Code: 5GC21

I B.Tech. II Semester Regular Examinations June 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) Do you believe that Modern Technology made human being lazy?   7M
    b) Write in your own words on 'Mass Production'   7M

OR

2. a) Explain the advantages of Technology in about 50 words.   7M
    b) Complete the sentences as directed.
        i) He *unfolded* his full hand shirt in the exam hall. (write the antonym of the italicized word)
        ii) He is a great **patriot**. (write the synonym of the bold word)
        iii) She went to ___ shop to buy a pen.(fill in the blank with 'stationary' / 'stationery')
        iv) He accepted the gift _____ money.(fill in the blank with a homonym of accept)
        v) Kanhayya _____ the strike at Delhi. (Fill in the blank with suitable phrasal verb)
        vi) The students are ___ (listening/hearing) a tractor noise.(Choose the right verb)
        vii) I have to attend ____ exam before final exam.(imagine and fill with prefix word)   7M

UNIT–II

3. a) Suggest few responsibilities to save climate from radiation.   7M
    b) What is low pressure? How does it effect on climate?   7M

OR

4. a) Write with examples of the factors that cause climate change.   7M
    b) What is Elnino and Lanina? Explain the condition of recent times.   7M

UNIT–III

5. a) In response to an advertisement, write a cover letter, possessed basic qualification of B.Tech., to Soft Tech Software Company for the position of Project Manager.   7M
    b) What are Photovoltaic panels?-Explain how it works.   7M

OR

6. a) Why top countries use solar power? What are the benefits by using solar panels?   7M
    b) Rewrite the following sentences as directed.
        i) I saw an angry tiger in the zoo. (Change into complex sentence)
        ii) In spite of his poverty, he couldn't pay fee. (Change into compound sentence)
        iii) What is the _____ (fair/fare) of shatavahana express ticket from here?
        iv) I _____ (alter/altar) my class due to busy schedule.
        v) I _____ (waist/waste) my money on movies.
        vi) The passengers are _____ (weighing/waiting) for the luggage.
        vii) He took a _____ (break/brake) for rest for a while.   7M

UNIT–IV

7. a) Write on 'water pollution' that caused by factory chemicals.   7M

    b) What kind of measures to prevent soil erosion?   7M

OR

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

    b) Keeping in view of Raman's, how can we prevent wastage of water?   7M

UNIT–V

9. a) Spiritual knowledge is the only thing that can destroy our miseries for ever-Explain. 10M

    b) Write an essay that tells us about 'unattached'.   4M

OR

10. a) Define 'nature of work' in about 5O words.   10M

    b) Fill in the blanks with suitable connotations.

    i) He is _____ (handicapped/disabled) to listen music.
    ii) Her _____ (childish/childlike) mentality irritates everyone.
    iii) The flight ticket to Mumbai is _____ (cheap/economical)
    iv) She is very _____ (curious/interest) to ask doubts.   4M

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I B.Tech. II Semester Regular Examinations May/June 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) Write a short not on Population inversion. What is meant by Direct and In direct Band gap semiconductors?   7M   6 m
   b) Describe the construction and working of semiconducting Laser?   7M

OR

2. a) Derive the expressions for the numerical aperture and fractional index change of an Optical fiber. Explain how the optical fibers are classified.   10M
   b) Calculate the fractional change for a given optical fiber if the refractive indices if the core and cladding are 1.563 and 1.498 respectively.   4M

UNIT–II

3. a) Explain the principle, procedure and advantage of Powder method of X-ray diffraction.   10M
   b) A beam of X-rays is incident on a NaCl crystal with lattice spacing 0.282 nm. Calculate the wavelength of X- rays if the first order Bragg reflection takes place at a glancing angle of 8° 35'.   4M

OR

4. a) Write the properties of Ultrasonics and explain how do you produce Ultrasonics by piezoelectric method with a neat sketch.   10M
   b) Write the applications of Ultrasonics in non- destructive testing.   4M

UNIT–III

5. a) Give an account of Heisenberg's uncertainty principle and explain the outline an idealized experiment to bring out its significance.   7M
   b) Derive the Schrodinger time independent wave equation for matter waves.   7M   8 m

OR

6. a) What are the failures classical free electron theory   4M
   b) Discuss the Kronig-Penny model for the motion of an electron in a periodic potential.   10M

UNIT–IV

7. a) Distinguish between intrinsic and extrinsic semiconductors.   4M
   b) Define and explain the Hall effect with a neat sketch. Derive the expression for the hall coefficient.   10M

OR

8. a) Explain the origin of magnetic moment in magnetic materials and detail the classification of magnetic materials.   7M
   b) Discuss with help of a neat diagram, the hysteresis loop observed in ferromagnetic material.   7M

UNIT–V

9. a) Explain
   (i) Critical Magnetic field (H_c)
   (ii) Messiner effect
   (iii) Phenomenon of BCS theory.   10M
   b) A lead super conductor with T_c =7.2 K has a critical magnetic field of 6.5x10^3 A/m at absolute zero. What would be magnitude of critical magnetic field at   5 K temperature?   4M

OR

10. a) Discuss the detailed procedure to synthesize the nanomaterials using SOL-GEL method using a flow chart.   10M
    b) Discuss about applications of nanomaterials in the field of energy and environment.   4M

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Code : 5GC12

R-15

I B.Tech. I Semester Supplementary Examinations May/June 2016
Engineering Chemistry
(Common to CE, ME, CSE & 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) How is hard water estimated by EDTA method? From the following results calculate the total hardness of water sample and express the hardness of water in ppm. 50 ml of water required 14 ml of 0.05 M EDTA. (1000 ml of 1 M EDTA = 100 gms of $CaCO_3$)   7M

    b) With the help of neat diagram, describe the reverse osmosis method for the desalination of brackish water.   7M

OR

2. a) Describe the ion-exchange process of softening for water.   7M

    b) Write a short note on
    (i) Break point chlorination,
    (ii) Calgon conditioning.   7M

UNIT–II

3. a) Discuss the various factors affecting the rate of corrosion.   7M

    b) What are potentiometric sensors? Describe the analysis of urea by using electrochemical sensors.   7M

OR

4. a) Explain the composition, applications and advantages of the following cells. (i) Ni-Cd cell & (ii) Lithium ion cell.   7M

    b) Define corrosion. Explain dry corrosion and its mechanism.   7M

UNIT–III

5. a) Explain the synthesis of conducting polymers with examples.   7M

    b) What are silicones? Draw the structure of siloxane polymer obtained by hydrolyzing dichlorodimethylsilane.   7M

OR

6.   Describe the methods of preparations, properties and applications of the following:
    (i)   Bakelite,
    (ii)   Buna-S,
    (iii)   Nylon-6,6 &
    (iv)   PVC   14M

UNIT–IV

7. a) Describe the determination of calorific value of solid fuel using bomb calorimeter. 7M

   b) The percentage composition of a sample of coal by weight was found to be: C = 76%, H = 5.2%, O = 12.8%, N = 2.7%, S = 1.2%, the remaining being ash. Calculate the minimum (**i**) Weight and (**ii**) volume at NTP of air necessary for complete combustion of 1 kg of coal and percentage composition by weight of dry products, if 50% excess air supplied. 7M

OR

8. a) Describe the Otto Hoffmann's method of manufacture of metallurgical coke with a neat labeled diagram 7M

   b) Write a note on Production and uses of Producer gas and Biogas. 7M

UNIT–V

9. a) What are refractories? Discuss any three properties of refractories. 7M

   b) Explain theory of lubricants. Write any three applications of lubricants. 7M

OR

10. a) How can you classify the rocket propellants? What are the characteristics requires for good propellants. 7M

    b) What is Portland cement? Explain hardening and setting of cement with various reactions involved in that process. 7M

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R-15

Code: 5G523C

I B.Tech. II Semester Regular Examinations May/June 2016
Engineering Drawing- II
(Common to CSE & 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 pentagonal plate of sides 30 mm is resting on HP on one of its sides which is parallel to both HP and VP. The surface of lamina is inclined at 40^0 to HP. Draw its projections.   14M

OR

2. A square lamina of sides 40 mm appears to be a rectangle of sides 40 mm X 20 mm in its top view. Draw the projections of the lamina if the longer sides of the rectangle is parallel to both planes.   14M

UNIT–II

3. a) Draw the projections of a cylinder of base 30 mm and axis 60 mm long. It is resting on HP with axis inclined at 45^0 to HP and parallel to VP.   7M

   b) Draw the projections of a square pyramid of base 30 mm and axis 60 mm long resting on one of its slant surfaces on HP.   7M

OR

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

UNIT–III

5. Draw the isometric projections of the following:
   i) A hexagonal lamina of sides 40 mm in horizontal position   7M
   ii) A circle of diameter 40 mm in vertical position   7M

OR

6. Draw the isometric projection of a frustum of a cone of diameters 60 mm and 30 mm and height 60 mm resting on HP on its bigger base.   14M

UNIT–IV

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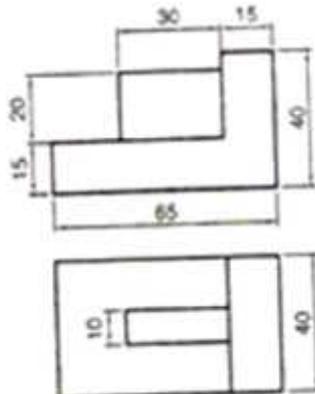

14M

OR

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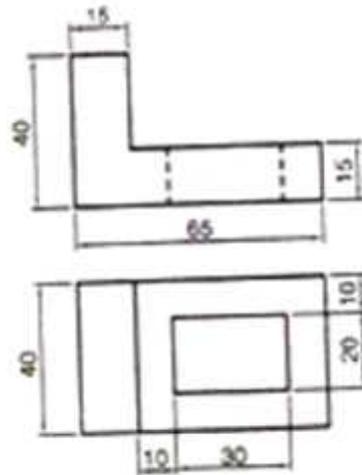

14M

UNIT–V

9   Draw the orthographic view of the following figure:
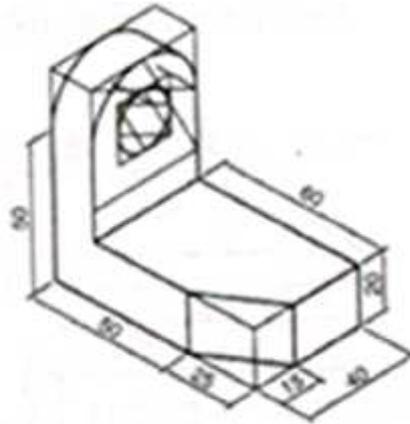
14M

OR

10   Draw the orthographic view of the following figure:

14M

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Code: 5GC24

R-15
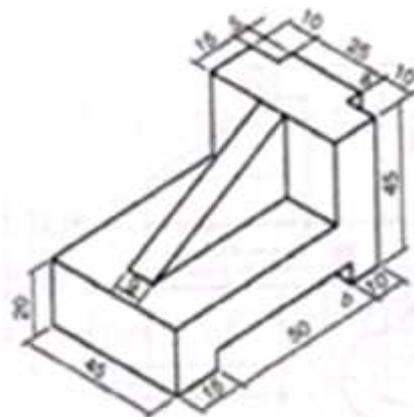
I B.Tech. II Semester Regular Examinations May/June 2016
Engineering Mathematics-II
(Common to All Branches)

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. Evaluate the double integral $\iint_R xy\,dxdy,$ where R is the region bounded by

   the x-axis, the line y=2x and the parabola $y = \dfrac{x^2}{4a}$ 14M

OR

2. Evaluate $\iint_R (x+y)^2\,dxdy$, where R is the parallelogram in the xy-plane with

   vertices (1,0), (3,1), (2,2), (0,1) using the transformation u=x+y and v=x-2y   14M

| UNIT–II |

3. Find the Laplace transform of the periodic function defined by the saw
   tooth wave $f(t) = t, \quad 0 \le t \le a, \quad f(t+a) = f(t).$ 14M

OR

4. Find the inverse Laplace transform of the following functions

   a) $\dfrac{2(s+1)}{(s^2+2s+2)^2}$ **b)** $\log\left(\dfrac{s+c}{s+d}\right)$ where c, d are constants.

                                                                                                                              14M

| UNIT–III |

5. Find the solution of the initial value problem $y'' + 4y' + 13y = e^{-t}$,
   $y(0) = 0, \; y'(0) = 2.$ 14M

OR

6. Using convolution, solve the initial value problem $y'' + 9y = \sin 3t$,
   $y(0) = 0, \; y'(0) = 0.$ 14M

| UNIT–IV |

7. a) Find $div\overline{F}$ and $curl\overline{F}$ where $\overline{F} = grad(x^3 + y^3 + z^3 - 3xyz)$.   7M

   b) Show that $\nabla^2\left(\dfrac{1}{r}\right) = 0$.

                                                                                                                                7M

OR

8. Show that the vector field $\overline{F} = 2x(y^2 + z^3)\overline{i} + 2x^2 y\overline{j} + 3x^2 z^2\overline{k}$ is conservative.
   Find its scalar potential and the work done in moving a particle from
   (-1, 2, 1) to (2, 3, 4).   14M

| UNIT–V |

9. Verify Green's theorem for $\int_C \left[\left(xy + y^2\right)dx + x^2 dy\right]$ where C is bounded by

   y=x and y=x².   14M

OR

10. Verify Stoke's theorem for a vector field $\overline{F} = (2x - y)\overline{i} - yz^2\overline{j} - y^2 z\overline{k}$ over the

    upper half surface of $x^2 + y^2 + z^2 = 1,$ bounded by its projection on the xy-plane.   14M

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Code: 5GC25

I B.Tech. II Semester Regular Examinations May/June 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) Find the parabola of the form $a + bx + cx^2$ which fits most closely with the observations

x	-3	-2	-1	0	1	2	3
y	4.63	2.11	0.67	0.09	0.63	2.15	4.58

7M

   b) Estimate y at x = 2.25 by fitting an indifference curve of the form $ay = ax + b$ to the following data

x	1	2	3	4
y	3	1.5	6	7.5

7M

OR

2. a) Fit a parabola to the following data points in the table:

x	0	1	2	3	4
y	1	1.8	1.3	2.5	6.3

7M

   b) Find a least squares straight line to the following data:

x	0	1	3	6	8
y	1	3	2	5	4

7M

UNIT–II

3. Using Taylor's series method solve the initial value problem

$\dfrac{dy}{dx} = x - y$, y(0) = 1 at x = 0.2, 0.2, 0.3 and compare the value with the exact solution.   14M

OR

4. Solve the initial value problem $y' = -2xy^2$, y(0) = 1 with h = 0.2 on the interval [0, 0.4] using Runge-Kutta fourth order method. Compare the result with the exact solution.   14M

UNIT–III

5. a) Obtain the Fourier series of $f(x) = \cos \alpha x$, in (0, 2π) (α ∉ Z).   7M

   b) Find the Fourier series expantion for $f(x) = ax + bx^2$ in (-l, l)?   7M

OR

6. A sinusoidal voltage *E sin wt* is passed through a half-wave rectifier which clips the relative portion of the wave. Develop a Fourier series for the resulting period function.

$$U(t) = \begin{cases} 0, when -\frac{T}{2} < t < 0 \\ E\ sin\ wt, when\ 0 < t < \frac{T}{2}\ where\ T = \frac{2\pi}{w} \end{cases}$$

14M

UNIT–IV

7. a) Find the Fourier cosine transform of $f(x) = 1/(1 + x^2)$. Hence derive the

   Fourier sine transform of $\phi(x) = \dfrac{x}{1+x^2}$.   7M

   b) Find the Fourier sine and cosine transform of e^{-ax} $(a > 0)$ and deduce the
   inverse formula.   7M

<div align="center">OR</div>

8. a) Show that the Fourier transform of $e^{-\frac{x^2}{2}}$ is reciprocal.   7M

   b) Find the Fourier sine transform of $\left(\dfrac{1}{x}\right)(x^2 + a^2)$?   7M

UNIT–V

9. a) Solve $\dfrac{\partial^2 z}{\partial x^2} - a^2 z = 0$ if $\dfrac{\partial z}{\partial x} = \sin y$ and $\dfrac{\partial z}{\partial y} = 0$ when $x = 0$.   7M

   b) Solve $(\sec x)p + (\sin x - y \sec x \tan x)q = (a^2 - z^2)$.   7M

<div align="center">OR</div>

10. a) Form the partial differential equation for $f(xy + z^2, x + y + z) = 0$ 7M

   b) Solve $\dfrac{\partial^2 u}{\partial x^2} = \dfrac{\partial u}{\partial y} + 2u$ subject to conditions, $u = 0$, $\dfrac{\partial u}{\partial x} = 1 + e^{-3y}$ when $x = 0$.   7M

<div align="center">***</div>

I B.Tech. II Semester Regular Examinations May/June 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)
****

UNIT–I

1. a) What is meant by a pointer? Explain about pointer to array.   7M

    b) Write a C program to sort element in an array using pointer to array.   7M

OR

2. a) What do you mean by dynamic memory allocation?   7M

    b) Discuss the different dynamic memory allocation functions available in c.   7M

UNIT–II

3. a) Explain file handling functions with syntax.   7M

    b) Write a C program to count the number of occurrences of a key word in an
        input program.   7M

OR

4. a) Explain Quick sort with the help of an example?   7M

    b) Write a C program to sort the elements using Quicksort.   7M

UNIT–III

5. a) Explain stack with basic Operations (push and pop).   9M

    b) Convert the following infix expression into Postfix Expression
        A+B*C/D^E+(F+G)*H   5M

OR

6.   Write an algorithm to insert and delete an element in a circular Queue.   14M

UNIT–IV

7. a) Write a C program to search an element in a list using linked list.   7M

    b) Write a C program to concatenate two linked lists.   7M

OR

8.   Writ a C program to insert and delete an element in a given list using double
        linked list.   14M

UNIT–V

9. a) Define binary tree, complete binary tree and almost complete binary tree. 7M

    b) Explain various traversal techniques in a binary search tree   7M

OR

10. a) Consider the set S= {15, 20, -4, 28, 2, 6, 9}, Draw the binary search tree T by
        taking keys in set S one at a time in the order assume the binary search tree is
        initially empty.   7M

    b) Write a recursive algorithm to search the element in a binary search tree. 7M

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