G 5055   (Pages : 2)   Reg. No...................................

Name....................................

B.TECH. DEGREE EXAMINATION, MAY 2017

Eighth Semester

Branch : Electronics and Communication Engineering

EC 010 801—WIRELESS COMMUNICATION (EC)

(New Scheme—2010 Admission onwards)

[Regular]

Time : Three Hours   Maximum : 100 Marks

Part A

Answer **all** *questions.*
Each question carries 3 marks.

1. Why hexagonal cell geometrics are always preferred ?

2. Mention the different diversity techniques.

3. Differentiate between Narrowband systems and Wide band systems.

4. Draw the frame structure of a GSM signal.

5. Mention the features of PDC.

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*
Each question carries 5 marks.

6. A cellular system having a seven-cell cluster layout with omni-directional antennas has been performing satisfactorily for a required signal to interference ratio of 15 dB. However due to the need for increasing the number of available channels, a 60° sectoring of the cells has been introduced. By what percentage can the number of channels N_{total} be increased assuming a path-loss component $n = 4$?

7. Consider a transmitter which radiates a sinusoidal carrier frequency of 1850 MHz. For a vehicle moving 60 mph, compute the received carrier frequency if the mobile is moving (a) directly toward the transmitter (b) directly away from the transmitter.

8. List some of the features of FDMA.

9. Explain about the GSM channel coding for data channels and GSM channel coding for the control channels.

10. Explain the features of DECT.

(5 × 5 = 25 marks)

Part C

Answer all questions.
Each full question carries 12 marks.

11. (a) Explain the channel assignment strategies.   (6 marks)

    (b) Derive the expression for the blocking probability (Erlang B formula) of a trunked systems which provides no queuing for blocked calls.

                                                                      (6 marks)

Or

12. Explain how to improve cellular system capacity through cell splitting and sectoring.

13. With a neat diagram, explain the two ray ground reflection model.

Or

14. Explain the different diversity techniques used for mobile wireless radio system.

15. Discuss in detail about frequency hopped and direct sequence spread spectrum techniques.

Or

16. Explain the techniques of TDMA in detail.

17. With a neat diagram, explain the principles and architecture of GSM system.

Or

18. Explain the serving frequency bands and objectives of GSM.

19. Explain the reverse CDMA channel modulation with a neat block diagram.

Or

20. Write notes on the following digital cellular standards :

    (a) PDC ; (b) PHS.

                                                      (5 × 12 = 60 marks)

G 5068

(Pages : 2)

Reg. No.................................

Name..................................

B.TECH. DEGREE EXAMINATION, MAY 2017

Eighth Semester

Branch : Electronics and Communication Engineering

EC 010 802 – COMMUNICATION NETWORK [EC]

(New Scheme – 2010 Admission onwards)

[Regular/Supplementary]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all *questions.*

Each question carries 3 marks.

1. Explain Bit stuffing and Destuffing.

2. Define Repeater and Hub.

3. What is IP security?

4. Explain the features of Asynchronous Transfer Moder (ATM).

5. What are IP security services?

(5 × 3 = 15 marks)

Part B

Answer all *questions.*

Each question carries 5 marks.

6. Explain the different Network Topologies.

7. Explain Token passing method of controlled access of the channel.

8. What are the differences between Virtual circuit and Datagram subnets?

9. Explain the routing of a call using a virtual switch in an ATM network.

10. Explain the different categories of Security Services.

(5 × 5 = 25 marks)

Part C

Answer all *questions.*

Each full question carries 12 marks.

11. (a) With a neat diagram, explain the TCP/IP reference model giving a brief description of the protocols in each layer.

    (b) Explain Circuit Switching.

(8 + 4 = 12 marks)

Or

Turn over

12. (a) Describe the ISO-OSI reference model of computer network. Discuss the function of each layer.

    (b) What are the different airframe components of a rocket?

                                        (8 + 4 = 12 marks)

13. (a) Define Random access method. Explain pure ALOHA and slotted ALOHA protocols.

    (b) Explain CSMA Protocol.

                                          (8 + 4 = 12 marks)

Or

14. (a) What are the advantages of dividing an ethernet LAN with a bridge? Explain with a neat diagram.

    (b) Pure Aloha network transmits 200 bit frames on a shared channel of 200 Kbps. What is the throughput if the system produces (i) 1000 frames/sec ; (ii) 500 frames/sec ; (iii) 250 frames /sec.

                                          (6 + 6 = 12 marks)

15. (a) With a necessary diagram, explain distance vector routing.

    (b) What is ICMP? Write the general format of ICMP messages.

                                          (8 + 4 = 12 marks)

Or

16. (a) Explain IPV_4 header format.

    (b) Expain IPV_6 addresses.

                                          (4 + 8 = 12 marks)

17. (a) With a neat diagram, explain ATM Header Structure.

    (b) Explain ATM Addressing.

                                          (8 + 4 = 12 marks)

Or

18. (a) With a neat diagram, explain ATM Signalling.

    (b) Explain ATM adaptation layer.

                                          (6 + 6 = 12 marks)

19. (a) Write a note on PGP random member generation.

    (b) What are the different types of firewall and explain packet filtering router in detail?

Or

20. (a) Explain arbitrated digital signature technique.

    (b) Explain all the steps mentioned in digital signature algorithms.

                                          (6 + 6 = 12 marks)

                                          [5 × 12 = 60 marks]

G 5081   (Pages : 2) -   Reg. No.............................

                                                              Name.................................

B.TECH. DEGREE EXAMINATION, MAY 2017

Eighth Semester

Branch : Electronics and Communication Engineering

EC 010 803—LIGHT WAVE COMMUNICATION (EC)

(New Scheme–2010 Admission onwards)

[Regular/Supplementary]

Time : Three Hours   Maximum : 100 Marks

Part A

Answer all questions.
Each question carreis 4 marks.

1. State and explain Mode coupling.

2. For a step index fiber the value of numerical aperture (N. A.) is 0.22 and $\Delta = 0.0112$ Compute the refractive indices of the core and cladding material of a fiber. Explain the steps.

3. What are the types of scattering ? Explain them.

4. What are the types of fiber misalignments ? Which is the most commonly occurring one ? Why ?

5. Mention the characteristics of LED and explain them.

6. Derive the Quantum efficiency and responsivity of APD.

7. Explain the characteristics of MZ optical modulator.

8. What is Sparse wavelength conversion ?

9. Enumerate the functions and features of WRN.

10. Enumerate the steps to design node with an example.

                                                              (10 × 4 = 40 marks)

Part B

Answer all questions.
Each full question carreis 12 marks.

11. Derive the cylindrical wave equations for multimode step index fibers. Explain the steps in detail.

Or

12 (a) Define and explain V number. A SI fiber has a NA of 0.16 and n_2 of 1.47. Determine θ_a of fiber when it is placed in a gel whose refractive index is 1.3 and critical angle at core-clad interface.

                                                              Turn over

(b) A typical step Index fiber has a core refractive index of 1.48 , a relative refractive index difference of 0.001, and a core radius of 3μm . Calculate the normalized frequency parameter of the fiber. What does it signify ?

13. Explain the design steps of a star fiber coupler with a neat diagram. Enumerate and explain the losses associated with the optical coupler.

Or

14. List and explain the permanent and semi permanent splicing techniques with neat diagrams. Compare and contrast them.

15. Define and explain pumping and its types. Explain the need for population inversion. Also derive the condition for lasing.

Or

16. Compare and contrast PiN photo diode and APD. Derive the SNR for both. Explain the concept of APD.

17. A Fiber Raman amplifier is pumped in backward direction using 1W of power. Find the output Power, when a 2μW signal is injected into a 3km long amplifier. Assume losses of 0.253 dB/Km and 0.272 dB/Km at signal and pump wavelengths respectively.

$A_{eff} = 55 \, \mu \, m^2$ and $g_R = 6.2 \times 10^{-14}$ m/W. Neglect gain saturation.

Or

18. Compare between the Doped Fiber Amplifier (DFA) and Semi-conductor Optical Amplifier (SOA). Explain the amplification mechanism of Erbium doped fiber Amplifier with required energy level diagram.

19 (a) What is the principle of Routing in convertible networks ? Explain,

(b) What is grooming ? Briefly comment on it.

Or

20. Write short notes on :

1. Power budget.

2. Fiber point to point communication requirements.

(5 × 12 = 60 marks)

B.TECH. DEGREE EXAMINATION, MAY 2017

Eighth Semester

Branch : Electronics and Communication Engineering

EC 010 804 L03—SECURE COMMUNICATION (Elective III) [EC]

(New Scheme—2010 Admission onwards—Regular/Supplementary)

Time : Three Hours Maximum : 100 Marks

Part A

Answer all questions.

Each question carries 3 marks.

1. List the advantages of arithmetic over $GF(2^n)$ compared to arithmetic over $GF(p)$.

2. What do you mean by one time pad.

3. Explain active and passive attack with example ?

4. Define public key certificates.

5. What is intrusion ? How intrusion can be detected.

$(5 \times 3 = 15 \text{ marks})$

Part B

Answer all questions.

Each question carries 5 marks.

6. Determine the gcd (24140 ,16762) using Euclidean Algorithm.

7. Encrypt the message "VERYGOOD" by using 2 × 2 play fair cipher with a key $\begin{pmatrix} 7 & 6 \\ 2 & 5 \end{pmatrix}$.

8. Differentiate between differential and linear cryptanalysis.

9. Encrypt the message M = 77 using $n = 35$, assume suitable values of 'e' and 'd'.

10. Discuss about statistical anomaly detection.

$(5 \times 5 = 25 \text{ marks})$

Turn over

Part C

Answer all questions.
Each full question carries 12 marks.

11. Explain extended Eucliden Algorithm and find the multiplicative inverse of 550 mod 1769.

Or

12. Perform the arithmetic : $f(x) + g(x), f(x) - g(x), f(x) \cdot g(x), f(x)/g(x)$ over GF (2) with an irreducible polynomial $x^3 + x + 1$ where $f(x) = x^2 + x + 1$ and $g(x) = x + 1$.

13. Explain Caser, Monoalphabetic, Poly alphabetic, Play Fair and Hill Ciphers.

Or

14. Explain Security Attacks and Security Services.

15. Describe the data encryption standard (DES) algorithm with a neat block diagram.

Or

16. Explain the AES substitute byte , shift row, mux column and add key round transformations.

17. Explain how the encryption, decryption and key generation procedures are carried out in RSA. Also perform the encryption and decryption for $p = 7, q = 11, e = 17$ and $m = 8$.

Or

18. Draw the model of public key cryptosystem and list the application of public key cryptosystem

19. Write a short note on :

    (i)   Statistical anomaly detection.

    (ii) Honey pot.

    (iii) Distributed intrusion detection.

Or

20. Write a note on :

    (i) Distributed Intrusion Detection.

    (ii) Password management.

                                                    (5 × 12 = 60 marks)

B.TECH. DEGREE EXAMINATION, MAY 2017

Eighth Semester

Branch : Electronics and Communication Engineering

EC 010 805 G02—E-LEARNING

(Elective IV)

Time : Three Hours   Maximum : 100 Marks

Part A

*Answer **all** questions.*
Each question carries 3 marks.

1. Outline the reasons for the prevalence of e-learning.

2. Is the Internet changing teaching and learning practice ? Comment.

3. Why the analysis and design stages of e-content development are essential to ensure course effectiveness and learners' motivation and participation ?

4. What is multi-channel learning ?

5. List the key challenges around the use of e-assessment in the training sector today.

(5 × 3 = 15 marks)

Part B

*Answer **all** questions.*
Each question carries 5 marks.

6. What is a virtual class room ? Discuss.

7. Outline the role of satellite broadcasting in e-learning.

8. Explain the importance of knowledge management in e-learning.

9. Outline the role of teachers in e-learning.

10. Comment on the bottlenecks faced by educational institutions in using e-learning environments.

(5 × 5 = 25 marks)

Part C

Answer all questions.
Each question carries 12 marks.

11. (a) What is e-learning ? What are its components ? Discuss.

(8 marks)

(b) Outline the barriers to e-learning .

(4 marks)

Or

12. Outline the pros and·cons of e-learning *vs.* classroom learning.

13. What is video conferencing ? Present a scenario where video conferencing can be used in an educational institution to promote learning.

Or

14. Outline how chat, discussion forums and bulletin boards promote learning.

15. What is e-content ? Outline the analysis and design activities involved in e-content design.

Or

16. What is knowledge acquisition ? Discuss the knowledge acquisition process for e- learning.

17. Present an overview of the types of interactions in the learning process.

Or

18. What is collaborative learning ? Present a framework for collaborative learning and discuss the same.

19. What can e-assessment do for teaching and learning ? Discuss with an example.

Or

20. Appraise the costs for developing and using e-learning environments.

(5 × 12 = 60 marks)

G 5154

(Pages : 2)

Reg. No.................................

Name...................................

B.TECH. DEGREE EXAMINATION, MAY 2017

Eighth Semester

Branch : Electronics and Communications Engineering / Electrical and Electronics / Electronics and Instrumentation / Instrumentation and Control Engineering

INTELLECTUAL PROPERTY RIGHTS (Elective IV) [EC, EE, EI, IC]

(New Scheme—2010 Admission onwards—Regular/Supplementary)

Time : Three Hours

Maximum : 100 Marks

Part A

Answer **all** *questions.*
Each question carries 3 marks.

1. Explain how the interest of the society is considered in IPR.

2. Why patent is required.

3. Describe patentable inventions

4. Comment on copyright law in India

5. What is the importance of trademark ?

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*
Each question carries 5 marks.

6. Explain the rationale behind IP.

7. Write short notes on transitional period.

8. What are the fights of patentee ?

9. Explain steps in applying for design registration.

10. Explain trademark law in India.

(5 × 5 = 25 marks)

Turn over

Part C

Answer all questions.
Each question carries 12 marks.

11. Explain different types of IP.

Or

12. Explain how IPRs enforced in India.

13. Explain the role and participation of India with WTO/TRIPS agreement.

Or

14. Explain the patent law implemented in India and its effectiveness.

15. Explain the limitations of particulars right and infringement of patent.

Or

16. Explain the procedure of obtaining patent.

17. What is copy right ? Explain the need and process of registering copy right.

Or

18. Explain the rights of broadcasters and performers.

19. Explain the process of trademark registration.

Or

20. Explain geographical indications and registration.

(5 × 12 = 60 marks)