DECEMBER 2019

EXAMINATION TIME TABLE
PROGRAMME - B.E. (Electronics & Tele-communication) (Choice Based)
SEMESTER - VII

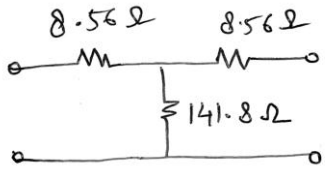
Days and Dates	Time	Paper Code	Paper
Thursday, November 14, 2019	10:30 a.m. to 01:30 p.m.	42451	Microwave Engineering
Monday, November 18, 2019	10:30 a.m. to 01:30 p.m.	42452	Mobile Communication System
Wednesday, November 20, 2019	10:30 a.m. to 01:30 p.m.	42453	Optical Communication
Friday, November 22, 2019	10:30 a.m. to 01:30 p.m.	42454	Department Level Optional Course III: Neural Networks & Fuzzy Logic
Friday, November 22, 2019	10:30 a.m. to 01:30 p.m.	42455	Big Data Analysis
Friday, November 22, 2019	10:30 a.m. to 01:30 p.m.	42456	Internet Communication Engineering
Friday, November 22, 2019	10:30 a.m. to 01:30 p.m.	42457	CMOS Mixed Signal VLSI
Friday, November 22, 2019	10:30 a.m. to 01:30 p.m.	42458	Embedded System
Tuesday, November 26, 2019	10:30 a.m. to 01:30 p.m.	42459	Institute Level Optional Course-I :- Product Life Cycle Management
Tuesday, November 26, 2019	10:30 a.m. to 01:30 p.m.	42460	Reliability Engineering
Tuesday, November 26, 2019	10:30 a.m. to 01:30 p.m.	42461	Management Information Systems
Tuesday, November 26, 2019	10:30 a.m. to 01:30 p.m.	42462	Design of Experiments
Tuesday, November 26, 2019	10:30 a.m. to 01:30 p.m.	42463	Operations Research
Tuesday, November 26, 2019	10:30 a.m. to 01:30 p.m.	42464	Cyber Security Laws
Tuesday, November 26, 2019	10:30 a.m. to 01:30 p.m.	42465	Disaster Management & Mitigation Measures
Tuesday, November 26, 2019	10:30 a.m. to 01:30 p.m.	42466	Energy Audit & Management
Tuesday, November 26, 2019	10:30 a.m. to 01:30 p.m.	42467	Development Engineering

Time : 3 Hrs **Marks : 80**

Note:

1. Question **No.1** is **compulsory.**
2. Attempt **any three** from the remaining questions.
3. Assume suitable data if required.
4. Figures on the right hand side indicate full marks.

1. a) Design Circulator using Magic Tee. **(05)**
   b) Explain Amplification Process in TWT. **(05)**
   c) Compare Isolator and Gyrator. **(05)**
   d) Calculate S parameters for 3dB Attenuator. Assume Zo = 50 Ω **(05)**



2. a) Explain the significance of RWH theory and explain two valley models in GUNN diode. **(10)**
   b) What is the importance of beam coupling coefficient? Derive the expression for velocity modulation in two cavity klystron. **(10)**

3. a) Derive the expression for various parameters that describe the wave propagation in TE/TM mode in Rectangular Waveguide **(10)**
   b) Explain Impedance measurement Technique in microwave. **(10)**

4. a) Design a two lumped element matching network at frequency 500 MHz frequency to match Z_L =200-j100 ohms with a transmission line of Zo=100 ohms using Smith Chart. **(10)**
   b) Draw and explain two-hole directional coupler and derive the S-parameter for the same. **(10)**

5. a) Design two single stub matching network (shunt- short) for a given load of 60-j80 ohms to match with a 50 ohms transmission line using Smith Chart. **(10)**
   b) Compare HMICs and MMICs with suitable diagram. **(10)**

6. Write short note on ***any two*** **(20)**
   a) Magnetron
   b) Transit time diodes
   c) HEMT

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(3 Hours) **[Total Marks : 80]**

Please check whether you have got the right question paper.

N.B.: 1) Question No. 1 is compulsory.
2) Attempt any three from remaining questions.

1. a) Define following terms. **(05)**
i) Control channel
ii) Forward channel
iii) Hand-off
iv) Reverse channel
v) Page

b) What is frequency Re-use? Derive the relationship between capacity C and cluster size N. **(05)**

c) List and discuss factors influencing small scale fading. **(05)**

d) Explain soft-hand-off and power control in 3G. **(05)**

2. a) For given path loss exponent (a) n = 4 and (b) n = 3, find the frequency re-use factor and the cluster size that should be used for maximum capacity. The S/I ratio of 15db is minimum required for satisfactory forward channel performance of a cellular system. There are six co-channel cells and all of them at same distance from mobile use suitable approximations. **(10)**

b) Draw the block diagram and explain GSM architecture in detail indicating all the interfaces. **(10)**

3. a) Explain IS-95 forward and reverse channel structure in details. **(10)**

b) Describe GSM frame structure in detail. **(10)**

4. a) Compare IS-95, W-CDMA and CDMA 2000 with respect to channel Bandwidth, chip rate, modulation schemes, data rates and frame size. **(10)**

b) Sketch UMTS Network Architecture and explain it in detail. Give in brief Features and services provided by UMTS. **(10)**

5. a) Draw and explain 3GPP LTE architecture and also discuss frames and slots in LTE. **(10)**

b) Explain the concept of MIMO with respect to 4G technology. **(10)**

6. Write short notes on **Any Two**:- **(20)**
a) Indoor propagation Models
b) Rake Receiver
c) Software defined radio

Time : 3 Hours **Marks: 80**

N.B. : (1) Question No. 1 is compulsory
(2) Attempt any three questions out of the remaining five questions.
(3) Figures to the right indicate full marks.
(4) Assume suitable data wherever necessary and justify the same.

1. Solve **any four**
   (a) Differentiate LED and LASER. 5
   (b) Explain different types of fibers with their refractive index profile and-mention its dimensions. 5
   (c) Draw and explain fusion splicing. 5
   (d) Explain the concept of Fiber Bragg Grating. Give its applications. 5
   (e) Derive expression for cut off wavelength for single mode step index fiber 5

2. (a) Explain in brief VAD and MCVD fiber fabrication techniques. 10

   (b) Explain linear and non-linear scattering losses in optical fiber. 10

3. (a) What are the different factors responsible for attenuation and dispersion in optical fiber. 10

   (b) Explain in detail working, principle of RAPD. Why it is called reach through APD and compare its working with PIN diode? 10

4. (a) Explain working principle of EDFA with diagram . 10

   (b) An analog optical fiber system using LASER with 3 dBm optical power into air. A coupling loss of 17.5 dB is present while launching power into fiber. Length of fiber is 6 km with a loss of 5dB/km. It is spliced at every 1.5 km with 1.1dB loss per splice. Connector loss at receiver is 0.8dB. The PIN receiver has sensitivity of -54 dBm. Estimated safety margin is 4 dB. Design the link power budget. 10

5. (a) If a multimode step index fiber having the core refractive index of 1.5, cladding refractive index of 1.38, core radius of 25 µm operates at a wavelength of 1300 nm. Calculate - 10
      (i) Numerical Aperture.
      (ii) Normalized frequency
      (iii) Solid acceptance angle.
      (iv) Total no. of modes entering the fiber.

   (b) Draw and explain block diagram of cutback method of attenuation measurement. 10

6. Write short note on: - 20
      (i) RF over Fiber
      (ii) Quantum Well Laser
      (iii) Solitons
      (iv) Optical Switches

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(3 Hours) **[Total Marks: 80]**

Instructions:

1. Question No.1 is compulsory
2. Attempt any Three from the remaining
3. Figures to the right indicate full marks
4. Assume suitable data if necessary.

Q.1. (a) Compare Big Data Analysis with Traditional Data Mining and warehousing system (5)
(b) Explain "Shuffle & Sort" phase and "Reducer phase" in Map Reduce. (5)
(c) Find Jaccard Distance and Cosine Distance between the following pairs of set (5)
X=(0,1,2,4,5,3) & Y=(5,6,7,9,10,8)
(d) Define Social Networks and Social Network Mining (5)

Q.2 (a) Explain NoSQL Business drivers and also describe various architecture Patterns of NoSQL. (10)
(b) What is the MapReduce? Explain the role of Combiner with the help of an example. (10)

Q.3. (a) Explain Page Rank algorithm with suitable example (10)
(b) Elaborate Collaborative Filtering System. How is the system different from a content based system. (10)

Q.4. (a) Explain Park-Chen-Yu algorithm with suitable example. (10)
(b) Explain the Physical Architecture of Hadoop. State its Limitations. (10)

Q.5. (a) Describe the Characteristics of Big Data with suitable example. State the types of Big data (10)
(b)Distinguish the following (10)
(i) Document store & Column family data store.
(ii) RDBMS & NoSQL database.

Q.6. Write Short Note on. **(any two)** (20)
(a)Hadoop Ecosystem
(b)Data Sream Management System
(c) Matrix Multiplication by MapReduce
(d) Network Traffic Analysis.

(3 Hours) **(Total Marks: 80)**

N.B.: (1) **Question No.1** is **compulsory**.
(2) Answer **any three** out of remaining **five** Questions**.**
(3) **Assumptions** made should be **clearly stated.**
(4) **'Marks'** to the **right** indicate **full marks.**
(5) Illustrate answers with **sketches** whenever **required.**
(6) **Answer to questions should be grouped and written together.**

1. Attempt **any 4** :

a) Explain the "Tunneling Procedure" in IPv6 protocol. **05**

b) Explain the different RTCP messages used for real time communication. **05**

c) Explain the need of audio or video compression in multimedia communication. **05**

d) Differentiate between leaky bucket and token bucket methods of traffic shaping. **05**

e) How is SCTP association different with respect to TCP connection establishment? **05**

2. **a)** An ISP is granted a block of addresses starting with 190.200.0.0/16. **12**
What is the meaning of "/16"?
This ISP needs to distribute these addresses to three groups of customers as follows :
i) First group has 64 customers each needing 256 addresses.
ii) Second group has 128 customers each needing 128 addresses.
iii) Third group has 128 customers each needing 64 addresses.
Allocate the sub-blocks and find out how many addresses are still available after these allocations.

b) With the help of a transition diagram, explain DHCP protocol. Also, calculate the renewal and rebinding time if lease time provided is 8 hours. **08**

3. **a)** Explain the different traffic scheduling techniques used for providing QoS. **10**

b) Explain in brief the characteristics "Jitter", "timestamp", "Mixing" and "Translation" in real time audio and video communication with respect to RTP. **10**

4. **a)** Elaborate on PGP scenarios for Application layer security. **10**

b) Explain how DNS queries are resolved by iterative and recursive methods and also explain why caching is required in DNS? **10**

5. **a)** Compare the procedures : streaming of stored audio/video, streaming live audio/video and interactive audio/video over Internet. **10**

b) Explain MPEG for video compression in detail with reference to JPEG compression. **10**

6. Write a note on (**any four) :** **20**

a) SSL/TSL protocol for transport layer security

b) H.261

c) ICMPv6 messages

d) RSVP : reservation protocol

Time : 3 Hrs **Marks: 80**

Instructions
1. Q1 is compulsory.
2. Attempt any three out of the remaining five questions.
3. Assume suitable data.

Q1. Attempt any **FOUR.** **(20)**

a) What is watchdog timer, its use and typical application for an embedded system.
b) Explain I2C in brief.
c) Explain various types of operating systems.
d) Differentiate between embedded systems and general computing systems.
e) Explain pre-emptive scheduling in RTOS.
f) What is process and various states that a process can lie in an embedded system?

Q2.a) Explain various steps of design of digital camera using microcontroller and CCDPP. **(10)**

b) Describe any two wireless communication means for embedded systems. **(10)**

Q3. a) Describe design metrics and optimization challenges for embedded systems. **(10)**

b) What is interprocess communication (IPC) in RTOS? Explain various IPCs. **(10)**

Q4. a) Define finite state machine (FSM). Draw and explain FSM for automatic chocolate vending machine. **(10)**

b) Explain various task scheduling models in RTOS. **(10)**

Q5. a) Write a note on program models: DFG, FSM, Petri-net, UML. **(10)**

b) Compare RISC and CISC architectures along with advantages and disadvantages. **(10)**

Q6. a) How to choose RTOS for a given embedded system application. **(10)**

b) What is CAN protocol. Describe topology and frame formats with significance of fields. **(10)**

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Time: 3 Hours **Marks: 80**

N:B (1) Question 1 is Compulsory.
(2) Attempt any three from the remaining questions.
(3) Figures to the right indicate full marks.

Q.1 Attempt any four **5*4=20M**

A What is information system? Explain the necessary element with neat diagram
B Define Big Data and discuss its basic characteristics?
C Explain the Ethical issues and threats of information security?
D Describe how social computing inspires customer service
E Differentiate between computer network wired and wireless technology

Q.2 A List the types of Information system? Explain in brief **10M**
B Discuss competitive advantage achieved in Information System **10M**

Q.3 A Explain the architecture of Data mart and Data warehouse in an organization **10M**
B Discuss the Impact of BI on Decision Making. **10M**
10M

Q.4 A What are the potential benefit of social commerce to the customers and to the business? **10M**
B What are major security threats to the information system? Discuss the measures taken to control information security. **10M**

Q.5 A Discuss the significance of social computing in marketing in detail **10 M**
B What are the functional areas of Information system. Explain in detail **10 M**

Q.6 A Define CRM. Describe the different types of CRM **10M**
B Design MIS for the Educational System **10M**

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(3 Hours) **(Total Marks : 80)**

N.B: 1) **Q.1** is **compulsory.**
2) Attempt **any THREE** questions from the remaining questions.
3) Assume suitable **data** if **necessary**.

Q.1 Attempt **any four** :

a) Compare active attacks vs Passive attacks. [5]

b) Explain various types of key-loggers in brief. [5]

c) Classify the cybercrimes and explain any one briefly. [5]

d) Explain how the appeals can be made under The IT ACT 2000. [5]

e) Write brief note on : Cyber-terrorism. [5]

Q.2 a) How criminals plan the attack? Discuss various steps involved [10]

b) Explain how Intellectual property laws protect the rights of the owner of the intellectual Property. [10]

Q.3 a) Compare Vishing, Phishing and Smishing in cyber security. [10]

b) What is E-commerce? Explain different types of e-commerce with suitable examples. [10]

Q.4 a) What is Bluetooth hacking? Explain Bluetooth hacking tools in brief. [10]

b) How the Indian penal code IPC 1860 addresses cybercrime? [10]

Q.5 a) Discuss basic security precautions to be taken to safeguard Laptops and wireless devices. [10]

b) What is E-contract? Discuss E-contract Act 1872. [10]

Q.6 Write short note on **(Any 2)** : [20]

1) Computer Sabotage.
2) Indian Information Technology Act 2000
3) Write key IT requirements for SOX and HIPAA.
