Ref.No. **REFNO039067**

B.Sc. (Hons.) VI Semester Examination 2020-2021

Subject: Computer Science

Paper No.: CS-204-Computer Networks

Time: Four hours] **[Full Marks: 70**

Instructions

1. The Question Paper contains 08 questions out of which you are required to answer any 04 questions. The question paper is of 70 marks with each question carrying 17.5 marks.
   प्रश्नपत्र में आठ प्रश्न पूँछे गये हैं जिनमें से 4 प्रश्नों का उत्तर देना है। प्रश्नपत्र 70 अंकों का है, जिसमें प्रत्येक प्रश्न 17.5 अंक का है।
2. The total duration of the examination will be **4 hours** (Four hours), which includes the time for downloading the question paper from the Portal, writing the answers by hand and uploading the hand-writing answer sheets on the portal.
   परीक्षा का कुल समय 4 घंटे का है जिसमे प्रश्न पत्र को पोर्टल से डाउनलोड करके पुनः हस्तलिखित प्रश्नों का उत्तर पोर्टल पर अपलोड करना है।
3. For the students with benchmark disability as per Persons with Disability Act, the total duration of examination shall be **6 hours** (six hours) to complete the examination process, which includes the time for downloading the question paper from the Portal, writing the answers by hand and uploading the hand-written answer sheets on the portal.
   दिव्यांग छात्रों के लिये परीक्षा का समय 6 घंटे निर्धारित हैं जिसमें प्रश्नपत्र को पोर्टल से डाउनलोड करना एवं हस्तलिखित उत्तर को पोर्टल पर अपलोड करना है।
4. Answers should be hand-written on a plain white A4 size paper using black or blue pen. Each question can be answered in upto 350 words on 3 (Three) plain A4 size paper (only one side is to be used).
   हस्तलिखित प्रश्नों का उत्तर सादे सफेद I4 साइज के पन्ने पर काले अथवा नीले कलम से लिखा होना चाहिये। प्रत्येक प्रश्न का उत्तर 350 शब्दों तक तीन सादे पृष्ठ I4 साइज में होना चाहिए। प्रश्नों के उत्तर के लिए केवल एक तरफ के पृष्ठ का ही उपयोग किया जाना चाहिए।
5. 5. Answers to each question should start from a fresh page. All pages are required to be numbered. You should write your Course Name, Semester, Examination Roll Number, Paper Code, Paper Title, Date and Time of Examination on the First sheet used for answers.
   प्रत्येक प्रश्न का उत्तर नये पृष्ठ से शुरू करना है। सभी पृष्ठों को पृष्ठांकित करना है। छात्र को प्रथम पृष्ठ पर प्रश्नपत्र का विषय, सेमेस्टर, परीक्षा अनुक्रमांक, प्रश्नपत्र कोड, प्रश्नपत्र का शीर्षक, दिनांक एवं समय लिखना है।

Questions:

1.

a. Describe the working principle of Optical fibre cable in brief. (2.5)

b. Why we need three different types of addressing schemes in computer networks? (2.5)

c. What is the difference between random access method and controlled access method? (2.5)

d. Why multiplexing is needed in computer networks? Explain the multiplexing strategy used in Optical fibre cable. (5)

e. Explain the differences between OSI Model and TCP/IP model. What do you mean by data encapsulation and de-capsulation process related with network model? (5)

P.T.O.

2.

a. What is the difference between transmission delay and propagation delay? Give one example. (2.5)

b. What is the basic idea behind QAM (Quadrature Amplitude Modulation)? Give one example. (2.5)

c. Differentiate between single bit error and burst error? Define burst length. (2.5)

d. Compare and contrast Datagram approach and Virtual Circuit approach of packet switching. (6)

e. Differentiate between Manchester encoding and Differential Manchester encoding techniques with suitable example. (4)

3.

a. Define piggybacking and its usefulness. (2.5)

b. What do you mean by access control? Explain CSMA/CD protocol with suitable flow diagram. (5)

c. Explain Hamming Code method for error detection and correction with suitable example? (5)

d. Define sliding window. Using 4-bit sequence numbers, what is the maximum size of the sender and receiver windows for each of the following protocols? (5)

i. Stop-and –wait

ii. Go-Back-N

iii. Selective-Repeat

4.

a. Explain the idea of bridged Ethernet? How it is better from normal Ethernet? (4)

b. Explain IEEE 802.3 Ethernet MAC frame format with suitable diagram? (5)

c. Define channelization and list three protocols in this category. Explain CDMA with suitable example. (6)

d. Differentiate between persistent CSMA and non-persistent CSMA. (2.5)

5.

a. What do you mean by address depletion? How NAT scheme is used to solve this problem? (5)

b. What is the need of IP datagram fragmentation at network layer? Describe the fields related to fragmentation in IP header. (5)

c. Explain the concept of Classless IP Addressing scheme. If you know an IP address of a particular block in classless IP addressing scheme, can you predict any information of that block? If yes then how? (7.5)

6.

a. What is hexadecimal notation in IPv6 addressing? What are the advantages of IPv6 over IPv4? (5.5)

b. What is the nature of Internet Protocol (IP) reliable or unreliable? Justify your answer. Is there any technique available for flow control at network layer? If yes then explain. (5)

c. What do you mean by physical to logical address mapping? In what situations they are needed? How DHCP is better than BOOTP? (7)

7.

a. What is the difference between full close and half close of a TCP connection? Explain the actual situations when they are needed. (7.5)

b. How router is different from a gateway? (2.5)

c. Explain the concept of Link State routing. Compare and contrast Distant Vector routing with Link State routing. (7.5)

8.

a. Define congestion. What is the difference between open loop congestion control and closed loop congestion control? (6)

b. What is the role of DNS in Internet? What are the two techniques used for address resolution in DNS? (5)

c. What is the role of HTTP protocol? What is a proxy server and how is it related to HTTP? (3.5)

d. How does sky propagation differ from line-of-sight propagation? (3)

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