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PES University, Bangalore

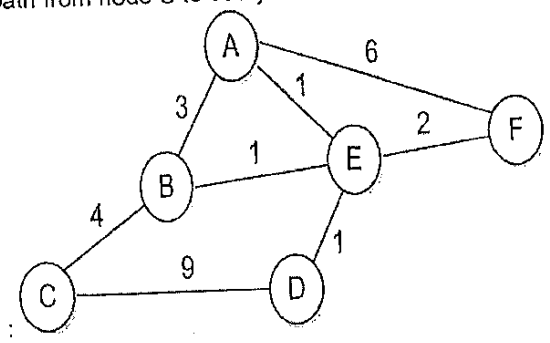
(Established under Karnataka Act No. 16 of 2013)

UC16MC502

END SEMESTER ASSESSMENT (ESA) MCA III SEMESTER- Dec. 2017

UC16MC502- COMPUTER NETWORKS

Time: 3 Hrs | Answer All Questions | Max Marks: 100

1.	a)	What is switching? Explain circuit switching and packet switching.	1+3+3
	b)	How long does it take to propagate a file of size 2.5KB over a link of distance 3000km. The propagation speed is $2.5*10^8$ m/sec and transmission rate is 5Mbps. There is no nodal processing delay and the data packets can be sent continuously (no queuing delay)?	6
	c)	Discuss the advantages of protocol layering.	4
	d)	What are the different types of addresses used and the unit of data transfer in transport layer, network layer and data link layer?	3
2.	a)	What is an API? Give example.	2+1
	b)	Why do you need an URL? What are its different parts? Explain .	1+4
	c)	Write the format of HTTP request header and Response header and also explain each part.	4 + 4
	d)	Write a note on DNS Resource records.	4
3.	a)	What do you mean by error control at transport layer? Explain how it is implemented in the transport layer of the TCP/IP protocol stack?	4+4
	b)	The following is part of a TCP header dump (contents) in hexadecimal format. **E2360017000000010000000500207FF.....** (For all the below questions the answer should be in base 10). i) What is the source port and Destination Port numbers? ii) What is the sequence number and acknowledgement number? iii) What is the length of the header? iv) What is the type of the segment? (use flags)	7
	c)	Discuss in detail the connection establishment procedure in TCP with the help of timeline diagrams.	5
4.	a)	Consider the following network Topology. Apply Dijkstra's Algorithm to calculate the shortest path from node C to every other node.  	6
	b)	Explain IPv4 Packet format with the description of each field.	3+3

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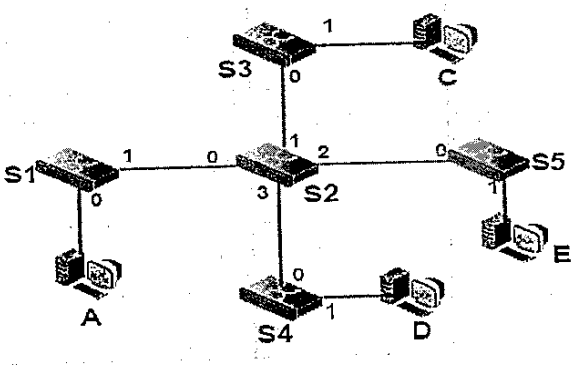
	c)	An ISP is granted a block 80.70.56.0/22. The ISP need to allocate addresses for two organizations each with 200 addresses, two organizations each with 90 addresses and three organizations each with 50 addresses. i) Find the **number and range** of addresses in the ISP block. ii) Find the **range of addresses** for each organization and the **range of unallocated addresses.**	8
5.	a)	Suppose we want to transmit the message 101011010 and protect it from errors using the divisor polynomial $x^4 + x^2 + x + 1$ i) Use polynomial long division to determine the message that should be transmitted. ii) Suppose the leftmost bit of the message is inverted due to noise on the transmission link, What is the result of the receiver's CRC calculation? How does the receiver know that an error has occurred?	4+4
	b)	What is the role of ARP in the link layer? Explain its working.	2+4
	c)	Consider the arrangement of learning switches as shown below. Explain what type of operation happens at S2 for each of the following transmissions? Also give the forwarding tables for each of the switches S1 – S5 after the following transmissions, assuming all tables are initially empty.  i) A sends to E ii) C sends to A iii) D sends to A iv) A sends to E	4+2