Hall Ticket Number :										

R-15

Code: 5G311

I B.Tech. I Semester Supplementary Examinations June 2017

Electronic Devices and Circuits -I

(Common to EEE & ECE)

Max. Marks: 70 Time: 3 Hours

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

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UNIT–I

1. a) Describe the types of resistors and color coding of resistors. 8M

   b) Explain how Capacitor and inductor stores electric and magnetic energy. 6M

OR

2 a) Explain voltage and current sources. 7M

   b) Write the applications of Capacitor and Inductor. 7M

UNIT–II

3 a) State ohms law and draw the curve between voltage and current. 8M

   b) State and explain superposition theorem. 6M

OR

4 a) Draw series and parallel circuits. 6M

   b) State and explain Thevenins theorem. 8M

UNIT–III

5 a) Draw and explain the ideal, simplified and piecewise V-I characteristics of PN diode. 8M

   b) A Silicon diode has reverse saturation current of 7.5 μA at room temperature (300 ^{o}K). Calculate reverse saturation current at 400 ^{o}K. 6M

OR

6 a) Draw and explain the V-I characteristics of Zener diode. 7M

   b) Derive an expression for transition capacitance (C_T) of PN diode. 7M

UNIT–IV

7 Explain the working of bridge rectifier with a neat diagram. Derive expressions for ripple factor and efficiency. 14M

OR

8 In a full wave rectifier using LC filter, L = 10 H, C = 100 μF and R_L = 500 Ω. Calculate I_{DC}, V_{DC} and ripple factor for an input V_i = 30 Sin (100 πt). 14M

UNIT–V

9 a) With respect to BJT, explain the following terms.
   i) Bandwidth modulation ii) Early effect 6M

   b) Explain with the help of a neat diagram show different current components in a BJT. 8M

OR

10 a) Derive the relation between α and β of BJT. 6M

   b) For a BJT, calculate: i) α and ii) β,
   if base current is 20 μA and collector current is 5 mA. 8M

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Hall Ticket Number :										

Code: 5G513

R-15

I B.Tech. I Semester Supplementary Examinations June 2017

Engineering Drawing-I

(Common to EEE, ECE, CSE and 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) Draw a regular hexagon of 50mm side

   b) Construct a regular heptagon of 45mm side

OR

2. a) Inscribe a regular pentagon in a circle of 100mm diameter.

   b) Draw a circle of 80mm diameter. Construct an equilateral triangle inside this circle, the vertices being on the circle.

UNIT–II

3. The distance between the focus and directrix of an ellipse is 45mm. construct the ellipse, if the eccentricity is ¾

OR

4. Inscribe an ellipse in a rectangle of sides 85mm & 50mm. draw a normal and tangent to the curve at a point on it 20mm from the major axis.

UNIT–III

5. Construct a cycloid with a rolling circle of 50mm diameter. Draw a tangent to the curve at a point on it 40mm from the directing line.

OR

6. A circle of 40mm diameter rolls without slipping, on another circle of 120mm. diameter. Draw the epicycloid.

UNIT–IV

7. The top view of a 80mm long line measures 60mm. the line is in the V.P. and its one end is 20mm above the H.P. draw its projection and find its inclination with the H.P.

OR

8. Two pegs fixed on a wall are 5m apart. The distance between the pegs, measured parallel to the floor is 4m. if one peg is 2m above the floor, find the height of the 2nd peg above the floor, graphically

UNIT–V

9. PQ is a 125mm long line. Its top view is 110mm long and the front view is 80mm long. P is 20mm above H.P. and 20mm in front of V.P. Draw its projections and determine its inclinations with H.P. & V.P.

OR

10. A line AB, 80 mm long, has A in H.P. but 15mm in front of V.P. The line is inclined at 30^0 to H.P. and 60^0 to V.P. Draw its projections and determine the length of front view and top view.

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Hall Ticket Number :										

R-15

Code: 5GC14

I B.Tech. I Semester Supplementary Examinations June 2017

Engineering Mathematics-I

(Common All Branches)

Max. Marks: 70 Time: 3 Hours

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

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UNIT–I

1. a) Solve $(x+2y^3)\frac{dy}{dx}=y$ 7M

   b) Find the orthogonal trajectories of the family of confocal conics $\frac{x^2}{a^2}+\frac{y^2}{b^2+\text{a}}=1$ where λ is the parameter 7M

OR

2. a) Solve $\frac{dy}{dx}=\frac{y}{x+\sqrt{xy}}$ 7M

   b) A body originally at 80^0C cools down to 60^0C in 20 minutes, the temperature of the air being 40^0C. What will be the temperature of the body after 40 minutes from the original? 7M

UNIT–II

3. a) Solve $\frac{d^2y}{dx^2}-3\frac{dy}{dx}+2y=e^{3x}$ 7M

   b) In an L.C.R circuit the charge *q* on a plate of a condenser is given by $L\frac{d^2q}{dt^2}+R\frac{dq}{dt}+\frac{q}{C}=E\,Sinpt$ the circuit is turned to resonance so that $p^2=\frac{1}{LC}$ find the current *i* 7M

OR

4. a) Solve $\frac{d^2y}{dx^2}-6\frac{dy}{dx}+25y=e^{2x}+\sin x+x$ 7M

   b) Solve $(D^3+2D^2+D)y=x^2e^{2x}+\sin^2 x$ 7M

UNIT–III

5. a) Solve in series the equation $\frac{d^2y}{dx^2}+x^2y=0$ 7M

   b) Verify Rolle's theorem for $f(x)=(x-a)^m(x-b)^n$ where m, n are positive integers in [*a, b*]. 7M

OR

6. a) Solve in series the equation $(1-x^2)\frac{d^2y}{dx^2}-x\frac{dy}{dx}+4y=0$ 7M

   b) Expand $e^{a\sin^{-1}x}$ in ascending powers of x 7M

UNIT–IV

7. a) Find first and second partial derivatives of $f(x,y) = ax^2 + 2hxy + by^2$ and verify $\frac{\partial^2 f}{\partial x \partial y} = \frac{\partial^2 f}{\partial y \partial x}$ 7M

   b) Find the maximum and minimum values of $x^3 + 3xy^2 - 15x^2 - 15y^2 + 72x$ 7M

OR

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

   b) Find the dimensions of the rectangular box, open at the top, of maximum capacity whose surface is 432 sq.cm. 7M

UNIT–V

9. Trace the curve $y^2(a-x) = x^3$, $a > 0$ 14M

OR

10. Trace the curve $r = a\,Sin3\theta$ 14M

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Hall Ticket Number :										

Code: 5GC13

R-15

I B.Tech. I Semester Supplementary Examinations June 2017

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 population inversion? 7M

   b) Write few applications of lasers 7M

OR

2. Explain how optical fibre is used in sensors. 14M

UNIT–II

3. a) Obtain an expression to determine the separation between two planes in a crystal structure. 10M

   b) The density of copper is 8980 Kg/m^3 and unit cell dimension is 3.61 A^0. Atomic weight of copper is 63.54. Dtermine crystal structure . Calculate atomic radius and interplanar spacing of (110) plane. 4M

OR

4. a) Write in detail about point defects. 8M

   b) Distinguish between schottky and Fresnel defects in ionic crystals. 6M

UNIT–III

5. a) What is conductivity and derive expression for it 7M

   b) Write a note on sources of electrical resistance of metal 7M

OR

6. a) Describe Fermi-Dirac distribution function with temperature 7M

   b) Find temperature at which there is 1% probability that a state with energy 0.5eV above Fermi energy 7M

UNIT–IV

7. a) Explain the concept of drift and diffusion currents. How they are different? 5M

   b) Derive Einstein relation in semiconductors and explain its significance. 9M

OR

8. Write about the following

   (a) Applications of LED and Photo diode

   (b) Structure and properties of ferrites

   (c) Establish the relation between magnetic susceptibility and permeability 14M

UNIT–V

9. a) Describe the synthesis of nanomaterials by sol-gel method 7M

   b) Mention the applications of nanomaterials in Biomedical field 7M

OR

10. a) Explain the superconducting state of metals with respect to temperature and magnetic field. 8M

    b) Explain the variation of London penetration depth w.r.to temperature with diagram 6M

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Hall Ticket Number :										

R-15

Code: 5GC11

I B.Tech. I Semester Supplementary Examinations June 2017

English through Literature

(Common All Branches)

Max. Marks: 70 Time: 3 Hours

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

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UNIT–I

1. Estimate G.B. Naidu's contribution to the field of science. 14M

OR

2. a) How does the poet describe nature in "The Road not Taken"? 7M

   b) Assess the character of Cabuliwala. 7M

UNIT–II

3. a) Give the summary of Rudyard Kipling's poem "If". 7M

   b) In what way Sudha Murthy's life remain exemplary? 7M

OR

4. Critically analyse the story "A Dog's Tale" 14M

UNIT–III

5. Justify the title of the story " Gift of Magi" 14M

OR

6. a) Appreciate the poem "Leisure 7M

   b) Write a note on Vijay Bhatkar 7M

UNIT–IV

7. a) Compare the attitude of father with that of peasants in "Night of the Scorpion"? 7M

   b) Estimate the contribution of Bose to the field of science 7M

OR

8. Examine the role of fate in "An Astrologer's Day" 14M

UNIT–V

9. Critically appreciate Chekhov's play "The Proposal" 14M

OR

10. Who is Homi Jehanghir Baba? Briefly discuss the various positions he held, institutions he established and awards he received and contributions he made to the development of India. 14M

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Hall Ticket Number :										

R-15

Code: 5G111

I B.Tech. I Semester Supplementary Examinations June 2017

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 = 70Marks)

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UNIT–I

1. a) What is the role of Debugging programs in implementation of algorithms? 6M
   b) Define Flow Chart? Draw a flow chart to read 50 numbers and print their sum. 8M

OR

2. a) What is the need of Computer Language? Describe different computer languages in detail. 7M
   b) Does the use of Procedures will emphasize modularity of the program? Justify. 7M

UNIT–II

3. a) List and explain various Bitwise Operators with suitable examples. 6M
   b) What are the rules to be followed in naming a variable? 8M

OR

4. a) What is a data type? Write in brief about the data types in C. 6M
   b) Illustrate about various input and output statements in C. 8M

UNIT–III

5. a) Differentiate break and continue with a suitable example. 5M
   b) Write code segments for displaying numbers from 1 to 10 using While, do ..while, and for statements. 9M

OR

6. a) Illustrate multi way selection statement with sample c code. 7M
   b) Write a C program to find the given number is palindrome or not. 7M

UNIT–IV

7. a) Write a C program to find the maximum element in an array. 7M
   b) Write a C program to find the occurrence of a substring in a given string. 7M

OR

8. What is an Array? How to declare two dimension array? Write a C program to perform multiplication of two matrices. 14M

UNIT–V

9. a) Compare library functions and user-defined functions. 7M
   b) Write a C program which uses a recursive function to evaluate, $F(x) = x - x^3/3! + x^5/5! - x^7/7! + \ldots..$ 7M

OR

10. What are the storage classes in C? Explain their usage with suitable examples. 14M

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