

Hall Ticket Number :

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R-17

Code: 7GC21

I B.Tech. II Semester Regular & Supplementary Examinations May/June 2019

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) Define Environment Literacy. What are the major objectives of environment education? 7M
- b) Highlight the major environmental Issues in India. 7M

OR

2. a) Mention the names of any seven world famous eminent environmentalists. 7M
- b) Awareness in public promotes protection of environment. Justify. 7M

UNIT-II

3. a) Enumerate the ecological benefits of forests. 7M
- b) Discuss with an example the major arguments against the construction of dams. 7M

OR

4. a) "Water could be the source of the world's next big conflicts". Explain. 7M
- b) Suggest the possible contributions of individuals towards energy conservation. 7M

UNIT-III

5. a) Write a note on the components of the ecosystem. 7M
- b) With a neat sketch explain how the element carbon is recycled in nature and discuss its role in global warming. 7M

OR

6. a) Define biodiversity and explain various types of biodiversity with examples. 7M
- b) Briefly explain the importance of protecting the biodiversity of earth. 7M

UNIT-IV

7. a) Write short notes on:
i. Bio-magnification. ii. Bioaccumulation. 7M
- b) What are the steps needed for the abatement of marine pollution? 7M

OR

8. a) How does soil pollution affect crop productivity? What measures can be taken to prevent soil pollution? 7M
- b) Describe the impacts of noise on human health. 7M

UNIT-V

9. a) Explain the possible impacts of ozone depletion on the ecosystem. 7M
- b) Write short notes on:
i. Water (Prevention and control of pollution) Act.
ii. Environment protection Act 7M

OR

10. a) Explain the necessity of value education. 7M
- b) What are the preventive measures to be taken for HIV/AIDS? 7M

Code: 7G221

I B.Tech. II Semester Regular & Supplementary Examinations May/June 2019

Basic Electrical and Electronics Engineering

(Computer Science and Engineering)

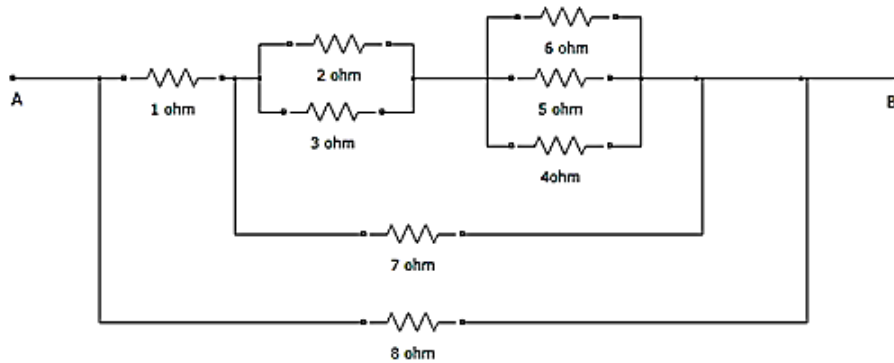
Max. Marks: 70

Time: 3 Hours

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

UNIT-I

1. a) State KCL and KVL. 4M
 b) Calculate the equivalent Resistance between terminals a and b for the below circuit.



10M

OR

2. a) Derive the expression for the equivalent inductance of series combination of Three inductances with 3mH each. 4M
 b) Find the total current passed through the circuit consisting of three resistors connected in parallel across the supply of 20 V. Where $R_1=10\Omega$, $R_2=5\Omega$, $R_3=12\Omega$. Also find the current passed through individual resistances R_1, R_2 and R_3 . 10M

UNIT-II

3. a) Derive the EMF equation of DC generator. 7M
 b) A 220v DC shunt motor running with 800 rpm has no load armature current of 5A field current is 1A and its armature resistance is 0.5Ω . Find (i) constant losses (ii) armature current corresponding to maximum efficiency (iii) maximum efficiency for both motor and generator? 7M

OR

4. a) Draw the constructional diagram of DC machine and explain the main parts. 7M
 b) Explain armature control and field control methods of DC motor. 7M

UNIT-III

5. a) Discuss the Principle of operation of 1 Φ Transformer with constructional diagram. 7M
 b) Derive the EMF equation of single phase transformer. 7M

OR

6. a) Discuss the principle of operation of 3 Φ Induction motor. 5M
 b) Draw the constructional diagram of an Alternator and discuss the principle of operation. 9M

UNIT-IV

7. a) Classify the diodes and draw the V-I characteristics of diode. 7M
 b) Draw the full wave rectifier and discuss the operation of circuit. 7M

OR

8. a) Discuss the operation of PN junction under forward bias condition with its characteristics. 7M
 b) Discuss the input and output characteristics of a transistor in CE configuration. 7M

UNIT-V

9. a) Discuss the principle of operation of dielectric heating with its advantages. 10M
 b) List out the applications of Dielectric heating. 4M

OR

10. a) Draw the block diagram of CRO and discuss the operation. 10M
 b) List out the applications of CRO. 4M

Code: 7G121

I B.Tech. II Semester Regular & Supplementary Examinations May/June 2019

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) What is meant by a pointer? Write a program to swap the values of two variables using pointers. 7M
- b) Write a program to show the usage of pointer to structure. 7M

OR

2. a) Demonstrate the use of &(address of) and *(value at address) operators 7M
- b) Write a program to show a function returning pointer. 7M

UNIT-II

3. a) What is a structure? Explain the syntax of Structure declaration with example 7M
- b) How Selection sort is different from bubble sort? 7M

OR

4. a) Define Union. Explain its general syntax with one example. 7M
- b) Arrange the following integers in ascending order using Merge sort procedure.
39,48,62,18,23,34,58,12. 7M

UNIT-III

5. a) Explain stack with basic Operations (push and pop). 7M
- b) Design the procedure to count number of parenthesis in an expression using Stack. 7M

OR

6. Compare Linear Queue and Circular Queue. Write a program to insert and delete from a circular queue. 14M

UNIT-IV

7. Implement Insertion, Deletion and search operations at any position in a singly linked list. 14M

OR

8. a) Write insertion and deletion functions for the doubly linked list. 7M
- b) Summarize Circular Linked List 7M

UNIT-V

9. a) Construct a Binary tree T by using the following in order and post order traversals of T.
In order: D K I B A E G H J F C
Post Order: K D I E A G B F C J H. 7M
- b) Explain various methods of representing graphs in memory. 7M

OR

10. What is Binary Search Tree (BST)? How do we do search in BST? Write a procedure for insertion and deletion operations on BST. 14M

Code: 7GC24

I B.Tech. II Semester Regular & Supplementary Examinations May/June 2019

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. Trace the curve- Folium of Descartes: $x^3 + y^3 = 3axy$. 14M

OR

2. Evaluate $\int_0^1 \int_x^{\sqrt{x}} xy \, dx dy$ by changing the order of integration. 7M

UNIT-II

3. a) Find the Laplace transform of $e^{3t} t^{\frac{7}{2}}$ 6M

- b) Find the Laplace transform of $\int_0^t \frac{\sin u}{u} du$. 8M

OR

4. Find the Laplace transform of the Half wave rectifier

$$f(t) = \begin{cases} \sin \omega t, & 0 < t < \frac{\pi}{\omega} \\ 0, & \frac{\pi}{\omega} < t < \frac{\pi}{2\omega} \end{cases}$$
14M

UNIT-III

5. Use convolution theorem to evaluate $L^{-1} \left[\frac{s}{(s^2+1)^2} \right]$. 14M

OR

6. Solve the differential equation $y'' + 7y' + 10y = 4e^{-3t}$, $y(0) = 0$, $y'(0) = -1$ using Laplace Transforms. 14M

UNIT-IV

7. a) Prove that $\nabla r^n = nr^{n-2}\bar{r}$. 7M

- b) Find the directional derivative of $f = x^2yz + 4xz^2$ at $(1, -2, -1)$ in the direction of $2\bar{i} - \bar{j} - 2\bar{k}$. 7M

OR

8. Prove that $\bar{A} = (6xy + z^3)\bar{i} + (3x^2 - z)\bar{j} + (3xz^2 - y)\bar{k}$ is irrotational. Find the scalar function $f(x, y, z)$ such that $\bar{A} = \nabla f$. 14M

UNIT-V

9. Verify Gauss divergence theorem for $\bar{f} = (x^3 - yz)\bar{i} - 2x^2y\bar{j} + z\bar{k}$ taken over the surface of the cube bounded by the planes $x=y=z=a$. the coordinate planes. 14M

OR

10. Verify Green's theorem for $\oint_C (xy + y^2)dx + x^2dy$, where C is the closed curve of the region bounded by $y = x$ and $y = x^2$. 14M

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Code: 7GC23

I B.Tech. II Semester Regular and Supplementary Examinations May/June 2019

Engineering Physics
(Common to CE, ME and 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) 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. 8M
- b) In a Newton's rings experiment the diameter of the 15 ring was found to be 0.59cm and that of the 5th ring is 0.336 cm. If the radius of curvature of the lens is 100 cm, find the wave length of the light. 6M

OR

2. a) Explain the construction and working of semiconductor laser 7M
- b) Describe the principle on which optical fiber works and obtain an expression for numerical aperture. 7M

UNIT-II

3. a) What are Miller Indices? Obtain an expression for inter planar spacing in terms of Miller indices 8M
- b) Describe in detail how a flaw in solid material is detected by non destructive method using ultrasonics. 6M

OR

4. a) Define Packing factor. Calculate the packing factor of BCC and FCC 8M
- b) Draw the following planes in a cubic unit cell (0 1 1), (1 0 2) and (1 3 2) 6M

UNIT-III

5. a) State Heisenberg uncertainty principle. Based on the principle, prove that free electrons cannot exist inside the nucleus of an atom 7M
- b) Mention the assumptions of classical free electron theory. Based on classical free electron theory derive the expression for electrical conductivity of a metal. 7M

OR

6. a) Assuming the time independent Schrodinger wave equation in one dimension, discuss the solution of a particle in one dimensional potential well of infinite height. Hence obtain the normalized wave function. 10M
- b) Find the temperature at which there is 1% probability that a state with an energy 0.5eV above Fermi energy is occupied. 4M

UNIT-IV

7. a) What is Hall effect? Obtain an expression for the Hall coefficients. 8M
- b) Discuss Magnetic vehicles and SQUIDS. 6M

OR

8. a) What is Meissner effect? Discuss type I and type II superconductor with examples. 7M
- b) Discuss how Cooper pairs are formed? What is the importance of Cooper pairs in superconductivity? 7M

UNIT-V

9. a) What are ferromagnetic materials? Discuss the hysteresis of a ferromagnetic material 7M
- b) Explain the synthesis of nanomaterials using chemical vapour deposition. 7M

OR

10. a) What are Hard and Soft magnetic materials? Compare them on the basis of hysteresis curves. Give three examples of each type. 8M
- b) What are nano materials? Explain the structure and properties of carbon nanotubes. 6M
