R-17

Code: 7GC24

I B.Tech. II Semester Supplementary Examinations June 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)

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Marks

UNIT–I

1. Evaluate the double integral $\iint\limits_{R} x\,y\,dx\,dy$ where 'R' is the region bounded by the lines

   $x-axis$, the line $y=2x$ and $y=\dfrac{x}{4a}$

OR

2. Evaluate $\int\limits_{0}^{\infty}\int\limits_{0}^{\infty} e^{-(x^2+y^2)}\,dx\,dy$ by changing to polar coordinates.

UNIT–II

3. a) Find the Laplace Transform of $\dfrac{\cos at-\cos bt}{t}$

   b) Find the Laplace Transform of $t^2 e^{-3t}$.

OR

4. a) Find the Laplace Transform of sin2t sin3t

   b) Find the Laplace Transform of $\dfrac{\sin 3t \cos t}{t}$

UNIT–III

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

OR

6. Solve the differential equation $y''+y=t,\ y(0)=1,\ y'(0)=2$ Using Laplace Transform

UNIT–IV

7. Find the unit vector normal to the surface $x^3+y^3+3x\,y\,z=3$ at the point $(1,\,2,-1)$

OR

8. Find $div\,\bar{F}$ and $curl\,\bar{F}$ where $\bar{F}=grad\left(x^3+y^3+z^3-3x\,y\,z\right)$

UNIT–V

9. Evaluate by Green's theorem $\int\limits_{c}\left[\left(x^2-\cos hy\right)dx+\left(y+\sin x\right)dy\right]$, where 'c' is the

   rectangle with vertices $(0,0),\,(f,0),\,(f,1),\,(0,1)$.

OR

10. Verify Gauss Divergence theorem for $\bar{F}=x^3\bar{i}+y^3\,\bar{j}+z^3\,\bar{k}$ taken over the cube bounded

    by $x=0,x=a\,;y=0,\ y=a\,;z=0,z=a$

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Hall Ticket Number :

I B.Tech. II Semester Supplementary Examinations June 2022

Engineering Physics

(Common to CE, ME & CSE)

Max. Marks: 70   Time: 3 Hours

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

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UNIT–I

1.   Explain the process of induced absorption, spontaneous emission and stimulated emission. Obtain an expression for energy density of radiation under equilibrium conditions in terms of Einstein A & B Coefficients.

OR

2.   Explain the construction and working of semiconductor laser

UNIT–II

3. a)   What is space lattice? Describe briefly the seven systems of crystals

   b)   Explain the various detection methods for ultrasonics.

OR

4.   Derive Bragg's law for X-ray diffracton

UNIT–III

5.   Mention the assumptions of classical free electron theory. Based on classical free electron theory derive the expression for electrical conductivity of a metal.

OR

6.   Explain the salient features of quantum free electron theory.

UNIT–IV

7.   Describe with suitable diagrams the construction and action of a P-N junction diode

OR

8. a)   Discuss Maglev vehicles and SQUIDS.

   b)   What is Meissner effect? Discuss type I and type II superconductor with examples.

UNIT–V

9. a)   Explain in detail any two applications of nanotechnology

   b)   Discuss the applications of hard and soft magnets

OR

10. a)   What are ferromagnetic materials? Discuss the hysteresis of a ferromagnetic material

   b)   Explain the synthesis of nanomaterials using chemical vapour deposition.

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R-17

Code: 7GC21

I B.Tech. II Semester Supplementary Examinations June 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)

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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. a) Discuss the salient features of environment.   7M
    b) Outline the major causes for environmental degradation.   7M

UNIT–II

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

OR

4. a) Discuss the problems associated with the over exploitation of natural resources. 7M
    b) Define soil erosion. How can it be checked?   7M

UNIT–III

5.   Identify and explain the major threats to the biodiversity.   14M

OR

6. a) Discuss the importance of protecting the biodiversity of earth.   7M
    b) Define biodiversity and explain its types.   7M

UNIT–IV

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

OR

8. a) Explain the effects of nuclear and radiation pollution.   7M
    b) Differentiate between pollution prevention and pollution control.   7M

UNIT–V

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

OR

10. a) Explain the effects of ozone layer depletion.   7M
    b) Briefly describe the environmental ethics.   7M

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I B.Tech. II Semester Supplementary Examinations June 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)
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Marks

UNIT–I

1. a) State and Explain ohms law and list out its applications & limitations.
   b) How the network elements can be classified. Explain it clearly with a suitable example.

OR

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

UNIT–II

3. a) Derive emf equation of DC Generator.
   b) A 4-pole DC generator has 378 conductors in its armature. If the flux per pole is 20mwb and the generator runs at 1000rpm. Calculate the induced emf, if winding is connected in i)Lap winding ii) Wave winding.

OR

4. a) Discuss the functions of the following part in a D.C.Generator
      i)Yoke ii)Commutator iii) Brushes.
   b) Derive the expression for Torque developed in the armature of a D.C. motor. State the factor on which the Torque depends.

UNIT–III

5. a) Derive the expression for E.M.F equation of a transformer.
   b) Explain brake test on three phase induction motor.

OR

6. Define the regulation of an alternator and explain how you will find the regulation by synchronous impedance method.

UNIT–IV

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

OR

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

UNIT–V

9. a) Explain the principle & theory of induction heating with necessary diagrams and list out the industrial application of induction heating.

OR

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

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Code: 7G121

I B.Tech. II Semester Supplementary Examinations June 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)

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Marks

UNIT–I

1. a) Define pointer? How pointer variables are initialized.
   b) Write a c program to access elements of an array using pointers.

OR

2. a) Write a short note on void pointer.
   b) Discuss about any two dynamic memory allocation functions.

UNIT–II

3. a) Differentiate structures and unions.
   b) Explain any one sorting technique with example program.

OR

4. a) List and explain any four functions related to file handling in c.
   b) Differentiate linear search and binary search.

UNIT–III

5. What is Queue? Explain the operations of a Queue with an example program.

OR

6. a) Convert the following infix expression to post fix expressions
      i)   A + B * C +D   ii) (A + B) * (C+D)
   b) What is stack? Write the applications of stack.

UNIT–IV

7. Discuss the operations of a single linked list with proper diagrams.

OR

8. How to represent doubly linked list? Write the algorithm to insert and delete operations in double linked list.

UNIT–V

9. What is Binary Search Tree? Construct the BST for the nodes 15, 6, 3, 7, 45, 50

OR

10. What is Di-graph? Explain different representation of graphs.

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