UNIT 2

PART – A

1. OSI stands for
   (a) Open Sessions Interconnection
   (b) **Open Systems Interconnection**
   (c) Open Systems Implementation
   (d) Open Segmentation Implementation

2. The layer responsible for process to process delivery is

   (a) network layer
   (b) **transport layer**
   (c) session layer
   (d) data link layer

3. A ____ is a hardware device which is used to receive, analyse and forward the incoming packets to another network.
   (a) Modem (b) **Router**
   (c) Repeater (d) USB
4. In the following pairs of OSI protocol layer/ sub-layer and its functionality, the incorrect pair is _____.
   (a) Network layer and routing
   (b) **Data link layer and bit synchronization**
   (c) Transport layer and end- to – end process communication
   (d) Medium access control sub-layer and channel sharing
5. The contention mode of MAC implementation is best suited for _____ traffic.
   (a) **Low** (b) Medium
   (c) High (d) Very High
6. What is the hamming distance between these 2 codes: 10010010 and 11011001?
   (a) 3 (b) **4** (c) 6 (d) 2
7. Which is the protocol that maps varying IP addresses to the Physical MAC Address of a machine in a LAN network?
   (a) ARQ (Automatic Repeat Request) (b) ARP (Address Resolution Protocol)
   (c) SLIP (Serial Line Internet Protocol) (d) PLIP (Parallel Line Internet Protocol)
8. Automatic repeat request error management mechanism is provided by _____
   (a**) logical link control sublayer**
   (b) media access control sublayer
   (c) network interface control sublayer
   (d) application access control sublayer
9. CRC stands for _____
   (a) **cyclic redundancy check** (b) code repeat check
   (c) code redundancy check (d) cyclic repeat check
10. When 2 or more bits in a data unit has been changed during the transmission, the error is called _____
    (a) random error (b) **burst error**
    (c) inverted error (d) double error
11. Which of the following uses a very thin glass or plastic fiber through which pulses of light travel?
    (a) Copper cable (b) **Optical fiber**
    (c) Twisted pair (d) Coax

12. Which feature of Go Back N ARQ mechanism possesses an ability to assign the sliding window in the forward direction?
    (a) Control Variables (b) **Sender Sliding Window**
    (c) Receiver Sliding Window (d) Resending of frames
13. Which category of HDLC frames undergoes error and flow control mechanisms by comprising send and receive sequence numbers?
    (a) U frames (b) I frames (c) **S frames** (d) T frames
14. Which type of Sframe in HDLC exhibit the correspondence of last three bits [N(R)] by defining the negative acknowledgement (NAK) number with the code value of '01'?
    (a) Receive ready (b) Receive not ready
    (c) **Reject** (d) Selective Reject
15. For pure ALOHA, the maximum channel utilization is
    (a) 100% (b) 50% (c) 36% (d) **18%**
16. Determine the maximum length of the cable (in km) for transmitting data at a rate of 500 Mbps in an Ethernet LAN with frames of size 10,000 bits. Assume the signal speed in the cable to be 2,00,000 km/s.
    (a) 1 (b) **2** (c) 2.5 (d) 5
17. Let G(x) be the generator polynomial used for CRC checking. What is the condition that should be satisfied by G(x) to detect odd number of bits in error?
    (a) G(x) contains more than two terms
    (b) G(x) does not divide 1+x^k, for any k not exceeding the frame length
    (c) **1+x is a factor of G(x)**
    (d) G(x) has an odd number of terms
18. The message 11001001 is to be transmitted using the CRC polynomial x^3 + 1 to protect it from errors. The message that should be transmitted is:
    (a) 11001001000 (b) **11001001011** (c) 11001010 (d) 110010010011
19. A bit-stuffing based framing protocol uses an 8-bit delimiter pattern of 01111110. If the output bit-string after stuffing is 01111100101, then the input bit-string is
    (a) 0111110100 (b) **0111110101** (c) 0111111101 (d) 0111111111
20. Which of the following statements is TRUE about CSMA/CD
    (a) IEEE 802.11 wireless LAN runs CSMA/CD protocol
    (b) Ethernet is not based on CSMA/CD protocol
    (c) **CSMA/CD is not suitable for a high propagation delay network like satellite network**
    (d) There is no contention in a CSMA/CD network
21. Which of the following statement is False about the efficiency of the given channel?
    (a) If we want to send big packets on the channel, then Stop and Wait is good choice.
    (b) If length of packet increases, efficiency of channel also increases.
    (c) **Distance between sender and receiver is directly proportional to efficiency of channel.**
    (d) Efficient might be less if capacity of channel is high
22. Which of the following devices takes data sent from one network device and forwards it to the destination node based on MAC address ?
    (a) Hub (b) Modem (c) **Switch** (d) Gateway
23. In CRC if the data unit is 100111001 and the divisor is 1011 then what is dividend at the receiver?
    (a) 100111001101 (b) **100111001011** (c) 100111001 (d) 100111001110
24. In a Go-Back-N ARQ, if the window size is 63, what is the range of sequence numbers?
    (a) **0 to 63** (b) 0 to 64
    (c) 1 to 63 (d) 1 to 64
25. In Go-Back-N ARQ, if frames 4, 5, and 6 are received successfully, the receiver may send an ACK _____ to the sender.
    (a) 6 (b) **7** (c) 5 (d) 8

26. HDLC is an acronym for _____.
    (a) Half-duplex digital link combination
    (b) Host double-level circuit
    (c) High-duplex line communication
    (d) **High-level data link control**
27. In Selective Repeat ARQ, if 5 is the number of bits for the sequence number, then the maximum size of the receive window must be _____.
    (a) 1 (b) 15 (c) **16** (d) 31
28. In Stop-and-Wait ARQ, the acknowledgment number always announces in _____ arithmetic the sequence number of the next frame expected.
    (a) modulo-m (b) **modulo-2** (c) modulo-4 (d) modulo 10
29. In ___ configuration, an HDLC primary station and several secondary stations are connected.
    (a) **an unbalanced** (b) a symmetrical
    (c) a balanced (d) an assymetrical
30. The HDLC flag field is
    (a) 01000010 (b) 01010101
    (c) 10000001 (d) **01111110**

PART-B

1. What is hamming distance? Give one example with hamming distance.
2. What are the configuration modes possible in HDLC?
3. What are MAC protocols?
4. Compare and contrast flow control and error control.
5. Explain the control fields of I frame.
6. Define ARQ and list its types.
7. Explain the control fields of U frame.
8. Define polling.
9. Draw the flow diagram of stop and wait ARQ
10. Generate the code word at the sender site for the data word 100100 and divisor is 1101 using CRC.
11. Write the difference between Go back-N ARQ and selective repeat protocols.
12. What are the persistence methods in CSMA?
13. What are the types of errors and write the error detection methods?
14. What is bit stuffing? Why it is needed?
15. What are the station types and its nodes of operation in HDLC

PART-C

1. Explain HDLC protocol in detail
2. Find the code word and syndrome for the following data word: 1010011010 and the divisor: 10111 using CRC decoder and encoder.
3. Explain in detail about Go back-N ARQ protocol with timing diagram.
4. Find the code word and the syndrome for the following data word: x^6+x^3 and the divisor: x^3+x^2+1 using polynomials.
5. Explain in detail about Stop and wait protocol with timing diagram
6. Discuss about CSMA/CD.