OBE

REFNO048621

B.Sc. (Hons.) Semester VI Examination 2021-22

Computer Science

CS-204 : Computer Networks

Time : 4:30 hours **Max. 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 08 प्रश्न पूँछे गये हैं जिनमें से 04 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 **4.30 hours** (Four hours and Thirty Minutes) 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.

   परीक्षा का कुल समय 4.30 घंटे का है जिसमें प्रश्नपत्र 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 A4 साइज के पन्ने पर काले अथवा नीले कलम से लिखा होना चाहिये। प्रत्येक प्रश्न का उत्तर 350 शब्दों तक तीन सादे पृष्ठ A4 साइज में होना चाहिये। प्रश्नों के उत्तर के लिए केवल एक तरफ के पृष्ठ का ही उपयोग किया जाना चाहिए।

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

P.T.O.

1) Write a short note on any five out of six techniques/protocols: [17.5]
   a) Amplitude Modulation (AM)
   b) Frequency-Division Multiplexing (FDM)
   c) Packet Switching
   d) Hypertext Transfer Protocol (HTTP)
   e) Circuit Switching
   f) Simple Mail Transfer Protocol (SMTP)

2) a) What is wireless (unguided) transmission media? What are the three major types of wireless transmission media, describe each in detail. [9]
   b) Describe the OSI model. How do the layers of the Internet model correlate to the layers of the OSI model? [8.5]

3) a) What is scrambling? What is the result of scrambling the sequence 11100000000000 using one of the following scrambling techniques? Assume that the last non-zero signal level has been positive. (i) B8ZS (ii) HDB3 (The number of nonzero pulses is odd after the last substitution) [9]
   b) What is the purpose of Pulse Code Modulation (PCM) technique? Describe the components of a PCM encoder with an example. [8.5]

4) a) Describe the following mechanisms for modulating digital data into an analog signal with examples: Amplitude shift keying (ASK), Frequency shift keying (FSK), Phase shift keying (PSK), and Quadrature amplitude modulation (QAM). [9]
   b) Station A needs to send a message consisting of 9 packets to Station B using a sliding window (window size 3) and go-back-n error control strategy. All packets are ready and immediately available for transmission. If every 5th packet that A transmits gets lost (but no acks from B ever get lost), then what is the total number of packets that A will transmit for sending the message to B? Explain through diagram. [8.5]

5) a) How the Hamming Code detects and corrects errors in the transmitted message? Explain the procedure with an example. [9]
   b) Compare the header format of Transmission Control Protocol (TCP) with User Datagram Protocol (UDP)? List the fields in the TCP header that are missing in UDP header. Give the reason for their presence in TCP. [8.5]

6) a) A company has a class C network address of 204.204.204.0. It wishes to have three subnets, one with 100 hosts and two with 50 hosts each. What will be the subnet address and subnet mask of the resultant sub-networks after dividing the network according to the company wish? [9]
   b) Describe the properties of Internet Protocol version 4 (IPv4). Draw the datagram format of IPv4 and explain the purpose of each field of the datagram. [8.5]

P.T.O.

7) a) Four l-kbps connections are multiplexed (using Synchronous Time-Division Multiplexing) together. A unit is 1 bit. Find (i) the duration of 1 bit before multiplexing, (ii) the transmission rate of the link, (iii) the duration of a time slot, and (iv) the duration of a frame. [9]

b) What are spread spectrum techniques? Describe each technique in details. [8.5]

8) a) Discuss the consequences of a node failure in each of the following network topologies: Mesh topology, Star topology, Bus topology and Ring topology. [9]

b) List three different techniques in serial transmission and explain the differences. [8.5]

END