

Code: 7G221

I B.Tech. II Semester Supplementary Examinations March 2021

Basic Electrical and Electronics Engineering

(Computer Science and Engineering)

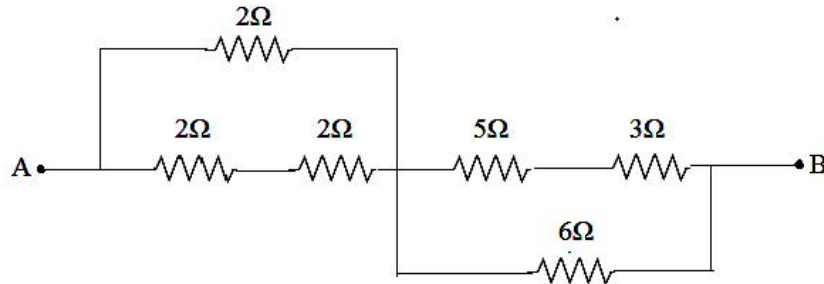
Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 14 = 70 Marks)

UNIT-I

1. Find the equivalent resistance between A & B terminals.

**OR**

2. a) Derive the expression for star to delta transformation.
 b) Two resistors of each 7 Ω and 9 Ω are connected in parallel across a 10V DC supply. Find the current through each resistor by current division technique.

UNIT-II

3. a) Derive the emf equation of DC generator.
 b) A 4-pole, lap wound, DC generator has a useful flux of 0.07Wb per pole, armature consists of 440 numbers of conductors. Calculate the generated emf when it is rotated at a speed of 1500 rpm with the help of prime mover.

OR

4. Discuss the functions of following parts in a D.C Generator
 (i) Yoke (ii) Commutator (iii) Brushes.

UNIT-III

5. A 2500/250 V, 25 KVA transformer has a core losses of 150W & full load copper losses of 350W. Calculate the efficiency of full load when it is operating at 0.9 PF lagging?

OR

6. Explain the principle operation of a three phase induction motor with relevant diagrams.

UNIT-IV

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

OR

8. Explain the operation of Bridge rectifier with relevant diagrams.

UNIT-V

9. Explain the principle of CRT with a neat sketch.

OR

10. Enumerate the applications of dielectric heating and induction heating.

Hall Ticket Number :																				
----------------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

R-17

Code: 7G121

I B.Tech. II Semester Supplementary Examinations March 2021

Data Structures

(Common to All Branches)

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 14 = 70 Marks)

UNIT-I

- 1. a) Write a C program to access elements of an array using pointer.
- b) Explain the concept of pointers to pointers.

OR

- 2. a) Define pointer and explain about pointer arithmetic.
- b) List the four dynamic memory allocation functions in C and give their syntax with examples.

UNIT-II

- 3. a) Explain with an example about nested structures.
- b) Explain any four standard library functions for files in C.

OR

- 4. a) Give the tracing of selection sort algorithm for the data [5, 1, 7, 8, 2, 3, 4, 6] to be sorted in ascending order.
- b) Differentiate between structure and union.

UNIT-III

- 5. a) Write a C program to implement operations of a dynamic queue.(Use pointers)
- b) Write a program to implement stack operations using pointers.

OR

- 6. Convert the following infix expressions to postfix expressions.
i) $A / B * C - D$ ii) $(A - B) * (C * D)$ iii) $A + B + C * D$

UNIT-IV

- 7. a) Explain the advantages and disadvantages of linked lists over arrays.
- b) Write the applications of circular linked list.

OR

- 8. a) Write a C program for insertion operation in a singly linked list.
- b) Write C functions for deletion operations in doubly linked list.

UNIT-V

- 9. a) Define the following terms of a graph.
 i) Undirected graph ii) In degree iii) Digraph
- b) Explain different types of traversals in a tree.

OR

- 10. Create a binary search tree by inserting following elements into an empty BST: [6, 4, 5, 3, 10, 8, 11].

Code: 7GC24

I B.Tech. II Semester Supplementary Examinations March 2021

Engineering Mathematics-II

(Common to All Branches)

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 14 = 70 Marks)

UNIT-I

1. a) Trace the curve $y^2(2a-x) = x^2$.
 b) Evaluate the double integral $\iint_R xy \, dx \, dy$ where 'R' is the region bounded by the lines x -axis, the line $y = 2x$ and $y = \frac{x}{4a}$

OR

2. a) Trace the curve $ay^2 = x^2(a^2 - x^2)$
 b) Change the order of integration in $\int_0^1 \int_0^{\sqrt{1-x^2}} y^2 \, dy \, dx$ and hence evaluate.

UNIT-II

3. a) Find the Laplace Transform of $t^2 e^{-3t}$.
 b) Find the Laplace Transform of $\frac{\sin 3t \cos t}{t}$

OR

4. Find the Laplace Transform of the periodic function defined by the triangular wave

$$f(t) = \begin{cases} \frac{t}{a} & ; 0 \leq t \leq a \\ \frac{2a-t}{a} & ; a \leq t \leq 2a \end{cases} \quad \text{and } f(t+2a) = f(t)$$

UNIT-III

5. a) Find the inverse transform of $\frac{s^2 - 3s + 4}{s^3}$.
 b) Find the inverse transform of $\frac{1}{s(s^2 + a^2)}$.

OR

6. Find the inverse transform of $\log\left(\frac{s+1}{s-1}\right)$.

UNIT-IV

7. a) Find the unit vector normal to the surface $x^3 + y^3 + 3xyz = 3$ at the point (1, 2, -1)
 b) Prove that $\text{div curl } \vec{F} = 0$

OR

8. 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)

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 $x = \pm a$, $y = 0$, $y = b$.

OR

10. Verify Green's Theorem in the plane for $\int_c [(3x^2 - 8y^2)dx + (4y - 6xy)dy]$ where 'c' encloses the region bounded by $y = \sqrt{x}$ and $y = x^2$

Hall Ticket Number :																			
----------------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

R-17

Code: 7GC23

I B.Tech. II Semester Supplementary Examinations March 2021

Engineering Physics
(Common to CE, ME & CSE)

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 14 = 70 Marks)

UNIT-I

1. a) Describe construction of optical fiber
b) Write the application of optical fiber in communication system

OR

2. a) Explain conditions of interference by the reflected light due to thin parallel film
b) Describe the Fraunhofer diffraction grating spectrum

UNIT-II

3. a) Define ultrasonics and write its properties
b) Describe the production of ultrasonics by Inverse Piezo electric effect

OR

4. a) Deduce Bragg's law equation
b) Illustrate the powder method to describe the structure of crystal

UNIT-III

5. a) Describe Fermi-Dirac distribution function
b) Write the sources of electrical resistance

OR

6. Derive Eigen energies of a particle in one dimensional potential box

UNIT-IV

7. a) Explain Hall effect and write its applications
b) What is photo diode explain it

OR

8. a) Explain direct and indirect band gap semiconductors
b) Brief Josephson's effect with types

UNIT-V

9. a) Define ferromagnet and explain the B-H loop
b) Explain the production of nano materials by ball milling method

OR

10. a) Brief the basic principles of nano materials
b) Explain the synthesis of nano materials by sol-gel method

Hall Ticket Number :																			
----------------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

R-17

Code: 7GC21

I B.Tech. II Semester Supplementary Examinations March 2021

Environmental Science

(Computer Science and Engineering)

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 14 = 70 Marks)

UNIT-I

1. a) List and explain the four conceptual spheres in the earth's environment. 7M
b) Summarize the need for public awareness about environment. 7M

OR

2. Explain the scope and importance of environmental studies. 14M

UNIT-II

3. a) What are renewable and nonrenewable natural resources? Give examples. 7M
b) Summarize the causes of deforestation. 7M

OR

4. a) Discuss the importance of land as a natural resource. 7M
b) Explain the various effects of soil erosion. 7M

UNIT-III

5. a) Describe the components of an ecosystem. 7M
b) Explain briefly the ex situ conservation of biodiversity. 7M

OR

6. a) With a neat sketch, explain how the element carbon is recycled in nature. 7M
b) Discuss briefly the in situ conservation of biodiversity. 7M

UNIT-IV

7. a) List and explain the control measures of air pollution. 7M
b) Identify and explain the human activities contributing to large scale water pollution. 7M

OR

8. a) Discuss in detail the control measures of noise pollution. 7M
b) Describe the effects and control measures of water pollution. 7M

UNIT-V

9. a) Describe the causes of population explosion. 7M
b) List the salient features of forest conservation act. 7M

OR

10. a) Summarize the salient features of air (prevention and control of pollution) act. 7M
b) Explain the effects and control of AIDS. 7M
