Code No: **RT42034D** **R13** **Set No. 1**

IV B.Tech II Semester Regular/Supplementary Examinations, April - 2018

QUALITY AND RELIABILITY ENGINEERING

(Mechanical Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any THREE questions from Part-B
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PART–A *(22 Marks)*

1. a) Discuss quality goals. [4]
   b) With suitable example explain control charts for non-confirming units. [4]
   c) Find a single-sampling plan for which p_1=0.02, α=0.01, p_2=0.06, and β=0.10 [3]
   d) Describe the concept of six-sigma quality. [4]
   e) Deduce the relationship between f(t), R(t) and λ(t). [3]
   f) Explain the term "Reliability prediction". [4]

PART–B *(3x16 = 48 Marks)*

2. a) Discuss the following three classifications of quality costs:
      (i) Costs of internal failures
      (ii) Costs of external failures
      (iii) Prevention costs [8]
   b) Explain quality principles [8]

3. a) A regular inspector inspected a certain number of items in a lot and discovered 40 defective. Subsequently, a check inspector reexamined all the items (i.e., good plus defective) and found three items without defects rejected by the regular inspector and four defective items missed by the regular inspector. Calculate the percent of defects correctly found by the regular inspector. [8]
   b) Describe a quality control chart and how it can be used. What are the upper and lower control limits? What does it mean if an observation falls outside the control limits? [8]

4. a) Describe the process of acceptance sampling. What types of sampling plans are there? What is acceptance sampling used for? [8]
   b) For the following data choose suitable single and double sampling plans: N=900, LTPD=5.0%, β=0.1, process average = 0.75%. Explain working of both the plans. [8]

5. a) What is Total Quality Management? What are the approaches in TQM? [8]
   b) Explain need and importance of statistical tolerance analysis. [8]

6. a) Discuss about Weibull distribution and its applications in reliability analysis. [8]
   b) Following table shows the results of life tests carried out on 100 components simultaneously.

Operating time (hours)	0	10	20	30	40	50	60	70	80	90	100
No. of surviving components	100	90	81	73	66	60	55	50	45	41	37

Calculate hazard rate, failure density function and reliability. Also, plot these functions to scale against time. [8]

7. a) Distinguish the terms Reliability Management and Reliability Engineering. [8]
   b) List out various costs associated with reliability improvement. Explain them with examples. [8]

Code No: **RT42044A** **R13** **Set No. 1**

IV B.Tech II Semester Regular/Supplementary Examinations, April - 2018

WIRELESS SENSORS AND NETWORKS

(Common to Electronics and Communications Engineering, Electronics and Instrumentation Engineering & Electronics and Computer Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any THREE questions from Part-B
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PART–A *(22 Marks)*

1.	a)	Point out the challenges for WSNs.	[3]
	b)	Give the list of the appropriate transceivers for WSNs.	[4]
	c)	What are the design issues of MAC protocol for Ad hoc wireless networks?	[4]
	d)	Briefly explain hierarchical routing protocols.	[3]
	e)	Why does TCP not work well in ad hoc network?	[4]
	f)	Why secure routing protocols are needed?	[4]

PART–B *(3x16 = 48 Marks)*

2.	a)	Explain the energy consumption of sensor nodes.	[8]
	b)	Explain about energy consumption of sensor nodes in detail.	[8]
3.	a)	Discuss about the MANETs.	[8]
	b)	Design a transceiver in wireless sensor network for any one application.	[8]
4.	a)	Explain in detail low duty cycle MAC protocols.	[8]
	b)	Generalize the concepts on important classes of MAC protocol.	[8]
5.	a)	Illustrate the basics of table driven Routing Protocols for WSN.	[8]
	b)	Explain about Power-Aware routing Protocols.	[8]
6.	a)	Explain the classification of transport layer solutions.	[8]
	b)	With any five major reasons, analyze why TCP is exposed to significant throughput degradation in ad hoc networks.	[8]
7.	a)	Explain how the security provisioning in adhoc network differs from that in infrastructure based network.	[8]
	b)	Write notes on State centric program.	[8]

Code No: **RT42044A** **R13** **Set No. 2**

IV B.Tech II Semester Regular/Supplementary Examinations, April - 2018

WIRELESS SENSORS AND NETWORKS

(Common to Electronics and Communications Engineering, Electronics and Instrumentation Engineering & Electronics and Computer Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any THREE questions from Part-B
*****

PART–A *(22 Marks)*

1.	a)	State few characteristic requirements of WSNs.	[4]
	b)	What is the exposed node problem?	[3]
	c)	What are the requirements for wireless MAC protocols?	[4]
	d)	What is the concept of Flooding mechanism?	[4]
	e)	What are the differential transport layer protocols?	[4]
	f)	List the network security requirements.	[3]

PART–B *(3x16 = 48 Marks)*

2.	a)	Explain about single node architecture.	[10]
	b)	Explain the enabling technologies for WSNs.	[6]
3.	a)	Discuss about WANETs.	[8]
	b)	Write in detail the four operational states of transceiver.	[8]
4.	a)	Briefly specify IEEE 802.15.4 MAC protocol and explain whether the MAC protocols of 802.11 & Bluetooth be used for WSN. Justify.	[8]
	b)	Illustrate the basics of contention-based protocol for WSN.	[8]
5.	a)	Illustrate in detail about efficient routing protocols with flooding mechanisms for WSNs.	[8]
	b)	Explain about Hierarchical routing protocols.	[8]
6.	a)	What are the design issues of Transport layer protocol for Ad hoc wireless networks?	[8]
	b)	Explain in detail about transport layer protocols with neat diagram.	[8]
7.	a)	List out and explain how some of the internet properties of the wireless Adhoc networks introduce difficulties while implementing security in routing protocols.	[8]
	b)	Discuss about Node level software Platforms.	[8]

Code No: **RT42044A** **R13** **Set No. 3**

IV B.Tech II Semester Regular/Supplementary Examinations, April - 2018

WIRELESS SENSORS AND NETWORKS

(Common to Electronics and Communications Engineering, Electronics and Instrumentation Engineering & Electronics and Computer Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any THREE questions from Part-B
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PART–A *(22 Marks)*

1.	a)	Generalize the three types of mobility for mobile nodes.	[4]
	b)	What are the responsibilities of physical layer?	[4]
	c)	What is inbound neighbor?	[3]
	d)	Examine the differences between table driven or proactive routing protocols.	[4]
	e)	List the issues and challenges in security provisioning of transport layer.	[4]
	f)	How is secure routing done on wireless channels?	[3]

PART–B *(3x16 = 48 Marks)*

2.	a)	Discuss the advantages and applications of sensor networks.	[8]
	b)	Explain how the sensor networks are deployed for various applications.	[8]
3.	a)	Explain the physical layer and transceiver design considerations in wireless networks.	[8]
	b)	Compare MANET and WSN.	[8]
4.	a)	What are the requirements and design constraints for wireless MAC protocols.	[8]
	b)	Explain about MAC protocols that use directional antennas.	[8]
5.	a)	What are the different classes of Routing Protocols?	[8]
	b)	Explain about power-aware routing protocols.	[8]
6.	a)	What are the Classification of Transport layer Protocols?	[8]
	b)	Why does TCP not perform well in adhoc wireless network? Explain.	[8]
7.	a)	What are the design issues and challenges in security provisioning?	[8]
	b)	Write short notes on Wireless Fidelity systems of WSN.	[8]

Code No: **RT42044A** **R13** **Set No. 4**

IV B.Tech II Semester Regular/Supplementary Examinations, April - 2018

WIRELESS SENSORS AND NETWORKS

(Common to Electronics and Communications Engineering, Electronics and Instrumentation Engineering & Electronics and Computer Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any THREE questions from Part-B
*****

PART–A *(22 Marks)*

1. a) What are the difference between sensor network and MANET? [4]
   b) What is a communication protocol for physical layer? [4]
   c) Differentiate between contention based MAC protocol and schedule based MAC protocol. [4]
   d) What are salient features of on demand protocols routing? [4]
   e) Name the four aspects of security. [3]
   f) What do you mean by active and passive attacks? [3]

PART–B *(3x16 = 48 Marks)*

2. a) Explain the various challenges and of potential applications of wireless sensor Networks. [10]
   b) Define the types of Sensors. [6]

3. a) Discuss the main responsibilities of physical layer. Explain about the design parameters of physical layer. [8]
   b) Explain about topologies of PANs. [8]

4. a) Design the approaches and performance of S-MAC protocol. [8]
   b) Explain about MAC Protocols that use directional Antennas. [8]

5. a) What are the design issues of Routing protocol for Ad hoc wireless networks? [8]
   b) Illustrate the basics of proactive routing protocol for WSN. [8]

6. a) Explain the differences of TCP over Ad hoc wireless networks. [8]
   b) Explain ad hoc TCP states and event action mapping in detail. [8]

7. a) Explain various network and application layer security attacks in detail. [8]
   b) Write notes on Implementation procedure of node level simulators. [8]