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Question Paper Code: BCS301



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

MOOC for M.Tech I Semester Supplementary Examinations, July - 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) Summarize the stages in creating R environment. [7M]
(b) Write the features of R programming comparing with other programming languages. [7M]
2. (a) Write R script to choose the data dynamically from local disc file and from standard input device. [7M]
(b) Compare the different forms of data types available in R. [7M]

UNIT – II

3. (a) Discuss the different ways to access different types of data. [8M]
(b) State the apply() to perform sum of all element on vector. [6M]
4. (a) List the ways to create array in R in terms of creation and manipulation of data. [7M]
(b) Write a R script, to define swap() function for swapping of any two variables like two numbers, integers and strings. [7M]

UNIT – III

5. (a) Write a R script to create a matrix object and transpose of matrix in R. [8M]
(b) What are the inbuilt R functions used for combining two datasets. [6M]
6. (a) Write a R program to check whether a number is even or odd. [7M]
(b) What is the use of With ()function in R? Give Example. [7M]

UNIT – IV

7. (a) In R programming, how missing values are identified represented? [7M]
(b) What is the use of subset() and sample() function in R? [7M]
8. (a) What is the difference between seq(4) and seq_along(4)? [7M]
(b) List the summary function in R with suitable example? [7M]

UNIT – V

9. (a) How many ways to create data frame object in R? [7M]
(b) What are the functions used for merging of data frames horizontally and vertically in R? [7M]
10. (a) Write R script to subset the data at different levels. [7M]
(b) Write a function to create a vector and inverse of a vector. [7M]

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Question Paper Code: BPE301



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

MOOC for M.Tech I Semester Supplementary Examinations, July - 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 MOSFET. [7M]
(b) Describe Equivalent Circuit Modeling of Switching loss. [7M]
2. (a) Write comparison between thyristors bridge rectifier and diode bridge rectifier. [7M]
(b) Distinguish between BJT and IGBT. [7M]

UNIT – II

3. (a) Discuss the characteristics of IGBT. [7M]
(b) Explain about boost converter with neat diagrams. [7M]
4. (a) Explain about Cuk boost converter with neat diagrams. [7M]
(b) Discuss the characteristics of MOSFET in enhancement mode. [7M]

UNIT – III

5. (a) Explain the working of 3-Ø half controlled bridge rectifier for RL load discontinuous mode. [7M]
(b) Describe the half bridge inverter with RL load with neat diagrams. [7M]
6. (a) Explain synchronous boost converter with neat diagrams. [7M]
(b) Describe the buck converter operation using synchronous rectifier with neat diagrams. [7M]

UNIT – IV

7. (a) Describe the operation of fly back converter operation. [7M]
(b) Describe the four quadrant chopper with neat diagrams. [7M]
8. (a) Describe the half bridge inverter for R load with neat diagrams. [7M]
(b) Explain the working of 1- Ø half controlled bridge rectifier for R load with neat diagrams. [7M]

UNIT – V

9. (a) Derive the step down chopper V_o , V_{rms} , Efficiency and R_i the effective input resistance. [7M]
(b) Describe the operation of 1 - ϕ full controlled bridge rectifier for RL load in continuous mode. [7M]
10. (a) Discuss the operation of three phase inverter in 180 mode. [7M]
(b) A single phase full wave converter is operated from a 220V, 50Hz, supply. If the load is $R=60\Omega$ and $\alpha = \frac{\pi}{2}$ determine peak inverse voltage of thyristors. [7M]

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Question Paper Code: BST301



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

MOOC for M.Tech I Semester Supplementary 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) Give the relationship of elastic deformation to the stretching of atomic bonds. [6M]
(b) Define what do you mean by “structure leads to properties” explain in detail. [8M]
2. (a) How point defects facilitate solid state diffusion and also state the fick’s law. [5M]
(b) How do you find the number of vacancies in a crystal with the help of arrehiniusrelationship in a step by step process. [9M]

UNIT – II

3. (a) Write a short note on the big 4 properties which could be analyzed with the help of a graph produced from tensile test. [8M]
(b) Explain the implementation of a high stress process for the creation of a plastic deformation of a perfect crystal? [6M]
4. (a) Write a short note on edge dislocation of crystal. [10M]
(b) Find out the modulus of elasticity of a steel rod with the help of a stress strain curve. [4M]

UNIT – III

5. (a) Write in detail on the theory of activation energy. [7M]
(b) What are the applications of fcc and hcp alloys. [7M]
6. (a) How arrihenus relationship contribution to creep explain it with the help of arrihenius plot. [8M]
(b) What is a charpy tester why it is used and hoits used for testing of a engineering material. [6M]

UNIT – IV

7. (a) What is the difference b/w a good fracture and bad fracture in fractured toughness with their practical application. [8M]
(b) What is a critical flaw explain it in detail. [6M]

8. (a) Compare the tensile strength curve with fatigue strength curve and list out the major differences with reasons for it. [8M]
(b) Define fatigue in detail. [6M]

UNIT – V

9. (a) Explain the lead tin phase diagram. [6M]
(b) Draw A TTT relation diagram for a eutectoid steel. [8M]
10. (a) What is an eutectic and eutectoid reaction and the eutectic point explain it in detail and their application in steel industry. [8M]
(b) Explain the tin-bismuth experiment with the help of a phase diagram. [6M]

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