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**Code: 5G513**

I B.Tech. I Semester Supplementary Examinations May / June 2019

**Engineering Drawing-I**

( Common to EEE, ECE, CSE &amp; IT )

Max. Marks: 70

Time: 3 Hours

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

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**UNIT-I**

1. a) Divide a line of 117 mm into i). 9 equal parts ii). 16 equal parts
- b) Construct a triangle of side length 35 mm

**OR**

2. a) Describe a regular pentagon about a circle of 90 mm diameter.
- b) Draw a tangent to a circle with 45 radius.

**UNIT-II**

3. Construct a hyperbola, with the distance between the focus and the directrix as 50 and eccentricity as  $\frac{3}{2}$ . Also draw normal and tangent to the curve point at a point 40 from the directrix.

**OR**

4. Construct an ellipse of major axis is 90mm and minor axis is 45 mm by Oblong method. Draw a tangent to it at any convenient point.

**UNIT-III**

5. Construct a hypocycloid, rolling circle of 55 mm diameter and directing circle of 125 mm diameter. Draw a tangent to it at a point 40 mm from the center of directing circle.

**OR**

6. Draw a hypo-cycloid of a circle of 40 mm diameter, which rolls inside another circle of 160 mm diameter, for one revolution counter clockwise. Draw a tangent and normal to it at a point 65 mm from the center of the directing circle.

**UNIT-IV**

7. a) A point P is 50 from both the principle planes of projection. Draw its possible projections.
- b) A line AB, 70 mm long, is in the VP and perpendicular to the HP. Draw its projections if the end B is 20 mm above HP.

**OR**

8. a) Two points P and Q are on HP. The point P being 40 in front of VP, while Q is 50 behind VP. The line joining their top views makes an angle of  $45^\circ$  with XY. Find the horizontal distance between two points.
- b) A line AB, 55 mm long, is perpendicular to the VP and is 45 mm above the HP. Draw its projections if the nearest end is 15 mm in front of the VP.

**UNIT-V**

9. A line AB, 90 mm long is inclined at  $45^\circ$  to the H.P. and its top view makes an angle of  $60^\circ$  with the V.P. The end A is in the H.P. and 12 mm in front of the VP. Draw its projections and find its true inclination with the V.P.

**OR**

10. The front view of a 125 mm long line PQ measures 75 mm and its top view measures 100 mm. Its end Q and the mid – point M are in the first quadrant, M being 20 mm from both the planes. Draw the projections of the line PQ.

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Hall Ticket Number :									
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**R-15**

**Code: 5GC14**

I B.Tech. I Semester Supplementary Examinations May / June 2019

**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 )

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**UNIT-I**

1. Solve  $x \frac{dy}{dx} + y = x^3 y^6$

**OR**

2. a) Solve  $(1 + y^2)dx = (\tan^{-1} y - x)dy$   
 b) A bacterial culture, growing exponentially, increases from 100 to 400 grams in 10 hours. How much was present after 3 hours

**UNIT-II**

3. Solve  $(D^2 + 4)y = x^2 + \cos 2x$

**OR**

4. Using the method of variation of parameters, solve  $(D^2 + 4)y = \tan 2x$

**UNIT-III**

5. a) Verify Lagrange's Mean value theorem for  $f(x) = e^x$  in  $[0,1]$   
 b) Using Maclaurin's series, expand  $f(x) = \log(1+x)$

**OR**

6. Test for convergence of the series  $\frac{1}{2\sqrt{1}} + \frac{x^2}{3\sqrt{2}} + \frac{x^4}{4\sqrt{3}} + \frac{x^6}{5\sqrt{4}} + \dots \dots \dots \infty$

**UNIT-IV**

7. If  $u = x^2 - 2y, v = x + y + z, w = x - 2y + 3z$ , then find  $\frac{\partial(u,v,w)}{\partial(x,y,z)}$

**OR**

8. Find the maximum and minimum values of  $x^3 + y^3 - 3axy$

**UNIT-V**

9. Trace the curve  $x = a(\theta + \sin \theta), y = a(1 + \cos \theta)$

**OR**

10. Trace the curve  $r = a \sin 3\theta$

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Hall Ticket Number :

R-15

Code: 5GC13

I B.Tech. I Semester Supplementary Examinations May / June 2019

**Engineering Physics**  
( Common to EEE and ECE )

Max. Marks: 70

Time: 3 Hours

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

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**UNIT-I**

1. a) What is meant by acceptance angle for an optical fiber? Obtain mathematical expression for acceptance angle and numerical aperture. 8M  
b) Write some differences between step index fiber and graded index fiber. 6M

**OR**

2. a) Explain construction and working of He-Ne laser. 10M  
b) Write some differences between Spontaneous emission and Stimulated emission of radiation. 4M

**UNIT-II**

3. a) Describe with suitable diagram, the powder method for determination of crystal structure. 10M  
b) A beam of X-rays is incident on a NaCl crystal with lattice spacing 0.282nm. Calculate the maximum order of diffraction possible if wavelength of X-rays used is  $0.841^{\circ}$ A. 4M

**OR**

4. a) Discuss various non-destructive testing systems which are commonly adopted in industries using ultrasonics. 7M  
b) Explain the ultrasonic flaw detector. 7M

**UNIT-III**

5. a) Apply Schrodinger's wave equation to the case of particle confined in a box and show that the energies of particle are quantized. 10M  
b) The minimum energy for a particle entrapped in a one dimensional box is  $3.2 \times 10^{-18}$  J. What are the next three energies in electron volts the particle can have.. 4M

**OR**

6. a) Describe the salient features of Kronig-Penny model. 8M  
b) Explain Fermi- Dirac distribution function of electron. 6M

**UNIT-IV**

7. a) Write a note on direct band gap and indirect band gap semiconductors. 8M  
b) Distinguish between intrinsic semiconductor and extrinsic semiconductor. 6M

**OR**

8. a) What are Cooper pairs? Explain 8M  
b) Write a note on the applications of superconductors. 6M

**UNIT-V**

9. a) Explain hysteresis loop observed in ferromagnetic materials. 10M  
b) A magnetic material has a magnetization of 3300 A/m and flux density of 0.0044 W/m<sup>2</sup>. Calculate the magnetizing field strength. 4M

**OR**

10. a) Explain in detail various properties of nanomaterials. 8M  
b) Write some optical applications of nanomaterials. 6M

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Hall Ticket Number :

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**R-15**

**Code: 5G111**

I B.Tech. I Semester Supplementary Examinations May / June 2019

**Problem Solving Techniques and Introduction to 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 )

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**UNIT-I**

1. a) Explain the various problem solving strategies with example. 7M
- b) Write an algorithm to find the greatest number among 3 numbers 7M

**OR**

2. a) Differentiate between high level and low level language with example 7M
- b) What do you mean by error in a program? Explain the strategies to handle the error. 7M

**UNIT-II**

3. a) Classify the operators in "C" with example. 7M
- b) Explain the structure of a C program with an example. 7M

**OR**

4. a) Explain the primitive data types of C with example. 8M
- b) Explain type conversion in c 6M

**UNIT-III**

5. a) Write a C program to illustrate the working of jump statements break and continue 8M
- b) Explain the "nested if" concept of C by an example. 6M

**OR**

6. a) Write a C Program to Display Fibonacci Sequence of 8 numbers 7M
- b) Write the concept of "do while" and "while". When to use do while in a program explain with an appropriate example. 7M

**UNIT-IV**

7. a) Write a C Program to Find the Frequency of Characters in a String 7M
- b) Explain the applications of String with suitable example. 7M

**OR**

8. a) Write a program to find the smallest number of an integer array. A={34, 45,6, 7,89} 7M
- b) Write a C Program to Copy String Without Using strcpy() 7M

**UNIT-V**

9. a) Explain various type of qualifiers in C language. Write the importance of "Static" key word. 7M
- b) Write a program using function to design an arithmetical calculator. 7M

**OR**

10. a) Explain the concept of pre-processor commands. 7M
- b) Write a C Program to Find GCD Using Recursion. 7M

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**Code: 7GC11**

I B.Tech. I Semester Supplementary Examinations May / June 2019

**Technical English & Professional Communication**

( Common to All Branches )

Max. Marks: 70

Time: 4 Hours

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

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**UNIT-I**

1. a) Why does E.F.Schumacher state that 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. He was not happy with her decision. He may \_\_\_\_\_ with her. (a word with the prefix dis\_)
  - ii. He enjoys \_\_\_\_\_ his friends. (to meet/ meeting)
  - iii. Good sleep is \_\_\_\_\_ to health. (beneficial/benificial)
  - iv. Rita \_\_\_\_\_ from the shock of her uncle's death. (Phrasal verb with 'get')
  - v. Anything written in a letter after it is signed is known as \_\_\_\_\_. (postscript/postdiction)

**OR**

2. Discuss the different elements of human communication?

**UNIT-II**

3. a) What are the main ways in which human development has affected climate patterns on the earth?
- b) Write a letter of application in response to an advertisement for the post of Project Manager in a reputed software company.

**OR**

4. Discuss the different levels 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) What are the measures to be taken to prevent soil erosion?
- b) Correct the following sentences
- i. The second innings are going on now
  - ii. Either Ramu or Somu might offer their services.
  - iii. My friend sits besides me in the class
  - iv. Each of the candidates were awarded a certificate.
  - v. One must love his parents.

**OR**

8. Discuss the different types of listening.

**UNIT-V**

9. How the idea of 'samskara' is explained in the essay "The Secret of Work"?

**OR**

10. Write about Linear, Interactive and Transactional communications.

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**Code: 5G311**

I B.Tech. I Semester Supplementary Examinations May / June 2019

**Electronic Devices and Circuits-I**

( 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 )

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**UNIT-I**

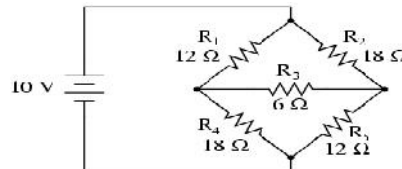
1. a) Determine the color coding for the following resistances.  
(i) 33K (ii) 4.7K (iii) 1K (iv) 100
- b) Draw and explain the symbols of voltage and current Sources.

**OR**

2. a) List out the various dependent and independent sources.
- b) Classify the types of resistors. Explain about any two fixed resistors with neat sketches.

**UNIT-II**

3. a) Distinguish between Star and Delta conversions.
- b) Find the Current through 6 Resistor Using any theorem.

**OR**

4. a) Describe the Maximum power transfer theorem with suitable example.
- b) Identify the dependent, independent voltage and current sources.

**UNIT-III**

5. a) Summarize the effect of temperature on the V-I characteristics of PN junction diode.
- b) Outline the operation of PN-Diode in Forward and reverse bias conditions.

**OR**

6. a) Summarize the effect of temperature on the V-I characteristics of PN junction diode.
- b) Outline the operation of PN-Diode in Forward and reverse bias conditions.

**UNIT-IV**

7. a) A Full wave rectifier is supplied from 230V, 50Hz and uses a transformer of turn's ratio of 15:1. It uses load resistance of 50 . Calculate load voltage (VDC) and ripple voltage.
- b) How AC can be converted to DC, interpret with the help of circuit and wave forms.

**OR**

8. a) Draw the Block diagram of Capacitor filter and explain it.
- b) Derive the expressions of ripple factor and efficiency for a full Wave rectifier.

**UNIT-V**

9. a) Explain the working principle of NPN transistor
- b) What is early effect? How does it modify the V-I characteristics of a BJT.

**OR**

10. a) Discuss about the input and output characteristics of BJT in CB configuration.
- b) Elaborate the working principle of NPN transistor with neat diagrams.

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