I B.Tech. II Semester Supplementary Examinations Nov/Dec 2016
Engineering Drawing- II
(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 Hexagonal plate of sides 30 mm is resting on HP on one of its corners on HP. The surface of lamina is inclined at 60^0 to HP. The opposite corner touches VP. Draw its projections.   14M

OR

2. A pentagonal lamina of sides 30 mm, rests on HP on one of its sides such that the surface is inclined at 40^0 to HP. The edge on which it rests is inclined at 30^0 to VP. Draw its projections.   14M

UNIT–II

3. a) Draw the projections of a hexagonal prism of base 30 mm and axis 60 mm long. It is resting on HP with axis inclined at 30^0 to HP and parallel to VP.   7M

   b) Draw the projections of a cone of base diameter 50 mm and axis 60 mm long resting on one of its slant generators on HP.   7M

OR

4. A square prism of base side 30 mm and axis height of 60 mm rests on one of its base sides on HP. The axis is inclined at 40^0 HP and 30^0 to VP. Draw its projections.   14M

UNIT–III

5. Draw the isometric projections of the following:
   i. A hexagonal lamina of sides 30 mm in vertical position   7M
   ii. A circle of diameter 50 mm in horizontal position.   7M
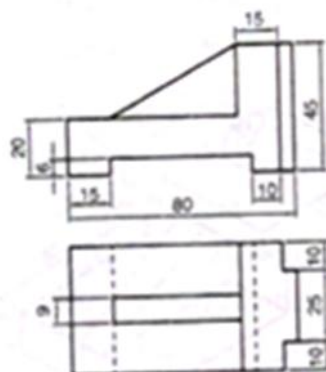
OR

6. Draw the isometric projection of a cylinder of diameters 50 and height 60 mm lying in Horizontal position with axis parallel to HP and VP.   14M
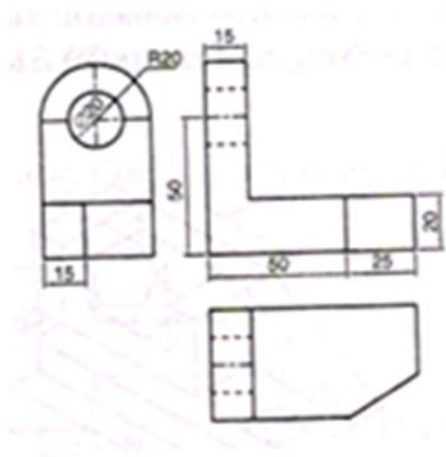
UNIT–IV

7. Draw the isometric view of the figure given below:
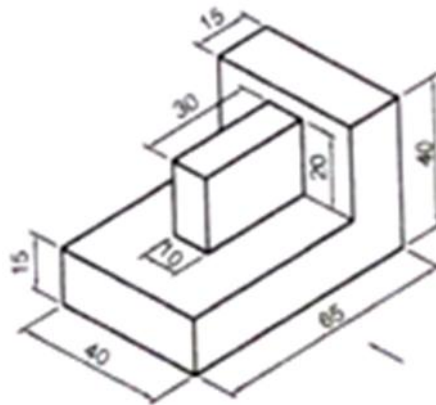

                                                                               14M

OR

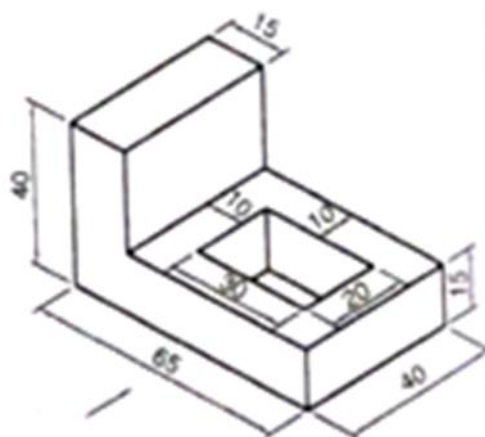8. Draw the isometric view of The figure given below:

14M

UNIT–V

9. Draw the orthographic views of the following figure:

14M

OR

10. Draw the orthographic views of the following figure:

14M

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I B.Tech. II Semester Supplementary Examinations Nov/Dec 2016
Technical English
(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) What is Modern Technology and how it is useful for easy administration? 7M

   b) Explain the difference between production of mass and mass production' 7M

OR

2. a) Explain the disadvantages of technology in about 50 words. 7M

   b) Complete the sentences as directed.
   i) She is a qualified candidate. (Write the antonym of the italicized word)
   ii) Amni took an advantage (write the synonym of the bold word)
   iii) Ravi received a ___ from his professor (fill in the blank with 'complement' / 'compliment')
   iv) The fare of the ticket is not _____.(fill in the blank with a homonym of fare)
   v) Ashu __ the children to be doctors. (Fill in the blank with suitable phrasal verb)
   vi) The principal _____ a speech (gave/made).(Choose the right verb)
   vii) Turn left to _____ your actual place.(imagine and fill with prefix word) 7M

UNIT–II

3. a) Describe four pollution effects on climate in recent times. 7M

   b) What is low pressure? How does it effect on climate? 7M

OR

4. a) How would Lanina effect on climate? Write the expected rainfall in near future. 7M

   b) Suggest few points to protect the climate. 7M

UNIT–III

5. a) Write a resume for the post of Lab Assistant in an Engineering college 7M

   b) What are Photovoltaic panels?-Explain how it works. 7M

OR

6. a) Compare between solar power and power generated by water. 7M

   b) Rewrite the following sentences as directed.
   i) He is irregular. He failed in the examination (Change into simple sentence)
   ii) Though he poor, he is honest. (Change into compound sentence)
   iii) He switched _____ (of/off) the fan.
   iv) Sukruti _____ (rises/raises) doubts in my class.
   v) The labour handed over _____ (bond/bound) to the owner.
   vi) The Governer _____ (proceed/precede) on the dais.
   vii) I bought a _____ (teak/take) wood for the door frames. 7M

UNIT–IV

7. a) Write the effects on human beings that caused by water pollution. 7M

   b) Why do plastic covers remain in soil even after many years? 7M

OR

8. a) What are the methods to generate power form water? 7M

   b) Write a newspaper report on an accident that you have seen. 7M

UNIT–V

9. a) Write an essay on 'The Secret of Work in about 150 words. 10M

   b) What did you know from the essay 'unattached'? 4M

OR

10. a) Write in detail about the 'nature of work' that depends on human spirit. 10M

    b) Fill in the blanks with suitable connotations.

      i) He is _____ (weak/dull) to get at least pass marks.
      ii) They are _____ (forced/pushed) to get rid of hurdles.
      iii) The _____ is hiked (prize/price)
      iv) She followed _____ (Principle/principal) in her life. 4M

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R-15

Code: 5GC25

I B.Tech. II Semester Supplementary Examinations Nov/Dec 2016
Mathematical Methods –II
(Common to 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) Derive the normal equation to fit a parabola $y = a + bx + cx^2$.   7M

   b) Fit straight line $y = a + bx$ from the following data: 7M

x	0	1	2	3	4
y	1	1.8	3.3	4.5	6.3

OR

2. a) Fit a curve of the form $y = a + bx + cx^2$ for the following data.   7M

x	10	15	20	25	30	35
y	35.3	32.4	29.2	26.1	23.2	20.5

   b) Fit the straight line to the form $y = a(b)^x$ for the following data by the method of least squares.   7M

x	2	3	4	5	6
y	8.3	15.4	33.1	64.2	127.4

UNIT–II

3. a) Using Taylor series method, find an approximate value of *y* at $x = 0.2$ for the differential equation $y' - 2y = 3e^x$, $y(0) = 0$.   7M

   b) Use Milne's method to find $y(0.3)$ from $y' = x^2 + y^2$, $y(0) = 1$. Find the initial value of $y(-0.1)$, $y(0.1)$ and $y(0.2)$ from Taylor's series method.   7M

OR

4. a) Using Euler's method solve for *y* at $x = 2$ from $\frac{dy}{dx} = 3x^2 + 1, y(1) = 2$, taking step size (**i**) $h = 0.5$ and (**ii**) $h\ 0.25$.   7M

   b) Use Runge-Kutta method to evaluate $y(0.1)$ and $y(0.2)$ given that $y' = x + y$, $y(0) = 1$.   7M

UNIT–III

5. a) Expand $f(x) = \cos x$, $0 < x < \pi$ in half range sine series.   7M

   b) Define periodic function and find the Fourier expansion of $f(x) = x - x^2$, $-1 < x < 1$.   7M

OR

6. a) Obtain the Fourier cosine series for $f(x) = x \sin x$, $0 < x < \pi$.   7M

      If $f(x) = |x|$, expand $f(x)$ as a Fourier series in the interval $(-2, 2)$.   7M

UNIT–IV

UNIT–I

7. a) Show that $F\{x^n f(x)\} = (-i)^n \frac{d^n}{dp^n} [F(p)]$.   7M

   b) Show that the fourier transform of $f(x) = \begin{cases} a - |x| & for\ |x| < a \\ 0 & for\ |x| > a > 0 \end{cases}$ is $\sqrt{\frac{2}{\pi}}$

   $\left(\frac{1-\cos as}{s^2}\right)$. Hence deduce that $\int_0^\infty \left(\frac{\sin t}{t}\right)^2 = \frac{f}{2}$.   7M

OR

8. a) Find the Fourier transform of $e^{-\frac{x^2}{2}}$ by finding the Fourier transform of $e^{-a^2 x^2}$ ($a > 0$).   7M

   b) Find the finite Fourier cosine transform of $f(x)$ defined by $f(x) = \frac{\pi}{3} - x + \frac{x^2}{2\pi}$, where $0 < x < \pi$.   7M

UNIT–V

9. a) Solve the partial differential equation $z(p^2 - q^2) = x - y$.   7M

   b) Solve by the method of separation of variables $u_x = 2u_t + u$ where $u(x, 0) = 6e^{-3x}$.   7M

OR

10. a) Solve the partial differential equation $p^2 z^2 \sin^2 x + q^2 z^2 \cos^2 y = 1$.   7M

    b) Solve by the method of separation of variables $2xz_x - 3yz_y = 0$.   7M

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I B.Tech. II Semester Supplementary Examinations Nov/Dec 2016
Engineering Chemistry
(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) Comment on impurities of water and mention the units of hardness in detail. 7M
    b) Calculate the temporary and permanent hardness of water sample containing $Mg(HCO_3)_2$=7.3mg/L, $Ca(HCO_3)_2$=16.2mg/L, $MgCl_2$= 9.5mg/L, $CaSO_4$=13.6mg/L) 7M

OR

2. a) Write any two internal treatment methods for industrial water purification. 7M
    b) Explain Ion-Exchange process in detail. 7M

UNIT–II

3. a) What are fuel cells? Write the working procedure for H_2-O_2 fuel cell 7M
    b) Write a note on lead-acid batteries with chemical reactions involving. 7M

OR

4. a) Explain any two methods for prevention of corrosions. 7M
    b) Explain the factors which effect the corrosion. 7M

UNIT–III

5. a) Write the engineering applications of Bakelite and nylon-6,6. 7M
    b) Explain the preparation, properties and applications of Buna-N rubber. 7M

OR

6. a) Write the synthesis and applications of polyacetylene and polyanline. 7M
    b) Comment on the role of biodegradable polymers in present scenario. 7M

UNIT–IV

7. a) Determine the calorific value of a fuel by using bomb calorimeter. 7M
    b) Write a note on synthesis of petrol from Fischer Tropsch's synthesis. 7M

OR

8. a) What is power alcohol? Mention the advantages and disadvantages of power alcohol. 7M
    b) Comment on the following
       i) Producer gas   **ii**) Water gas   **iii**) Biogas 7M

UNIT–V

9. a) What is the composition of Portland cement? Explain setting and hardening of it 7M
    b) Comment on refractories 7M

OR

10. a) What are the properties of lubricants? Explain the theory of lubrication. 7M
    b) Write any seven applications of refractories. 7M

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I B.Tech. II Semester Regular Examinations June 2016
Engineering Mathematics-II
(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. Changing the order of integration evaluate the double integral $\iint_R e^{x^2} dx dy$, where the region R is given by R: $2y \le x \le 2$ and $0 \le y \le 1$.   14M

OR

2. Evaluate the integral $\iint_R \sqrt{x^2 + y^2} dx dy$ by changing into polar coordinates, where R is the region in the xy plane bounded by the circles $x^2 + y^2 = 4$ *and* $x^2 + y^2 = 9$.   14M

UNIT–II

3. a) Find $L^{-1}\left[\dfrac{5s^2 + 3s - 16}{(s-1)(s-2)(s+3)}\right]$ 7M

    b) Find $L^{-1}\left[\dfrac{6+s}{s^2 + 6s + 13}\right]$ 7M

OR

4. Find the Laplace transform of the periodic function defined by the triangular wave $f(t) = \begin{cases} t/a, & 0 \le t \le a, \\ \dfrac{2a-t}{a}, & a \le t \le 2a, \end{cases}$ *and* $f(t+2a) = f(t)$.   14M

UNIT–III

5. Find the solution of the initial value problem $y'' + 4y' + 4y = 12t^2 e^{-2t}$, $y(0) = 2$, $y'(0) = 1$.   14M

OR

6. Solve the initial value problem $y'' + 2y' - 3y = 3$, $y(0) = 4$, $y'(0) = -7$.   14M

UNIT–IV

7. Find the directional derivative of $f(x, y) = x^2 y^3 + xy$ at (2,1) in the direction of a unit vector which makes an angle of $f/3$ with x-axis   14M

OR

8. a) Evaluate the line integral of $\overline{V} = x^2\overline{i} - 2y\overline{j} + z^2\overline{k}$ over straight line path form (-1, 2, 3) to (2, 3, 5).   7M

    b) Prove that $div\ curl\ \overline{F} = 0$ 7M

UNIT–V

9. Verify Green's theorem for $\int_C\left[(3x - 8y^2)dx + (4y - 6xy)dy\right]$ where C is the boundary of the region bounded by x=0, y=0 and x+y=1.   14M

OR

10. Verify divergence theorem for $\overline{F} = 4xz\overline{i} - y^2\overline{j} + yz\overline{k}$, taken over the cube bounded by x=0, x=1; y=0, y=1; z=0, z=1.   14M

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R-15

Code: 5GC23

I B.Tech. II Semester Supplementary Examinations Nov/Dec 2016
Engineering Physics
(Common to CE, ME, 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) Explain the Interference due to thin films and draw the conditions for constructive and destructive Interference.   10M

   b) A parallel beam of light of wavelength 5890 A^o is incident on a thin glass plate of refractive index 1.5 such that the angle of refraction in to the plate is 60°. Calculate the smallest thick ness of the glass plate which will appear dark by reflection.   4M

OR

2. a) Describe the construction and working of He-Ne laser with energy level diagram   10M

   b) Derive an expression for numerical aperture of an optical fiber and calculate acceptance angle of an optical fiber if the refractive index of core and cladding are 1.623 and 1.522 respectively.   4M

UNIT–II

3. a) What are the miller indices? How they are obtained?   4M

   b) Describe the powder method of determination of crystal system.   7M

   c) Copper has fcc structure and the atomic radius is 0.1278 nm. Calculate the inter planar spacing of (110) and (212) planes.   3M

OR

4. a) What are the properties of Ultrasonics? How do you produce Ultrasonics by Piezo electric oscillator method   10M

   b) Calculate the frequency of the fundamental note emitted by Piezo-electric crystal. Use the following data:

   vibrating length = 3mm, Youngs modulus = 8×10^{10} N/m^2 and density of the crystal= 2.5 gm/cm^3.   4M

UNIT–III

5. a) Give an account of Heisenberg's uncertainty principle. Outline an idealized experiment to bring out its significance.   10M

   b) Write down the Schrodinger time independent wave equation for matter waves. Calculate energy levels of a particle confined in an infinite potential well.   4M

OR

6. a) Discuss the Kronig-Penny model for the motion of an electron in a periodic potential.   10M

   b) Find the relaxation time of conduction electrons in a metal of resistivity 1.54×10^{-4} Ohm-m, if the metal has 5.8×10^{28} conduction electrons per m^3 4M

| UNIT–IV |

7. a) Write the principle, working of the P-N junction diode.   7M
    b) Explain the construction and working of
       (i) LED
       (ii) Photo diode   7M

<p align="center">**OR**</p>

8. a) Define Magnetic moment. Explain the origin of magnetic moment at the atomic field.   5M
    b) Write short notes on
       (i) Ferromagnetic materials
       (ii) Ferrites.   6M
    c) What are the applications of Ferrites   3M

| UNIT–V |

9. a) What are cooper pairs? How they produce super conductivity in materials.   5M
    b) Explain Type I and Type II super conductors   5M
    c) The Transition temperature for lead is 8.7 K. The maximum critical field for the material is 6×10^5 A/m. Lead has to be used as a super conductor subjected to a magnetic field of 3×10^6 A/m   4M

<p align="center">**OR**</p>

10. a) Write the properties of Carbon nanotubes   8M
    b) Write any four applications of Nanomaterials   6M

I B.Tech. II Semester Supplementary Examinations Nov/Dec 2016
C Programming and Data Structures
(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) Differentiate Structures and Union.   5M
    b) Write a C program to sort list of strings using pointers.   9M

OR

2. a) Write about command line arguments in C.   7M
    b) Write a program to copy the contents of one file to another file using command line argument.   7M

UNIT–II

3. a) Write a C program to maintain a record of n students with four fields (Roll no, name, marks and grade). Print the marks of the student given the student name as input.   7M
    b) What is a structure? Explain the syntax of Structure declaration with example.   7M

OR

4. a) Explain Merge Sort with the help of an example.   7M
    b) Write an algorithm for Merge Sort and give the time complexity.   7M

UNIT–III

5. Explain the complete mechanism of infix to postfix conversion using stacks.   14M

OR

6. Explain in detail basic operations of queue.   14M

UNIT–IV

7. Write a C program to insert and delete an element in a linear linked list   14M

OR

8. a) Write a C program to count the number of node in a given list.   7M
    b) Write a C program to invert a given list.   7M

UNIT–V

9. Write a C program to delete an element from a binary search tree.   14M

OR

10. a) Write a C program to insert an element in a Binary search Tree.   7M
    b) Define Graph and explain various graph representations.   7M

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