Code: 5GC11

R-15

I B. Tech. I Semester Regular Examinations Dec/Jan 2015/2016
English through Literature
(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) | Describe the first meeting of Mini and Abdul Rehman, Cabuliwallah | 7M |
| | b) | What road did the poet choose? Does he regret his choice? | 7M |

OR

| 2. | | Describe the life of Cabuliwallah. | 14M |

| UNIT-II |

| 3. | | What kind of life the dog leads from its childhood to adulthood in Mark Twain is "A dog's tale"? | 14M |

OR

| 4. | a) | What is the message presented in the poem 'If' by Rudyard Kipling? | 7M |
| | b) | What is the contribution of Sudha Murthy towards society? | 7M |

| UNIT-III |

| 5. | | What sacrifice do Della and Jim make for each other? | 14M |

OR

| 6. | | Why is Dr. Vijay Bhatkar referred to as the architect of India's Information technological revolution? | 14M |

| UNIT-IV |

| 7. | | Describe the astrologer's meeting with the stranger. What challenge they throw to each other? | 14M |

OR

| 8. | | Give a detailed account of J.C Bose's life at Presidency College. | 14M |

| UNIT-V |

| 9. | | What developments did Homi Jehangir Bhabha make towards nuclear programme? | 14M |

OR

| 10. | | What is the central theme of the play "The Proposal" by Anton Chekov? | 14M |

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Hall Ticket Number :

Code: 5GC13

R-15

I B. Tech. I Semester Regular Examinations Dec/Jan 2015/2016
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 = 70Marks)
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UNIT-I

1. a) Discuss theory of interference in thin films by reflection.   10M
    b) Explain why Newton rings are circular and centre of the pattern is dark in case
       of reflected light.   4M

OR

2. a) With the help of neat sketches explain the construction and working of He-Ne
       laser.   10M
    b) Describe important applications of Holography   4M

UNIT-II

3. a) Explain the classification of crystal systems in to seven classes.   10M
    b) Obtain expression for maximum orders possible when X-rays of wavelength
       are diffracted by crystal planes of interplanar spacing d. (assume   is glancing
       angle)   4M

OR

4. a) Write a short note on Miller indices for planes in crystal systems.   4M
    b) Describing important properties explain the production of ultrasonics by
       piezoelectric method.   10M

UNIT-III

5. a) Build time independent Schrodinger's wave equation for one dimensional case
       and extend it to a free particle.   10M
    b) Explain the physical significance of wave function .   4M

OR

6. a) Discuss the source of electrical resistivity and explain the dependence of
       electrical resistivity on temperature and impurity concentration.   10M
    b) Based on band theory classify solids into conductors, semiconductors and
       insulators.   4M

UNIT-IV

7. a) With suitable sketches explain direct and indirect band gap semiconductors.   6M
    b) Explain the construction and working of light emitting diode. Discuss its
       advantages   8M

OR

8. a) What is Bohr magnetron? Explain the origin of permanent magnetic moment in
       magnetic materials   10M
    b) Discuss the temperature dependence of magnetic suscpetability in para and
       ferromagnetics.   4M

UNIT-V

9. a) Give an account of BCS theory of superconductivity.   6M
    b) Explain DC & AC Josephson effects and mention its I-V Characteristics.   8M

OR

10. a) Describe different types of nanomaterials based on nano scale.   4M
    b) Explain synthesis of nanomaterials using ball mill and plasma arcing methods.
                                                                                     10M

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Code: 5GC14

I B. Tech. I Semester Regular Examinations Dec/Jan 2015/2016

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 = 70Marks)

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UNIT–I

1. a) Solve $\left(1+y^2\right)dx = \left(\tan^{-1}y - x\right)dy$ 7M

    b) Find the orthogonal trajectories of the family of $\dfrac{x^2}{a^2+\}} + \dfrac{y^2}{b^2+\}} = 1,$ } is the parameter   7M

OR

2. a) Solve $x\left(x-y\right)dy + y^2dx = 0$ 7M

    b) A tank initially contains 50 gallons of fresh water. Brine containing 2 pounds per gallon of salt, flows into the tank at the rate of 2 gallons per minute and the mixture kept uniform by stirring, runs out at the same rate. How long will it take for the quantity of salt in the tank to increase from 40 to 80 pounds?   7M

UNIT–II

3. a) Solve $\dfrac{d^2y}{dx^2} - 6\dfrac{dy}{dx} + 25y = e^{3x} + \sin x + x^2$ 7M

    b) Solve $y'' - 2y' + y = e^x \log x$ by the method of variation of parameters   7M

OR

4. a) Solve $\left(D^3 - 5D^2 + 7D - 3\right)y = e^{2x}\operatorname{Cosh}x$ 7M

    b) In an $L-C-R$ circuit, the charge q on a plate of a condenser is given by $L\dfrac{d^2q}{dt^2} + R\dfrac{dq}{dt} + \dfrac{q}{C} = E\sin pt$. The circuit is tuned to resonance so that $p^2 = 1/LC$. Find the current i 7M

UNIT–III

5. a) Solve $\left(1-x^2\right)y'' + 2y = 0$ by series method with $y(0) = 4,\ y'(0) = 5$ 7M

    b) Verify Rolles mean value theorem on $\left[a,b\right]$ for the function $f(x) = (x-a)^m(x-b)^n$, m,n are positive integers.   7M

OR

6. a) Solve in series of $9x(1-x)\dfrac{d^2y}{dx^2} - 12\dfrac{dy}{dx} + 4y = 0$ 7M

    b) Verify Taylors theorem for $f(x) = \log(1+x)$ with Lagranges form of remainder upto 2 terms in the interval $[0,1]$ 7M

UNIT–IV

7. a) If $z = f(x+ct) + w(x-ct)$ then prove that $\dfrac{\partial^2 z}{\partial t^2} = c^2\dfrac{\partial^2 z}{\partial x^2}$ 7M

    b) Find the maxima and minima of $f(x,y) = x^3y^2(1-x-y)$ 7M

OR

8. a) Let $r^2 = x^2 + y^2 + z^2$ and $V = r^m$ then prove that $V_{xx} + V_{yy} + V_{zz} = m(m+1)r^{m-2}$ 7M

    b) Find the maximum and minimum distances of the point $(3,4,12)$ from the sphere $x^2 + y^2 + z^2 = 4$ 7M

UNIT–V

9.   Trace the curve $y^2(x-a) = x^2(x+a)$ 14M

OR

10.   Trace the curve $r^2 = a^2\cos 2_\prime\prime$ 14M

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Code: 5G111

I B. Tech. I Semester Regular Examinations Dec/Jan 2015/2016
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) Explain software development method with suitable example.   10M
    b) Draw flowchart for factorial of a number.   4M

OR

2. a) What is an algorithm? Explain the properties of an algorithm and write an
       algorithm to find whether a number is even or odd.   7M
    b) What is flowchart? Describe various symbols used in flowcharts and draw
       flowchart for reversing the digits of a given number.   7M

UNIT–II

3. a) Define a variable. What are the rules used in naming a variable? Give examples.   5M
    b) What is data type? Explain basic data types and their sizes used in a C Language.   9M

OR

4   a) What is type conversion? Explain about implicit and explicit type conversion
       with suitable examples.   8M
    b) Define constant. Explain different types of constants used in c language with
       examples.   6M

UNIT–III

5   a) Define nested loop. Write a c program to print the following pattern.
          1 2 3 4 5
          1 2 3 4 5
          1 2 3 4 5   5M

    b) Write a c program to print the following pattern using while, do-while and for loop.
          1
          1 2
          1 2 3
          1 2 3 4   9M

OR

6. a) Explain if, if-else, nested-if and else-if-ladder with suitable examples.   10M
    b) Explain goto statement with suitable example program.   4M

UNIT–IV

7   a) Write a c program to read one matrix and find the sum of its diagonal elements.   8M
    b) What is string? Describe at least six string handling functions with suitable
       examples.   6M

OR

8   a) Define an array. Write a c program to perform matrix multiplication on two 3x3
       matrices.   7M
    b) Define string. Write a c program to find whether the given string is palindrome
       or not.   7M

UNIT–V

9   a) Write a c program to swap two numbers using call by value and call by
       reference.   9M
    b) What is library function? Explain about any five-library functions.   5M

OR

10 a) Write a short note on macros.   6M
    b) What is user defined function? Describe different categories of user defined
       functions with suitable examples.   8M

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I B. Tech. I Semester Regular Examinations Dec/Jan 2015/2016
Electronic Devices & 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) Compare active and passive elements and give example for each.   8M
    b) Explain different types of resistors with examples.   6M

OR

2. a) Give different types of capacitors and inductors.   6M
    b) Determine the color coding for given resistance values

       (i) 4.7K   (ii) 47K   (iii) 100K   (iv) 1M   8M

UNIT–II

3. a) Explain source transformation techniques.   6M
    b) State and explain Kirchhoff's laws.   8M

OR

4. a) State and explain maximum power transfer theorem with example.   6M
    b) Find the voltage across dependent source using thevenin's theorem
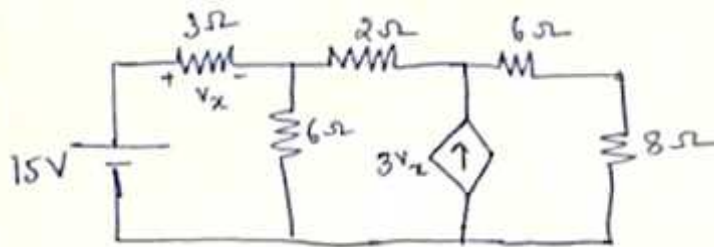
                                                                               8M

UNIT–III

5. a) Explain the operation of forward and reverse bias PN junction diode.   8M
    b) The voltage across a silicon diode at room temperature (300 K) is 0.7 volts
       when 2 mA current flows through it. If the voltage increases to 0.75 V, calculate
       the diode current (assume $V_T = 26mV$).   6M

OR

6. a) With the help of neat diagrams explain the characteristics of Zener diode 6M
    b) Derive the expression for Transition capacitance C_T of PN junction diode. 8M

UNIT–IV

7. a) Derive the expression for maximum efficiency of half wave and full wave rectifier. 8M
    b) Draw and explain the block diagram of regulated power supply (RPS).   6M

OR

8. a) Explain the operation of full wave rectifier with L-section and derive the
       necessary expression for Ripple factor.   14M

UNIT–V

9. a) Explain the working principle of NPN transistor.   8M
    b) Define the cutoff, active and saturation regions in characteristics of BJT
       transistor.   6M

OR

10. a) With the help of input & output characteristics, explain the operation of BJT CE
       configuration.   8M
    b) Compare the characteristics of a BJT in CB, CE and CC configurations.   6M

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Code: 5G513b

I B. Tech. I Semester Regular Examinations Dec/Jan 2015/2016
Engineering Drawing–I
(Electronics & Commnication Engineering)
Max. Marks: 70   Time: 3 Hours
Answer *all five* units by choosing one question from each unit (5 x 14 = 70Marks)
****

UNIT–I

1. a) Draw a line PQ 100 long. At any point O in it near its center, erect a perpendicular
        OA 65mm long. Through A, draw a line parallel to PQ.   7M
    b) Construct regular pentagon in a circle of 100mm diameter.   7M

OR

2. a) Construct a regular octagon of 40mm side.   7M
    b) Divide a line AB 80mm long in to 6 equal parts.   7M

UNIT–II

3. The vertex of a hyperbola is 65mm from its focus. Draw the curve if the eccentricity
    is 3/2. Draw a normal and a tangent at a point on the curve 75mm from the directrix.   14M

OR

4. The major axis of an ellipse is 120mm long and the minor axis is 80mm long.
    Construct an ellipse by 'Concentric Circle method'.   14M

UNIT–III

5. A circle of diameter 50mm rolls along the inside of another circle of diameter 200mm
    without slipping. Draw the path traced by a point on the smaller circle and also draw
    a tangent and a normal to the hypocycloid at any point 'p' on it.   14M

OR

6. Draw an epi-cycloid for a circle of diameter 50 mm which rolls on another circle of
    120mm diameter in clockwise direction. Also draw a normal and tangent to the curve at
    a distance of 90mm from the center of the directing circle.   14M

UNIT–IV

7. a) Draw the projections of the following points on a common reference line.
        i.   'P' 35mm behind the VP and 20mm below the HP
        ii. 'Q' 40mm in front of the VP and 20mm above the HP
        iii. 'R' 50mm behind the VP and 15mm above the HP
        iv. 'S' 35mm behind the VP and in the HP.   7M
    b) A point E is 20mm below the HP and 30mm behind the VP. Another point F is in
        front of the VP and above the HP. The distance between the projectors of the points
        is 60mm. Determine the position of the point F if the length of the lines joining the
        plans and elevations of the points E and F are 80mm and 90mm respectively.   7M

OR

8. a) A line PQ 70mm long is parallel to the HP and inclined at 30° to the VP. The end P
        is 25mm above the HP and 40mm in front of the VP. Draw the projections of the
        straight line.   7M
    b) A line MN, 70mm long lies in the VP and has the end M in both HP and the VP. It is
        inclined at 35° to the HP. Draw the projections of the line.   7M

UNIT–V

9. One end P of a line PQ, 55mm long is 35mm in front of the VP and 25mm above the
    HP. The line is inclined at 40° to the HP and 30° to the VP. Draw the projections of
    the line PQ.   14M

OR

10. A line PF, 65mm long has its end P 15mm above the HP and 15mm in front of the
    VP. It is inclined at 55° to the HP and 35° to the VP. Draw its projections.   14M

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