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Question Paper Code: BST301



INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)

MOOC for M.Tech I Semester Regular Examinations, February – 2017

Regulation: R16

MATERIAL SCIENCE
(Structural Engineering)

Time: 3 Hours

Max Marks: 70

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

UNIT – I

1. (a) Explain solid state diffusion. [8M]
(b) Give a short notes on Crystallography. [6M]
2. (a) Write a detail note on Electron microscope. [7M]
(b) Explain Arrhenius relationship and the equation with the help of a graph. [7M]

UNIT – II

3. (a) Explain plastic deformation by dislocation motion [9M]
(b) Write a short notes on stiffness. [5M]
4. (a) Explain the stress strain curve with the help of tensile test. [6M]
(b) Write a short note on edge dislocation of crystal. [8M]

UNIT – III

5. (a) Explain in detail about creep curve. [7M]
(b) What are the applications of fcc and hcp alloys. [7M]
6. (a) Explain in detail on theory of activation energy. [6M]
(b) Explain dislocation climb in detail. [8M]

UNIT – IV

7. (a) Define Fatigue in Detail. [7M]
(b) Explain terms [7M]
 - i. Fatigue
 - ii. Fatigue strength..
8. (a) Write about the concept of critical flaws. [7M]
(b) What is a critical flaw size in detail. [7M]

UNIT – V

9. (a) What is an eutectic and eutectoid reaction and the eutectic point explain it in detail and their application in steel industry. [8M]
- (b) Write a detail note on intrinsic semi-conductor. [6M]
10. (a) Write a detail note diffusional and diffusionless transformation. [6M]
- (b) Explain the lead tin phase diagram. [8M]

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Question Paper Code: BPE301



INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)

MOOC for M.Tech I Semester Regular Examinations, February – 2017

Regulation: R16

CONVERTER CIRCUITS
(Power Electronics and Electric Drives)

Time: 3 Hours

Max Marks: 70

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

UNIT – I

1. (a) Write the advantages and applications of power semiconductor switches. [7M]
(b) Explain the operation of four quadrant bidirectional switches. [7M]
2. (a) Describe the operation of synchronous rectifier with neat diagrams. [7M]
(b) Write the comparison between IGBT and MOSFET. [7M]

UNIT – II

3. (a) Explain different MOSFET gate driver circuits. [7M]
(b) Discuss the operation of buck-boost converter with neat diagrams. [7M]
4. (a) Describe the switching devices in power semiconductor drives. [7M]
(b) Explain MOSFET characteristics in depletion mode with neat diagrams. [7M]

UNIT – III

5. (a) Describe the current bidirectional two quadrant switches. [7M]
(b) Explain the working of 3 - ϕ full controlled bridge rectifier for RL load in continuous mode. [7M]
6. (a) Explain the switching losses in converters during discontinuous mode of operation with neat diagrams. [7M]
(b) Describe the realization of switch using MOSFETs [7M]

UNIT – IV

7. (a) Describe the 3 - ϕ half bridge inverter with R load [7M]
(b) Write the causes of discontinues conduction mode. [7M]
8. (a) Explain different modes in dual converter? [7M]
(b) Explain the working of 1 - ϕ full controlled bridge rectifier for R load. [7M]

UNIT – V

9. (a) Explain the inverter which gives three level line-line voltage with neat circuit and wave forms. [7M]
- (b) Explain the operation of type-A chopper and derive I_o minimum and I_o maximum. [7M]
10. (a) Discuss the operation the forward converter with neat diagrams. [7M]
- (b) Discuss the operation of step up chopper with neat diagrams. [7M]

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Question Paper Code: BES301



INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)

MOOC for M.Tech I Semester Regular Examinations, February – 2017

Regulation: R16

INTERNET OF THINGS AND EMBEDDED SYSTEMS
(Embedded Systems)

Time: 3 Hours

Max Marks: 70

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

UNIT – I

1. (a) List the benefits of Internet of things along with the design process of IOT? [7M]
(b) Discuss the Applications of IOT? Explain the importance of sensors in IOT applications? [7M]
2. (a) Define ISR? Describe why interrupt service routine is important in any embedded application? [7M]
(b) Explain the generic architecture and implementation of complex embedded systems? [7M]

UNIT – II

3. (a) Summarize the different layered architecture of embedded networks in Internet of things? [7M]
(b) Describe the opportunities and open problems faced while developing embedded system using IOT devices? [7M]
4. (a) Define RTOS and Explain why RTOS is a friendly operating system for internet of things? [7M]
(b) Categorize embedded software profiling techniques based on software and hardware of internet of things? [7M]

UNIT – III

5. (a) Analyze various security considerations and issues while developing device drivers for embedded systems? [7M]
(b) Give the importance of Ethernet in developing embedded systems? What is the minimum and maximum size of an Ethernet frame? [7M]
6. (a) Explain the Rebirth of IT Infrastructure for “IoT”? [7M]
(b) Classify various types of real time operating systems along with the scheduling algorithms present in RTOS? [7M]

UNIT – IV

7. (a) Discuss the future developments in emulation and prototyping and draw the different design flow integrations for emulation of Xilinx interconnection structure? [7M]

- (b) Design a neat block diagram of a RISC and CISC architecture with a hardwired control block and micro programmed control block respectively? [7M]
- 8. (a) Sketch the block diagram of 8051 microcontroller and explain the clock circuit and performance of clock in 8051 microcontroller? [7M]
- (b) Design and discuss in detail the software architecture of intruder alarm system with a neat sketch? [7M]

UNIT – V

- 9. (a) Explain the architecture of CC26XX wireless MCU by using simple link? [7M]
- (b) Describe in detail the major security goals of IOT to ensure proper identity authentication mechanics? [7M]
- 10. (a) Elaborate the Bluemix and cloud importance in IOT with neat sketch diagrams? [7M]
- (b) Define task, semaphores and scheduling in Vx works? Explain interrupts and interrupt handling mechanisms in Vx works? [7M]

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INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)

MOOC for M.Tech I Semester Regular Examinations, February – 2017

Regulation: R16

ADVANCED R PROGRAMMING
(Computer Science and Engineering)

Time: 3 Hours

Max Marks: 70

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

UNIT – I

1. (a) Describe the R IDE components individually. Specify the R features. [7M]
(b) Describe the different data types in R with example. [7M]
2. (a) Write R script to choose the data dynamically from disc, web and assign to a suitable R object and view the data. [7M]
(b) Compare the different of data objects available in R. [7M]

UNIT – II

3. (a) State the apply() function to find the mean of the given vector. [7M]
(b) Write R script to create a array using binding functions in R. [7M]
4. (a) Compare Data frame and list in R. [7M]
(b) Write a R script, to define count() function for counting elements in the given vector. [7M]

UNIT – III

5. (a) Write a R script to create a matrix object and functions to add, subtract and multiply functions in R. List the multiple ways to create a matrix. [7M]
(b) What are the inbuilt R functions used for adding two datasets. [7M]
6. (a) Write a R program to check whether a number is prime or not. [7M]
(b) What is the use of str()function in R? Give Example. [7M]

UNIT – IV

7. (a) In R programming, how missing values are represented and get the summary of missing content in the given dataset? [7M]
(b) What is the use aggregate() function in R? [7M]
8. (a) What is the difference between seq(4) and 1:4? [7M]
(b) Explain how data is aggregated in R by condition? [7M]

UNIT – V

9. (a) How many ways to create new objects in R programming? [7M]
- (b) What are the functions used for merging of data frames horizontally and vertically in R? [7M]
10. (a) Write R script to subtotal the data based on class attribute. [7M]
- (b) Write a R script to create a dataframe and find the sum of second row elements in the given data frame. [7M]

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Question Paper Code: BCC301



INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)

MOOC for M.Tech I Semester Regular Examinations, February – 2017

Regulation: R16

**101D PCT INTRODUCTION TO THE PATENT COOPERATION TREATY AND
IP PANORAMA
(CAD/CAM)**

Time: 3 Hours

Max Marks: 70

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

UNIT – I

1. (a) Express your views about the Intellectual Property Rights necessity for the countries? [7M]
(b) Explain about different types of Intellectual property? [7M]
2. (a) Describe why Trade Secrets are necessary? How do they function? [7M]
(b) Explain the functions of INTA, WIPO? [7M]

UNIT – II

3. (a) Explain acquisition of trademark rights? [7M]
(b) Write the procedure for Selecting and evaluating of trademark? [7M]
4. (a) Explain trademark registration processes? [7M]
(b) Discuss the method of protecting the prior-used trademarks in the system of acquisition-through-registration? [7M]

UNIT – III

5. (a) Explain the fundamental of Copyright Law? [7M]
(b) Define the originality of material and how it is identified? [7M]
6. (a) Explain the procedure for fill the application and registration of copyright? [7M]
(b) Explain the copyright notice and when it is issued? [7M]

UNIT – IV

7. (a) Patent Cooperation Treaty is a major step towards harmonization of Patent regimes in the World- Analyse the above statement based on the features of PCT. [7M]
(b) Explain the product disparagement in unfair competition? [7M]
8. (a) Summarize the position of patenting of software and business methods with case studies. [7M]
(b) Explain how the infringement of trade dress is involved in trade mark? [7M]

UNIT – V

9. The Issue of Traditional Knowledge and Biodiversity concerns are not adequately addressed in TRIPS agreement- Do you agree or disagree? Discuss your standpoint. [14M]
10. (a) Summarize about trade secret protection and litigations using case studies. [7M]
(b) Explain the liability for misappropriation of trade secrets taken place? [7M]