

Hall Ticket Number :

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R-17

Code: 7GC13

I B.Tech. I Semester Supplementary Examinations March 2021

Engineering Physics
(Common to EEE & ECE)

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. What is interference? With a neat diagram, explain that the diameter of bright Newton's Ring is directly proportional to the square root of the odd number. 14M

OR

2. What is optical fiber? Discuss briefly principle, construction and working of an optical fiber. 14M

UNIT-II

3. Show that FCC is most closely packed of the three cubic structures by working out its packing fractions. 14M

OR

4. What is piezoelectric effect? Draw a neat diagram and explain the piezoelectric generator for production of ultrasonic waves? 14M

UNIT-III

5. Obtain the expression for energy levels of a particle of mass m which is free to move in a region of zero potential between two rigid walls of $x=0$ and $x=L$. 14M

OR

6. Explain the behaviour of an electron moving in a field of periodic potential using Kronig and Penny model. 14M

UNIT-IV

7. Explain with a suitable diagram working of Hall effect and its uses. 14M

OR

8. a) Describe with an appropriate diagram working of a P-N junction diode. 7M
b) Elaborate Josephson effects and their applications. 7M

UNIT-V

9. a) Derive an equation for magnetic moment of atom. 7M
b) How optical and mechanical properties of nanomaterials varies with their size. 7M

OR

10. Write a detailed note on nanoscience and nanotechnology. 14M

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Code: 7G311

I B.Tech. I Semester Supplementary Examinations March 2021

Fundamental of Electrical & Electronics Engineering

(Common to EEE & ECE)

Max. Marks: 70

Time: 3 Hours

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

UNIT-I

- Differentiate ideal and practical voltage source.
 - Classify the variable resistors and explain any two of them.

OR

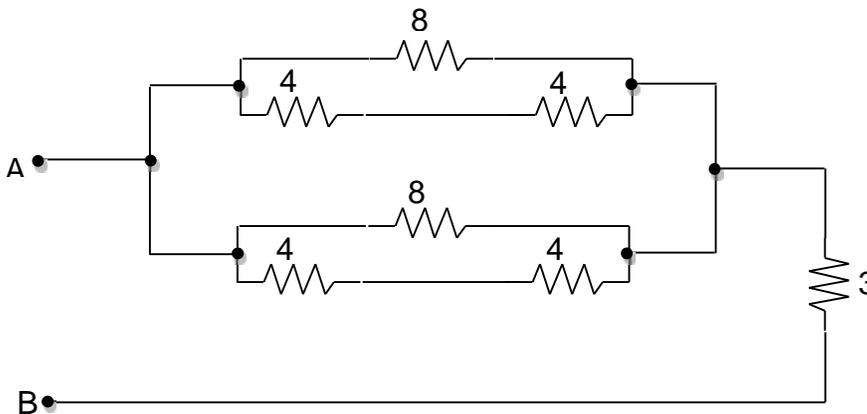
- Find the resistor values for the color codes given below.
 - Brown, Black, Orange
 - Orange, Orange, Red
 - Yellow, Violet, Red
 - Green, Grey, Blue
 - Red, Red, Red

UNIT-II

- State the following
 - Ohms law
 - KVL
 - KCL

OR

- Find the equivalent resistance between A, B terminals for the network given below.

**UNIT-III**

- Write short notes on
 - Avalanche breakdown
 - Zener breakdown
 - Illustrate the function of Zener diode as a voltage regulator.

OR

- Draw and explain piece-wise linear diode characteristics
 - Define the following
 - cut in voltage (V_c)
 - Static resistance
 - Dynamic Resistance

UNIT-IV

- Define the terms as referred to FWR circuit:
 - PIV
 - Average DC voltage
 - RMS Current
 - Ripple factor
 - Explain the circuit diagram of a Bridge rectifier and sketch the input and output waveforms.

OR

- A FWR supplies a load requiring 300V at 200mA. Calculate the transformer secondary voltage for;
 - A capacitor input filter using a capacitor of 10mA.
 - A choke input filter using a choke of 10H and a capacitance of 10mF. Neglect the choke resistance.

UNIT-V

- Draw and explain the input and output characteristics of transistor in CB configuration.
 - Define the following
 - Active region
 - saturation region
 - Cut-off region.

OR

- Explain the operation of CRO with neat diagram.

Code: 7GC14

I B.Tech. I Semester Supplementary Examinations March 2021

Engineering Mathematics-I

(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) Define the rank of the matrix and find the rank of the following matrix

$$\begin{bmatrix} 2 & 1 & 3 & 5 \\ 4 & 2 & 1 & 3 \\ 8 & 4 & 7 & 13 \\ 8 & 4 & -3 & -1 \end{bmatrix}$$

- b) Test for consistency and solve
- $5x+3y+7z=4$
- ,
- $3x+26y+2z=9$
- ,
- $7x+2y+10z=5$

OR

2. Investigate the values of
- λ
- and
- μ
- so that the equations
- $2x+3y+5z=9$
- ,
- $7x+3y-2z=8$
- ,
- $2x+3y+\lambda z=\mu$
- , have (i) no solution, (ii) a unique solution and (iii) an infinite number of solutions.

UNIT-II

3. Find the transformation that will transform
- $10x^2 + 2y^2 + 5z^2 + 6yz - 10zx - 4xy$
- into a sum of squares

OR

4. Prove that
- $\frac{1}{2} \begin{bmatrix} i & \sqrt{3} \\ \sqrt{3} & i \end{bmatrix}$
- is a unitary matrix. Find its eigen values.

UNIT-III

5. If the temperature of a body is changing from
- 100°C
- to
- 70°C
- in 15 minutes, find when the temperature will be
- 40°C
- , if the temperature of air is
- 30°C
- .

OR

6. Solve
- $\frac{dy}{dx} + x \sin 2y = x^3 \cos^2 y$

UNIT-IV

7. Solve
- $\frac{d^2 y}{dx^2} + y = \cos ec x$
- by the method of variation of parameters.

OR

8. Solve
- $(D^2 - 1)y = x \sin x + x^2 e^x$

UNIT-V

9. Verify Rolles theorem for
- $f(x) = 2x^3 + x^2 - 4x - 2$
- in
- $[-\sqrt{2}, \sqrt{2}]$

OR

10. Let
- $r^2 = x^2 + y^2 + z^2$
- and
- $V = r^m$
- then prove that
- $V_{xx} + V_{yy} + V_{zz} = m(m+1)r^{m-2}$

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R-17

Code: 7G111

I B.Tech. I Semester Supplementary Examinations March 2021

Problem Solving Techniques and C Programming

(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 an algorithm to check the given number is perfect number or not.
- b) List and explain various symbols used in flowcharts with figures

OR

- 2. Discuss about different computer languages with examples.

UNIT-II

- 3. Explain with examples the different types of operators used in C.

OR

- 4. a) Describe the structure of a C program with example
- b) Explain about data types in C programming language.

UNIT-III

- 5. a) In what way a do – while loop differs from while loop. Explain.
- b) Write a C program to find whether the given number is prime numbers or not.

OR

- 6. Explain the syntax of else if ladder and write a C program to read the value of x and evaluate the following function.

$$Y = \begin{cases} 1 & \text{for } x > 0 \\ 0 & \text{for } x = 0 \\ -1 & \text{for } x < 0 \end{cases}$$

Using else if statement and nested if statement.

UNIT-IV

- 7. Describe creation and initialization of two dimensional arrays and write a C program to perform sum of two matrices.

OR

- 8. Define string and explain various string input/output functions with suitable examples.

UNIT-V

- 9. What is function? Explain different parameter passing methods in functions with example.

OR

- 10. a) Explain about static and register storage classes.
- b) Write a C program to find factorial of a number using recursion.

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Code: 7GC11

I B.Tech. I Semester Supplementary Examinations March 2021

Technical English & Professional Communication

(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) Explain the concept of 'Technology with a Human Face' and state why modern technology does not enrich man but empties him.
- b) Fill in the blanks in the following sentences using the hints given in brackets.
 - i. The only way to ___ women is to give them education.(a word with the prefix em-)
 - ii. Once the process of contamination of water begins, it is __. (a word with the prefix ir-)
 - iii. My friend speaks English _____ and correctly. (freely, fluently)
 - iv. You have to _____ to many challenges in your life. (Phrasal verb with face)
 - v. The man is moving _____ the building. (at/ towards)

OR

2. Explain in brief the major elements of human communication.

UNIT-II

3. a) According to E.K. Federov what do human beings often tend to forget when engaging in large-scale developmental activities?
- b) Write a letter of application to the principal of your college requesting him/her to let you appear for terminal exams which you had skipped.

OR

4. Discuss the flow of communication.

UNIT-III

5. a) What are the two kinds of technologies currently used to generate solar power on a large scale?
- b) Complete the following sentences with appropriate words chosen from those in brackets:
 - i. How many _____ are there in each character in MS Word? (bytes/bites)
 - ii. Students are given an essay about the human _____ in the exam. (soul/sole)
 - iii. We saw a _____ and a tiger when we visited the local zoo.(boar/bore)
 - iv. Our _____took us through the Alps and then on to Italy. (route / root)
 - v. When it's low _____ you have to walk a long way before you can swim. (tide/tied)

OR

6. Explain the different types of Non-verbal communication in brief?

UNIT-IV

7. a) Discuss some of the measures that are used to prevent soil erosion.
- b) The management of your company proposes to establish a school near the factory site for the benefit of its staff. As Public Relations Officer you have been asked to study its feasibility and submit a report to the Personnel Manager, specially referring to the following: finance, teaching staff, library, games and sports, construction cost, etc.

OR

8. Discuss in detail the Discriminative and Comprehensive listening.

UNIT-V

9. Discuss the two ways in which one can work without expecting anything in return.

OR

10. Write in brief the different kinds of models of communication.
