

Hall Ticket Number :

--	--	--	--	--	--	--	--	--	--

**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

\*\*\*

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Code: 7G311

I B.Tech. I Semester Supplementary Examinations March 2021

**Fundamental of Electrical & Electronics Engineering**

( Common to EEE &amp; 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**

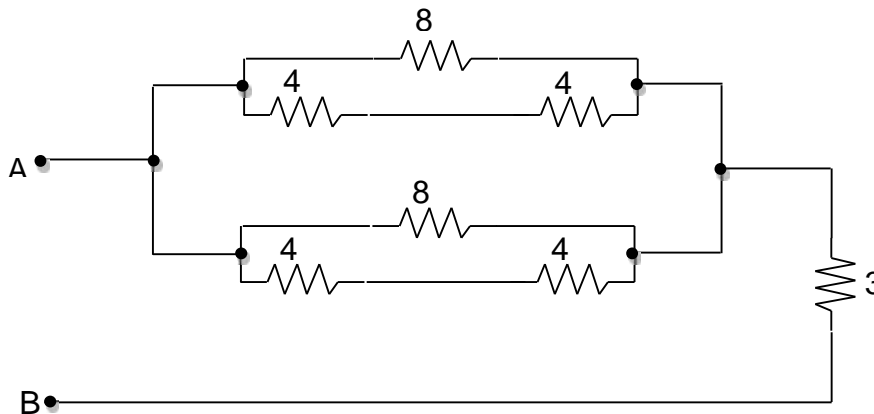
- Find the resistor values for the color codes given below.
  - Brown, Black, Orange
  - Orange, Orange, Red
  - Yellow, Violet, Red
  - Green, Grey, Blue
  - Red, Red, Red

**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
- $\lambda$
- and
- $\mu$
- 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
- $100^\circ\text{C}$
- to
- $70^\circ\text{C}$
- in 15 minutes, find when the temperature will be
- $40^\circ\text{C}$
- , if the temperature of air is
- $30^\circ\text{C}$
- .

**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
- $V_{xx} + V_{yy} + V_{zz} = m(m+1)r^{m-2}$

\*\*\*

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

<b>R-17</b>
-------------

**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 )

\*\*\*\*\*

<b>UNIT-I</b>
---------------

- 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.

<b>UNIT-II</b>
----------------

- 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.

<b>UNIT-III</b>
-----------------

- 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.

<b>UNIT-IV</b>
----------------

- 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.

<b>UNIT-V</b>
---------------

- 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.

\*\*\*

--	--	--	--	--	--	--	--	--	--

**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.

\*\*\*