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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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 $(1+y^2)dx = (\tan^{-1}y - x)dy$ 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 $x(x-y)dy + y^2 dx = 0$ 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 $(D^3 - 5D^2 + 7D - 3)y = e^{2x} \operatorname{Cosh} x$ 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 $(1-x^2)y'' + 2y = 0$ by series method with $y(0) = 4$, $y'(0) = 5$ 7M

   b) Verify Rolles mean value theorem on $[a,b]$ 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 $f(x,y) = x^3 y^2 (1-x-y)$ 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 $r^2 = a^2 \cos 2\theta$ 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
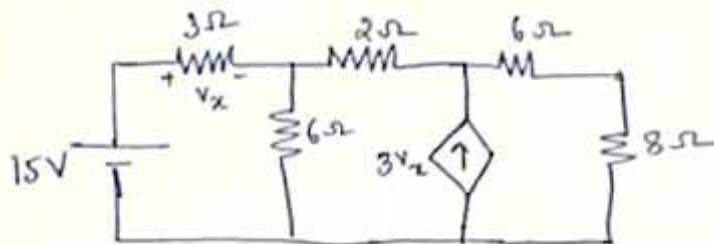
                                                                                        8M

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: 5G513a

R-15

I B. Tech. I Semester Regular Examinations Dec/Jan 2015/2016
Engineering Drawing–I
(Common to EEE & IT)

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) Bisect an angle of 45^0 4M
   b) Construct a hexagon of sides 45 mm, using general construction method.   10M

OR

2. a) Divide a line AB of 90 mm in to ten equal parts   4M
   b) Construct a pentagon of sides 45 mm, using general construction method.   10M

UNIT–II

3. Construct a parabola, with the distance of the focus from the directrix as 45 mm. Also, draw a normal and tangent to the curve at a point 40 mm from the directrix.   14M

OR

4. Construct an ellipse, with distance of the focus from the directrix as 50 mm and eccentricity as 2/3. Also find the normal and tangent to the curve at a point 70 mm from directrix.   14M

UNIT–III

5. A circle of 40 mm diameter rolls on a horizontal line for one revolution, clock wise. Draw the locus of a point on the circle. Also, draw a tangent and a normal to the curve at a point 35 mm from the directing line.   14M

OR

6. Draw a hypo-cycloid of a circle of 40 mm diameter, which rolls inside on another circle of 160 mm diameter for one revolution in counter clock-wise direction. Draw a tangent and a normal to it at a point 65 mm from the centre of the directing circle.   14M

UNIT–IV

7. a) A point Q is 45 mm from both the principal planes of projection. Draw its projections.   4M
   b) A point A is 15 mm above HP and 20 mm in front of VP. Another point B is 25 mm behind VP and 40 mm below HP. Draw the projections f A and B, keeping the distance between the projectors equal to 90 mm. Draw straight lines, joining (**i**) the top views and (**ii**) the front views.   10M

OR

8. a) A line AB, of 25 mm long is perpendicular to HP and parallel to VP. The end points A and B of the line are 35 mm and 10 mm above HP respectively. The line is 20 mm in front of VP. Draw the projections of the line.   7M
   b) A line AB is 30 mm long and inclined at 30^0 to HP and parallel to VP. The end A of the line is 15 mm above HP and 20 mm in front of VP. Draw the projections of the line.   7M

UNIT–V

9. A line AB of 75 mm long is inclined at an angle of 40^0 to HP and 40^0 to VP. One end of the line is 25 mm above HP and 30 mm in front of VP. Draw its projections.   14M

OR

10. A line AB of 80 mm long has its end A, 15 mm from both HP and VP. The other end B is 40 mm above HP and 50 mm in front of VP. Draw the projections of the line and determine the inclinations of the line with HP and VP.   14M

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