

**SUBJECT : FUNDAMENTALS OF DATA COMMUNICATION**

Day : **Monday**                      **S-2018-2235**                      Time : **02.30 PM TO 05.30 PM**  
Date : **21/05/2018**                      Max. Marks : 60

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**N.B.:**

- 1) All questions are **COMPULSORY**.
  - 2) Figures to the right indicate **FULL** marks.
  - 3) Draw neat and labeled diagrams **WHEREVER** necessary.
  - 4) Assume suitable data if necessary.
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- Q.1** a) With neat schematic diagram explain the operation of the basic communication system. [05]  
b) State the advantages, disadvantages and applications of serial transmission. [05]

**OR**

- a) Calculate the maximum bit rate of channel having bandwidth 1600 Hz if [05]  
i) S/N ratio is 0db                      ii) S/N ratio is 20db  
b) Define, bit interval, bit rate and baud rate. [05]

- Q.2** a) With the help of diagram explain amplitude modulation. Write mathematical representation of amplitude modulation signal  $M < 1$ ,  $M = 1$ ,  $M > 1$ . [05]  
b) Compare PM and FM systems. [05]

**OR**

- a) For a half-duplex FSK transmission the bandwidth of medium is 8000 Hz if the frequency difference between the two carries is 4000 Hz calculate the maximum bit rate. [05]  
b) Explain the following terms with respect to delta modulation: [05]  
i) Slope overload                      ii) Granular noise

- Q.3** a) Explain the need of error detecting and correcting codes. [05]  
b) Write a short note on : ARQ systems. [05]

**OR**

- a) Explain the following terms with reference to information theory. [05]  
i) Information rate                      ii) Entropy                      iii) Channel capacity  
b) Write a short note on : Linear Block Codes. [05]

- Q.4** a) Explain various station types and configurations used in HDLC data link level protocol. [05]  
b) Explain the terms: i) Virtual circuits                      ii) Trunk circuits. [05]

**OR**

- a) State the difference between circuit switching and packet switching. [05]  
b) Write a short note on : x.25. [05]

- Q.5** a) Compare: i) Step index and graph index fibers. [05]  
ii) Single mode and multimode fibers.  
b) Explain different losses in optical fibers. [05]

**OR**

- a) With neat diagram describe basic optical fiber transmission system. [05]  
b) Write a short note on : Infrared transmission. [05]

- Q.6** a) Explain how handoff is done in cellular telephony. [05]  
b) Describe in detail roaming concept. [05]

**OR**

- a) Write short notes on : i) GSM                      ii) Bluetooth [05]  
b) With neat diagram describe cell structure in cellular system and define frequency reuse. [05]