I B.Tech. I Semester Regular & Supplementary Examinations December 2016

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) Find the color coding for the give resistance values.

    i) 2.7 KΩ ii) 4.2 KΩ iii) 5.6 KΩ iv) 8.2 KΩ 8M

    b) Explain the types of resistors, capacitors, and inductors.   6M

OR

2. a) Draw and explain the symbols for voltage source, and current source.   6M

    b) Write the properties and applications of capacitors and inductors.   8M

UNIT–II

3. a) State and explain ohms law and Kirchoff's voltage law (KVL).   8M

    b) State and explain Thevenin's theorem.   6M

OR

4. a) State and explain Norton's theroem.   7M

    b) State and explain maximum power transfer theorem.   7M

UNIT–III

5. a) What is Fermi level? Indicate the position of Fermi level in intrinsic, N-type, P-type semiconductor band diagrams.   8M

    b) Compare Zener breakdown and avalanche break down.   6M

OR

6. a) Draw and explain energy band diagrams for P and N type semiconductors.   8M

    b) Explain temperature dependency of PN diode.   6M

UNIT–IV

7. a) Compare the performance of L, C, L-section and -section filters.   8M

    b) Derive an expression for ripple factor of full wave rectifier.   6M

OR

8.   With a neat sketch, explain the operation of full wave rectifier with C-filter and derive expression for ripple factor.   14M

UNIT–V

9. a) With respect to BJT, explain the following terms.

    i) emitter efficiency   ii) early effect   8M

    b) Explain how BJT acts as an amplifier.   6M

OR

10 a) Write the current components in PNP transistor and explain.   6M

    b) Draw and explain the input and output characteristics of BJT in common emitter configuration ,   8M

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Code: 5G513-C

R-15

I B.Tech. I Semester Regular & Supplementary Examinations December 2016

Engineering Drawing- I

(Computer Science and Engineering)

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) Construct a triangle of side length 50 mm

    b)   Construct a hexagon of side length 40 mm

OR

2. a) Divide a line of length 100 mm into 8 equal parts.

    b) Inscribe a pentagon in a circle of 50 mm diameter.

UNIT–II

3. The major axis of an ellipse is 150 mm long and the minor axis is 100 mm long. Find the foci and draw the ellipse by arcs of circles method. Draw a tangent to the ellipse at a point on it 25 mm above the major axis

OR

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

UNIT–III

5. Two points Q and S lie on a straight line through the centre C of a circle of 50 mm diameter, rolling along a fixed straight line. Draw and name the curves traced out by the points Q and S during one revolution of the circle. CQ = 20 mm, CS = 35 mm.

OR

6. A circle of 50 mm diameter rolls on the circumference of another circle of 175 mm diameter and outside it. Trace the locus of a point on the circumference of the rolling circle for one complete revolution. Name the curve. Draw a tangent and a normal to the curve at a pint 125 mm from the centre of the directing circle.

UNIT–IV

7. A point P is 15 mm above the HP and 20 mm in front of the V P. Another point Q is 25 mm behind the V P and 40 mm below the H P. Draw projections of P and Q keeping the distance between their projectors equal to 90 mm. Draw straight lines in their top and front views

OR

8. A 100 mm long line is parallel to and 40 mm above the H.P. Its two ends are 25 mm and 50 mm in front of the V.P. respectively. Draw its projections and find its inclination with the H.P.

UNIT–V

9. A line AB, 50 mm long, has its end A in both the H.P. and the V.P. It is inclined at 30^0 to the H.P. and at 45^0 to the V.P. Draw its projections.

OR

10. A Line PQ 100 mm long, is inclined at 30^0 to the H.P. and at 45^0 to the V.P. Its mid- point is in the V.P. and 20 mm above the H.P. Draw its projections.

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Code: 5G513-A

I B.Tech. I Semester Regular & Supplementary Examinations December 2016

Engineering Drawing–I

(Electronics and Communication Engineering)

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 line AB 125mm is to be divided into unequal parts by proportionate division method for the following proportions ½,1/3,1/4,1/5,1/6 of AB.

OR

2. Draw a regular pentagon of side 50mm. Draw another regular pentagon of side 80mm concentrically.

UNIT–II

3. The Major and minor axis of an ellipse are 125 and 100 long respectively. Draw half ellipse by concentric circles method and other half section by oblong method. Locate its foci and determine the eccentricity.

OR

4. Construct an ellipse with distance of the focus from the directrix as 50 eccentricity as 2/3. Also draw normal and tangent to the curve at a point 40 from the directrix.

UNIT–III

5. A circle 50 diameter rolls on a straight line without slipping. In the initial position the diameter AB of the circle is parallel to the line, on which it rolls. Draw the loci of the points A for one revolution of the circle.

OR

6. The diameter of the directing circle is twice that of the generating circle. Show that the hypo-cycloid is a straight line. Choose the diameter of the generating circle as 50.

UNIT–IV

7. Draw the projections of the following points keeping the distance between the projectors as 30 on the same reference line.

    (a) A – 30 above HP and 40 infront of VP
    (b) B – 25 above HP and 50 behind VP
    (c) C - on the HP and 25 infront of VP
    (d) D – on both HP and VP
    (e) E – 35 above HP and on the VP.

OR

8. Two points A and B are on HP, the point A being 30 in front of VP while B is 45 behind VP. The line joining their top views makes an angle 45^0 with xy. Find the horizontal distance between the two points.

UNIT–V

9. The midpoint of a line of 80 long is 25 above HP and 30 in front of VP. The line is inclined at 30^0 to HP and 40^0 with VP. Draw the projections of the line.

OR

10. A line CD of 100 long, is inclined at 45^0 to HP and 30^0 to VP. Its end A is on HP and 25 in front of VP. Draw the projections.

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I B.Tech. I Semester Regular & Supplementary Examinations December 2016
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 $3x(1-x^2)y^2\dfrac{dy}{dx}+(2x^2-1)y^3=ax^3$ — 7M

   b) Find the Orthogonal trajectory of the family of confocal conics $\dfrac{x^2}{a^2+\}}+\dfrac{y^2}{b^2+\}}=1$, } being the parameter. — 7M

OR

2. a) Solve $\cos^2 x\dfrac{dy}{dx}+y=\tan x$ — 7M

   b) Find orthogonal trajectories of the family of curves $r^2=a^2\cos 2_{„}$ — 7M

UNIT–II

3. a) Solve $\dfrac{d^2y}{dx^2}-6\dfrac{dy}{dx}+9y=6e^{3x}+7e^{-2x}-\log 2$ — 7M

   b) Solve by the method of variation of parameters $\dfrac{d^2y}{dx^2}+y=Co\sec x$ — 7M

OR

4. a) Solve $(D^3-D)y=2x+1+4\cos x+2e^x$ — 7M

   b) Solve by the method of variation of parameters $y^{11}-6y^1+9y=\dfrac{e^{3x}}{x^2}$ — 7M

UNIT–III

5. a) Solve in series the equation $\dfrac{d^2y}{dx^2}+y=0,\quad y(0)=0$ — 7M

   b) Prove that if 0 < a < b < 1,　$\dfrac{b-a}{1+b^2}\angle\tan^{-1}b-\tan^{-1}a\angle\dfrac{b-a}{1+a^2}$ hence show that
   $\dfrac{f}{4}+\dfrac{3}{25}\angle\tan^{-1}\dfrac{4}{3}\angle\dfrac{f}{4}+\dfrac{1}{6}$ — 7M

OR

6. a) Solve in series the equation $\dfrac{d^2y}{dx^2}+xy=0$ — 7M

   b) Using Taylor's series, express the polynomial $2x^3+7x^2+x-6$ in powers of (x-1) — 7M

UNIT–IV

7. a) If $U=\log(x^3+y^3+z^3-3xyz)$ prove that $\left(\dfrac{\partial}{\partial x}+\dfrac{\partial}{\partial y}+\dfrac{\partial}{\partial z}\right)^2 U=\dfrac{-9}{(x+y+z)^2}$ — 7M

   b) In a plane triangle, Find the maximum value of cosA cosB cosC. — 7M

OR

8. a) If $u=x+y+z,\quad uv=y+z,\quad uvw=z,$ show that $\partial(x,y,z)/\partial(u,v,w)=u^2v$ — 7M

   b) A rectangular box open at the top is to have volume of 32 cubic ft. Find the dimensions of the box requiring least material for its construction. — 7M

UNIT–V

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

OR

10. Trace the curve $r=a(1+\cos_{„})$ — 14M

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R-15

Code: 5GC13

I B.Tech. I Semester Regular & Supplementary Examinations December 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. Distinguish between gas and solid state lasers with examples.   14M

OR

2. Explain the optical fibre communication system.   14M

UNIT–II

3. Describe with suitable diagram the powder method for determination of crystal structure.   14M

OR

4. a) With a neat diagram explain the production of ultrasonics by piezoelectric method   10M

   b) What are the applications of ultrasonics?   4M

UNIT–III

5. a) Derive time independent form of Schrodinger's wave equation   10M

   b) Write physical significance of Schrodinger's wave equation   4M

OR

6. a) Discuss the motion of an electron in a periodic lattice and explain the formation of energy bands   10M

   b) Describe salient features of quantum electron theory   4M

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. a) Explain diamagnetism, paramagnetism and ferromagnetism.   8M

   b) With the help of neat diagrams explain temperature dependence of susceptibility in the above materials.   6M

UNIT–V

9. a) List out the general properties of superconductor   10M

   b) A lead superconductor with T_c = 7.2 K has a critical magnetic field of $6.5 \times 10^3 Am^{-1}$ at absolute zero. What would be the magnitude of critical magnetic field at 5K temperature   4M

OR

10. a) Describe the synthesis of nanomaterials by thermal evaporation method.   10M

    b) Mention four applications of nanomaterials in material technology   4M

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R-15

Code: 5GC11

I B.Tech. I Semester Regular & Supplementary Examinations December 2016
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. a) The poem "The Road not Taken" is about making choices. Discuss　　7M

   b) Why did Mini's father help Cabuliwallah?　　7M

OR

2. Briefly discuss the various facets of G.D. Naidu's personality　　14M

UNIT–II

3. a) Examine the values reflected by Rudyard Kipling in his poem "If"　　7M

   b) What kind of message Mark Twain tries to give through his story "A Dog's Tale"?　　7M

OR

4. Estimate Sudha Murthy's contribution to society　　14M

UNIT–III

5. a) Appreciate the story "The Gift of Magi"　　7M

   b) Interpret the poem "Leisure　　7M

OR

6. Discuss Vijaya Bhatkar as the architect of Indian IT industry.　　14M

UNIT–IV

7. a) What kind of superstitious beliefs do you find in the poem "Night of the Scorpion"?　　7M

   b) Describe the astrologer in "An Astrologer's Day".　　7M

OR

8. a) Write a few points about the childhood and early life of Bose.　　7M

   b) List out some of the achievements of Bose.　　7M

UNIT–V

9. Analyse the character of Natalya in Chekhov's *The Proposal.*　　14M

OR

10. Estimate the achievements of Homi Jehangir Baba in the field of science　　14M
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Code: 5G111

I B.Tech. I Semester Regular & Supplementary Examinations December 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) What are the General Problem solving strategies? Discuss.   7M
   b) Define Algorithm? Write an algorithm to read three integers and find the biggest number.   7M

OR

2. Illustrate different phases of Software Development Life Cycle (SDLC) with a neat diagram.   14M

UNIT–II

3. a) Describe the various steps involved in executing a C program.   7M
   b) What is Type Conversion? Illustrate type conversion with suitable example.   7M

OR

4. a) Write and explain the structure of C Program.   6M
   b) What are precedence and associativity of operators? Explain them with an example.   8M

UNIT–III

5. a) Compare While and do.. While statements with suitable example code.   8M
   b) Write a program to display the numbers, 1 to 100 except 29, 77 and 86.   6M

OR

6. a) Discuss in detail about the for Loop statements in C.   7M
   b) Write about the functioning of the jump statements, **break** and **continue** with suitable examples.   7M

UNIT–IV

7. a) What is an Array? Explain how to declare one dimensional array with example.   8M
   b) Write a C program to find the sum of all elements in the array.   6M

OR

8. What are the different String Library functions available in C? Explain them with example.   14M

UNIT–V

9. a) What is a function? What are the advantages of using functions in a program?   8M
   b) Explain in detail about Preprocessor Commands.   6M

OR

10. a) Describe the two parameter passing methods with suitable examples.   7M
    b) What is a recursive function? Write a C program to find the factorial of a given number using recursion.   7M

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