calculations.
- b) Consider sending a large file of F bits from host A to host B. There are two links (and one switch) between A and B, and the links are uncongested (no queuing delay). Host A segments the file into segments of S bits each and adds 40 bits of header to each segment, forming packet of $40+S$ bits. Each link has transmission rate of R bps. Write an expression for delay incurred in sending the file. Find the value of S that minimize the delay. [6]

Q-2 Answer the following questions:

[16]

- a) Suppose that a certain communications protocol involves a per-packet overhead of 100 bytes for headers and framing. We send 1 million (10^6) bytes of data using this protocol; however, one data byte is corrupted and the entire packet containing it is thus lost. Give the total number of overhead + loss bytes for packet data sizes of 1,000, 5,000, 10,000, and 20,000 bytes. Which size is optimal? [6]
- b) Suppose a 128-Kbps point-to-point link is set up between Earth and a rover on Mars. The distance from Earth to Mars (when they are closest together) is approximately 55 Gm ($55 * 10^9$ meters), and data travels over the link at the speed of light $3 * 10^8$ m/sec. [6]

- i. Calculate the minimum RTT for the link.
 - ii. Calculate the delay * bandwidth product for the link.
 - iii. A camera on the rover takes pictures of its surroundings and sends these to Earth. How quickly after a picture is taken can it reach Mission Control on Earth? Assume that each image is 5 MB in size.
- c) Consider distributing a file of F bits to N peers. Assume a fluid model where a node i can simultaneously transmit to multiple peers at different rates, as long as the combined rate does not exceed its own upload rate. Assume that the upload rate of the server is u_s . The node i has its upload rate of u_i and the download rate of d_i . Derive the expression for minimum distribution time for (1) client - server model, and (2) peer - to - peer model. [4]

Q-3 Answer the following questions: [16]

- a) Suppose that the UDP receiver computes the Internet checksum for the received UDP segment and finds that it matches the value carried in the checksum field. Can the receiver be absolutely certain that no bit errors have occurred? Explain. [4]
- b) Suppose you walk into a room, connect to Ethernet, and want to download a Web page. What are all the protocol steps that take place, starting from powering on your PC to getting the Web page? Assume there is nothing in our DNS or browser caches when you power on your PC. [4]
- c) Why are buffers needed at the output ports of switches? Why are buffers needed at the input port of switches? [4]
- d) Which application layer protocol is used in each of the following activities related to email: [2]
 - i. Send an email from a mail client to a mail server
 - ii. Send an email from a sender's mail server to the receiver's mail server
 - iii. Download an email from mailbox server to a mail client
 - iv. Checking email in a web browser
- e) A graphical HTML browser resident at a network client machine Q accesses a static HTML webpage from a HTTP server S . The static HTML page has exactly one static embedded image which is also at S . Assuming no caching, determine the number of TCP connections and HTTP requests required for loading the HTML web page (including the embedded image) using
 - i. persistent HTTP
 - ii. non-persistent HTTP
 [2]

PANDIT DEENDAYAL PETROLEUM UNIVERSITY, GANDHINAGAR

Attendance Sheet for Mid Sem Examination on 08th March, 2018

B.Tech - IV (Computer)

Subject Code : 17CP 213T

Block No. : D - LH - 3

Subject : Computer Networks

Time : 10.30 AM TO 12.30 PM

Sr. No.	Roll No.	Name of The Student	Answersheet No.	Sign. of Students
1	16BCP001	Aniket Singh Solanki	0208121	Aniket
2	16BCP002	Arya Shailesh Dinkarbhai	0208122	Arya
3	16BCP003	Bavishi Jatna Sanjay	0208123	B. S. Bavishi
4	16BCP004	Bhadiyadara Harsh Jitendrabhai	0208124	Harsh
5	16BCP005	Charli Gandhi	0208125	Charli
6	16BCP006	Chauhan Varun Hemant	0208126	Varun
7	16BCP007	Dave Jeet Rajeshbhai	0208127	Jeet
8	16BCP009	Fenil Dankhara	0208128	Fenil
9	16BCP010	Hansal Shah	0208129	H. Shah
10	16BCP011	Harsh Thakkar	0208130	H. Thakkar
11	16BCP012	Hrithik Mesariya	0208134	Hrithik
12	16BCP013	Ishita Nandwani	0208132	Ishita
13	16BCP014	Jadeja Vishwajeet	0208133	Vishwajeet
14	16BCP016	Jeanie Jessica Basumatary	0208134	Jessica
15	16BCP017	Joel D Macwan	0208135	Joel
16	16BCP018	Kapadiya Kaushal Kiritbhai	0208136	Kaushal
17	16BCP019	Karan Lohia	0208137	Karan Lohia
18	16BCP020	Kartik Bharatbhai Patel	0208138	Kartik
19	16BCP021	Kothari Jinal Dinesh	0208139	Jinal
20	16BCP022	Lad Abhi Navinkumar	0208140	Abhi
21	16BCP024	Mehta Dhaval Ketan	0208141	Dhaval
22	16BCP025	Miral B Katariya	0208142	Miral
23	16BCP026	Parekh Vishalkumar Arvindbhai	0208143	Vishal
24	16BCP027	Parikh Nihit Ronakkumar	0208144	N. R. Parikh
25	16BCP028	Parth Shah	0208145	ABSENT
26	16BCP029	Patel Falguni Laljibhai	0208146	Falguni
27	16BCP032	Patel Nirmalkumar Harshadbhai	0208147	Nirmal
28	16BCP034	Patel Yash Ketan	0208148	Yash
29	16BCP036	Raithatha Dhyey	0208149	Dhyey
30	16BCP037	Rajkumar Anil Vaghashiya	0208150	Anil
31				
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No. of students Present : 29

No. of students absent: 01

Student nos. for UFM if any

Students permitted without University I - Card, upon permission letter, signed by Sr. Supervisor as attached herewith:

Roll No.	Name	Roll No.	Name

Name of Hall supervisor: Niyati Trivedi

Sign: N. Trivedi
8/3/18

AB
Checked by

(29)
Total Answerbooks

[Signature]
Senior Supervisor

PANDIT DEENDAYAL PETROLEUM UNIVERSITY, GANDHINAGAR

Attendance Sheet for Mid Sem Examination on 08th March, 2018

B.Tech - IV (Computer)

Subject Code : 17CP 213T

Block No. : D - LH - 4

Subject : Computer Networks

Time : 10.30 AM TO 12.30 PM

Sr. No.	Roll No.	Name of The Student	Answersheet No.	Sign. of Students
1	16BCP039	Riya Nainish Thakore	0206238	Riya
2	16BCP040	Rughwani Bhavesh Mahendrakumar	0206239	
3	16BCP041	Sahil Rupani	0206240	Sahil
4	16BCP042	Sainik Ankit Ramesh	— Absent	—
5	16BCP044	Sanghavi Smit Vijaykumar	0208084	Sid Sanghavi
6	16BCP045	Savaliya Krina Pravin	0208087	Krina
7	16BCP046	Shah Hitarth Apurva	0208089	Hitarth A. Shah
8	16BCP047	Shah Jigar Jigneshbhai	0206235	Jigar Shah
9	16BCP048	Shikh Mohammed Saad Mohammed Hanif	0206236	Shikh Mohammed
10	16BCP049	Siddharth Narendra Jhatakia	0206237	Siddharth
11	16BCP050	Solanki Bhumika Amrutbhai	0206232	Bhumika
12	16BCP051	Solanki Yash Nileshkumar	0206233	Yash
13	16BCP052	Sonara Shubham Jagdish Chandra	0206234	Shubham
14	16BCP053	Soumya	0208092	Soumya
15	16BCP054	Supragya Lal	0208094	Supragya
16	16BCP055	Thakkar Urja Atulkumar	0208097	Urja
17	16BCP056	Tirth Nareshbhai Patel	0208099	Tirth
18	16BCP057	Toluchuri Shyamili Shanker Rao	0206229	Shyamili
19	16BCP058	Trishla Kothari	0206230	Trishla
20	16BCP059	Ulpa Pankajkumar Makwana	0206231	Ulpa
21	16BCP060	Vaghela Om Ravibhai	0208116	Om
22	16BCP061	Varun Dharmendra Pandya	0208119	Varun
23	16BCP062	Vishruti Kakkad	0208117	Vishruti
24	16BCP063	Vora Vishwa Vimalbhai	0208102	Vishwa
25	16BCP064	Yaagni Raolji	0208104	Yaagni
26	16BCP065	Yogesh Parekh	0208108	Yogesh
27	16BCP066	Bhavsar Vedant Vasant	0208109	Vedant
28	16BCP068	Gupta Shubham Mahendrabhai	0208111	Shubham
29	16BCP069	Jain Dipanshu D.	0208113	Dipanshu
30	16BCP070	Pandya Shubham Prafulkumar	0208115	Shubham
31				
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35				

No. of students Present : 29

No. of students absent: 01

Student nos. for UFM if any _____

Students permitted without University I - Card, upon permission letter, signed by Sr. Supervisor as attached herewith:

Roll No.	Name	Roll No.	Name
/	/	/	/
/	/	/	/

Name of Hall supervisor: Sandip Patil

Sign: [Signature]

[Signature]
Checked by

(29)
Total Answerbooks

[Signature]
Senior Supervisor

B.Tech - IV (Computer)

D - LH - 5

Time : 10.30 AM TO 12.30 PM

Sr. No.	Roll No.	Name of The Student	Answersheet No.	Sign. of Students
1	16BCP071	Rajvee	0208076	R.v. Bhargava
2	16BCP072	Sachdev Sumeet Sabhagchand	0208077	Sumeet
3	16BCP073	Shah Parthiv Bimal	0208078	Parthiv
4	16BCP074	Thakkar Shrey Kartik	0208079	Shrey
5	16BCP075	Varshil P Rajvir	0206082	Varshil
6	16BCP076	Doshi Meet Rupen	0208052	Meet Doshi
7	16BCP077	Kaneria Umang	0208051	Umang
8	16BCP078	Modi Akshay	0208073	Akshay
9	16BCP079D	Chaudhari Nilam Dilip	0208074	Nilam
10	16BCP080D	Chavda Niharika Jagdishbhai	0208075	Niharika
11	16BCP081D	Dhwani Katholia	0208070	Dhwani
12	16BCP082D	Jobanputra Charmiben Kirtikumar	0208071	Charmiben
13	16BCP083D	Kapadiya Dipenkumar Dineshbhai	0208072	Dipen
14	16BCP084D	Kushwaha Kavita Ramgopal	0208054	Kavita
15	16BCP085D	Mansi Samit Desai	0208053	Mansi
16	16BCP086D	Nadpara Hiral Jayeshkumar	0208056	Hiral
17	16BCP087D	Panchal Datvi Suresh	0208055	Datvi
18	16BCP088D	Prabhat Devendra Nathani	0208067	Prabhat
19	16BCP089D	Vidhani Vinita Lalit	0208068	Vidhani
20	16BCP090D	Yash Kirti Patel	0208069	Yash
21	16BCP091D	Zala Hardeepsinh Chandrajitsinh	0208064	Hardeep
22	—	—	—	—

No. of students Present : 21

No. of students absent: 00

Student nos. for UFM if any

Students permitted without University I - Card, upon permission letter, signed by Sr. Supervisor as attached herewith:

Roll No.	Name	Roll No.	Name

Name of Hall supervisor: Dr. J. Swirsky

Sign. John

Checked by

Total Answerbooks

Senior Supervisor

PANDIT DEENDAYAL PETROLEUM UNIVERSITY, GANDHINAGAR

Attendance Sheet for Mid Sem Examination on 08th March, 2018

B.Tech - IV (ICT)

Subject Code : 17CP 213T

Block No. : C - LH - 3

Subject : Computer Networks

Time : 10.30 AM TO 12.30 PM

Sr. No.	Roll No.	Name of The Student	Answersheet No.	Sign. of Students
1	16BIT001	Aarya Kaul Kachru	0207251	
2	16BIT003	Alay Jignesh Shah	0207258	
3	16BIT004	Ayush Khator	0207264	
4	16BIT005	Bavishi Kavan Mehul	0207275	
5	16BIT007	Chavda Bhavesh D	0207276	
6	16BIT009	Dharmik Donga	0207274	
7	16BIT010	Dharmin Dave	0207283	
8	16BIT011	Dhruvil Bhavesh Sheth	0207265	
9	16BIT012	Doshi Jash Tejasbhai	0207263	
10	16BIT013	Foram Kavathiya	0207257	
11	16BIT014	Gajera Pinak Pravinchandra	0207256	
12	16BIT015	Gohel Kashyap Nikunjibhai	0207262	
13	16BIT016	Gohil Sajan	0207266	
14	16BIT018	Jaydutsinh Pradyumansinh Sarvaiya	0207273	
15	16BIT019	Jhanvi Arora	0207278	
16	16BIT020	Jivesh Poddar	0207277	
17	16BIT021	Joshi Hitarth Manoj	0207272	
18	16BIT024	Khasia Astha Ketanbhai	0207268	
19	16BIT025	Kotharia Dirgh Jayprakash	0207261	
20	16BIT027	Margi Manoj Panjvani	0207259	
21	16BIT028	Pal Anubhav Kamal Krishna	0207254	
22	16BIT029	Pandya Utkarsh Samirbhai	0207281	
23	16BIT031	Parikh Vinanti Mayurbhai	0207267	
24	16BIT035	Patel Daksh Harshadbhai	0207271	
25	16BIT036	Patel Dhruvil Jayeshbhai	0207279	
26	16BIT038	Patel Harsh Rakeshbhai	0207280	
27	16BIT039	Patel Masum Bhaveshkumar	0207270	
28	16BIT041	Pranoy G Rathore	0207269	
29	16BIT042	Prayushi Faldu	0207259	
30	16BIT043	Ranipa Hitaishi Ramniklal	0207253	
31				
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No. of students Present : 30

No. of students absent: NIL

Student nos. for UFM if any _____

Students permitted without University I - Card, upon permission letter, signed by Sr. Supervisor as attached herewith:

Roll No.	Name	Roll No.	Name

Name of Hall supervisor: A. H. Sawe

Sign:

Mang Sahni
Checked by

30
Total Answerbooks

ML
Senior Supervisor

PANDIT DEENDAYAL PETROLEUM UNIVERSITY, GANDHINAGAR

Attendance Sheet for Mid Sem Examination on 08th March, 2018

B.Tech - IV (ICT)

Subject Code : 17CP 213T

Block No. : C - LH - 5

Subject : Computer Networks

Time : 10.30 AM TO 12.30 PM

Sr. No.	Roll No.	Name of The Student	Answersheet No.	Sign. of Students
1	16BIT044	Rootvi Pandya	0221541	Ripandya
2	16BIT045	Rughani Pranshu Maheshkumar	0221543	P.m. Pranshu
3	16BIT046	Shah Aakar Mukesh	0221555	Aakar
4	16BIT047	Shah Anushree Nihirkumar	0221551	Anushree
5	16BIT048	Shah Ashil Durgesh	0221562	Ashil
6	16BIT049	Shah Param Bhavin	0221545	Param
7	16BIT050	Shah Saloni Harshit	0221544	Saloni
8	16BIT051	Shalin Parikh	0221568	Shalin
9	16BIT052	Sharma Anuj Bharatkumar	0221542	Anuj
10	16BIT053	Shreya Thakur	0221556	Shreya
11	16BIT054	Shubhang Alkesh Sharma	0221570	Shubhang
12	16BIT055	Solanki Nimesh Dineshbhai	0221557	Nimesh
13	16BIT056	Surili Bharat Hansalia	0221552	Surili
14	16BIT057	Vaniya Hardik Ravajibhai	0221558	Hardik
15	16BIT058	Vekariya Dipeksha	0221554	Dipeksha
16	16BIT059	Vekariya Nevil Arvindbhai	0221563	Nevil
17	16BIT060	Vyas Dishant Rakesh	0221553	Dishant
18	16BIT061	Yadav Akshar Ravindrakumar	0221565	Akshar
19	16BIT062	Yash Jain	0221566	Yash
20	16BIT064	Arya Desai	0221559	Arya
21	16BIT065	Chhaya Harshang Umesh	0221560	Chhaya
22	16BIT066	Doshi Dhruvil Pragnesh	0221567	Doshi
23	16BIT067	Kakkad Pranav	0221569	Kakkad
24	16BIT069	Parth Ashokbhai Parekh	0221546	Parth
25	16BIT070	Patel Aryan Pravinbhai	0221561	Aryan
26	16BIT071	Patel Drishti Rakeshbhai	0221549	Drishti
27	16BIT072	Patel Tirthkumar Mukeshkumar	0221548	Tirthkumar
28	16BIT073	Rajput Abhishek Dhamendra	0221547	Abhishek
29	16BIT074	Vaidik Gautam Patel	0221550	Vaidik
30	16BIT075	Ballani Rahul Raju	0221564	Rahul

No. of students Present : 30

No. of students absent: 00

Student nos. for UFM if any _____

Students permitted without University I - Card, upon permission letter, signed by Sr. Supervisor as attached herewith:

Roll No.	Name	Roll No.	Name

Name of Hall supervisor: Dr. Chaitanya Vyas

Sign: [Signature]

Checked by [Signature]

Total Answerbooks 30

Senior Supervisor [Signature]

PANDIT DEENDAYAL PETROLEUM UNIVERSITY, GANDHINAGAR

Attendance Sheet for Mid Sem Examination on 08th March, 2018

B.Tech - IV (ICT)

Subject Code : 17CP 213T

Block No. : C - LH - 6

Subject : Computer Networks

Time : 10.30 AM TO 12.30 PM

Sr. No.	Roll No.	Name of The Student	Answersheet No.	Sign. of Students
1	16BIT076	Patel Fenil Manishbhai	0209991	F.M. Patel
2	16BIT077	Mahima Soni	0209992	Mahima
3	16BIT078	Aditya Sanjay Dave	0209993	S
4	16BIT079	Patel Harshil Jitendrabhai	0209994	Harshil
5	16BIT080D	Angra Shubham Anilkumar	0209995	Shubham
6	16BIT081D	Pathak Nupurbahen Prakashkumar	0209996	Pathak
7	16BIT082D	Raval Devarshi Harshvardhan	0222150	Raval
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15				

No. of students Present : 07

No. of students absent: 00

Student nos. for UFM if any _____

Students permitted without University I - Card, upon permission letter, signed by Sr. Supervisor as attached herewith:

Roll No.	Name	Roll No.	Name

Name of Hall supervisor: Musht Zantel

Sign: Musht Zantel

[Signature]
Checked by

07
Total Answerbooks

[Signature]
Senior Supervisor