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R-17

Code: 7G121

I B.Tech. II Semester Supplementary Examinations February 2022

Data Structures

(Common to All Branches)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

Marks

UNIT-I

- 1. a) Using pointers write a C program which finds the maximum among the list of elements. 10M
- b) Write a C program to swap two numbers using pointers. 4M

OR

- 2. a) What is a pointer? What are the features of pointers? Write a C program to print address of a variable 7M
- b) Explain dynamic memory allocation functions in C in detail. 7M

UNIT-II

- 3. a) Write a C Program to sort the given array in descending order using Bubble Sort. 7M
- b) Write a C program to find the given element using linear searching. 7M

OR

- 4. a) Define Structures. Explain with an example how structure members are initialized and accessed 7M
- b) Write a C program to copy the contents from one file to another file. 7M

UNIT-III

- 5. What is a stack? How it can be represented in "C" using arrays? 14M

OR

- 6. a) What is Data Structure? Explain in detail about different type of data structures. 7M
- b) Write the steps for evaluating postfix expression 7M

UNIT-IV

- 7. What is a Doubly Linked List.? Explain different operations of a Doubly linked list with suitable examples. 14M

OR

- 8. Write a C program to implement the following operations on a singly Linked List
i) Insert at beginning ii) deletion at end iii) Traversing a List 14M

UNIT-V

- 9. a) Define and describe the terms: Tree, Binary Tree, Complete Binary Tree and Degree of a tree. 7M
- b) Draw a complete undirected graph having five nodes. 7M

OR

- 10. Construct Binary search tree for the following elements: 67, 12, 45, 98, 80, 73, 7, 120, 85, 30, 42 then Delete 73, 67, 12, 98. 14M

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R-17

Code: 7GC24

I B.Tech. II Semester Supplementary Examinations February 2022

Engineering Mathematics-II

(Common to All Branches)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

Marks

UNIT-I

1. a) Trace the curve $a y^2 = x^2 (a^2 - x^2)$ 7M

b) Change the order of integration in $\int_0^1 \int_0^{\sqrt{1-x^2}} y^2 dy dx$ and hence evaluate. 7M

OR

2. a) Trace the curve $y^2 (x - a) = x^2 (x + a)$ 14M

UNIT-II

3. a) Find the Laplace Transform of $t e^{-t} \sin t$ 7M

b) Find the Laplace Transform of $\cosh^2 2t$ 7M

OR

4. a) Find the Laplace Transform of $\int_0^t \frac{\sin t}{t} dt$. 7M

b) Evaluate $\int_0^{\infty} t e^{-2t} \cos t dt$ 7M

UNIT-III

5. a) Find the inverse transform of $\frac{s + 2}{s^2 - 4s + 13}$. 7M

b) Find the inverse transform of $\frac{s^2 - 3s + 4}{s^3}$. 7M

OR

6. Find $L^{-1} \left\{ \frac{2s^2 - 6s + 5}{s^3 - 6s^2 + 11s - 6} \right\}$ 14M

UNIT-IV

7. a) Find the angle between the surface $x^2 + y^2 + z^2 = 12$ and $x^2 + y^2 - z = 12$ at the point $(2, 2, 2)$ 7M
- b) Show that $\nabla^2\left(\frac{1}{r}\right) = 0$ 7M

OR

8. a) Show that $\text{div}(\text{grad } r^n) = n(n+1)r^{n-2}$ 7M
- b) Prove that $\text{div curl } \vec{F} = 0$ 7M

UNIT-V

9. Verify stoke's theorem for a vector field $\vec{F} = (x^2 + y^2)\vec{i} - 2xy\vec{j}$ taken round the rectangle bounded by the lines $x = \pm a$, $y = 0$, $y = b$. 14M
- OR**
10. Verify Divergence thermo for $\vec{F} = (x^2 - yz)\vec{i} + (y^2 - zx)\vec{j} + (z^2 - xy)\vec{k}$ taken over the rectangular parallelepiped $0 \leq x \leq a$, $0 \leq y \leq b$, $0 \leq z \leq c$ 14M

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R-17

Code: 7GC23

I B.Tech. II Semester Supplementary Examinations February 2022

Engineering Physics

(Common to CE, ME and CSE)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

	Marks
UNIT-I	
1. a) Describe construction of optical fiber	6M
b) Write the application of optical fiber in communication system	8M
OR	
2. a) Illustrate the procedure for finding Acceptance Angle and Numerical Aperture of Optical fiber	10M
b) Distinguish Interference and Diffraction of light	4M
UNIT-II	
3. a) Show that FCC is closely packed than SC and BCC structures	10M
b) Draw the plane of miller indices of (111) and (121)	4M
OR	
4. a) Define ultrasonics and write its properties	6M
b) Describe the production of ultrasonics by Inverse Peizo electric effect	8M
UNIT-III	
5. a) Explain postulates of free electron model	6M
b) How the solids are classified on the basis of energy band theory	8M
OR	
6. a) Define conductivity and drive its equation for metals	8M
b) Distinguish metals, semiconductors and insulators	6M
UNIT-IV	
7. a) Explain Hall effect and write its applications	10M
b) What is photo diode explain it	4M
OR	
8. a) Explain the diamagnetic nature of superconductors by Meissner's effect	8M
b) Mention the applications of superconductors	6M
UNIT-V	
9. a) Explain Hysterisis loop of ferromagnet	6M
b) Derive magnetic moment of magnetic material through origin	8M
OR	
10. a) Narrate the importance of nano materials by basic principles	6M
b) justify the importance of chemical vapour deposition technique by the synthesis of nano materials	8M

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R-17

Code: 7GC21

I B.Tech. II Semester Supplementary Examinations February 2022

Environmental Science

(Computer Science and Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

Marks

UNIT-I

- 1. a) Enumerate four conceptual spheres in the earth's environment. 7M
- b) Explain briefly the importance of environmental studies. 7M

OR

- 2. a) How would environmental awareness help to protect our environment? 7M
- b) List out different disciplines involved with environment. Explain? 7M

UNIT-II

- 3. a) Summarize the effects of dams on forest and tribal people. 7M
- b) How can you as an individual conserve different natural resources? 7M

OR

- 4. Give a detailed account on floods. 14M

UNIT-III

- 5. a) Discuss the salient features of a lake ecosystem. 7M
- b) With a neat sketch, explain how the element carbon is recycled in nature. 7M

OR

- 6. a) List the environmental services offered by biodiversity. 7M
- b) Differentiate between in-situ and ex-situ conservation of biodiversity? Give examples. 7M

UNIT-IV

- 7. a) Bring out the main elements of water pollution. 7M
- b) Enumerate the various methods for control of marine pollution. 7M

OR

- 8. a) Discuss adverse effects of soil pollution. 7M
- b) Briefly describe causes, effects and control measures of thermal pollution. 7M

UNIT-V

- 9. a) What is global warming? Enlist its consequences. 7M
- b) Mention two important environmental laws. 7M

OR

- 10. a) What do you mean by population explosion? What are its effects on environment and other human aspects? 7M
- b) Value education has an important effect on environmental conservation. Justify. 7M

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Code: 7G221

I B.Tech. II Semester Supplementary Examinations February 2022

Basic Electrical and Electronics Engineering

(Computer Science and Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

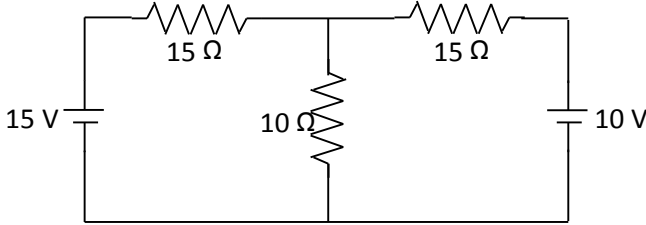
Marks

UNIT-I

- 1. a) How the Network elements can be classified. Explain it clearly with a suitable example. 7M
- b) Three resistances of 8 , 9 & 10 are connected in delta determine the resistances for an equivalent star connection. 7M

OR

- 2. a) A circuit consists of two resistors 20 ohm and 30 ohm connected in parallel. They are connected in series with a resistor of 15 ohm. If the current through the 15 ohm resistor is 3 A, find the current in the other resistors and supply voltage? 7M
- b) Find the current through 10 resistance in the below circuit.



7M

UNIT-II

- 3. a) Elaborate about Brake test on dc machine. 7M
- b) A 220V DC shunt motor takes a total current of 100A & runs at 900rpm. The resistance of the armature winding and shunt field winding is 0.1 and 40 respectively. Find the torque developed by armature. 7M

OR

- 4. Explain classification of a DC Motors along with suitable diagrams and voltage and current relationship. 14M

UNIT-III

- 5. a) Explain Torque-Slip Characteristics of a Three phase induction motor. 7M
- b) Explain the working principle of three phase alternator. 7M

OR

- 6. a) Describe the production of RMF in three phase induction motor. 7M
- b) A 3- induction motor runs at 1300 rpm at no load and 1140 rpm at full load when supplied with power from a 50Hz, 3 phase line. Calculate number of poles and slip at full load. 7M

UNIT-IV

- 7. Explain the operation of Full wave rectifier with relevant diagrams. 14M

OR

- 8. a) Explain the operation of P-N junction diode mentioning its applications. 7M
- b) Explain in detail about frequency response of CE amplifier. 7M

UNIT-V

- 9. Explain the principle of CRT with a neat sketch. 14M

OR

- 10. Explain the Block diagram of CRO with a neat sketch. 14M
