Hall Ticket Number :										

Code: 5GC21

R-15

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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Hall Ticket Number :										

Code: 5GC23

R-15

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
   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^o 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

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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Hall Ticket Number :										

Code: 5G523b

R-15

I B.Tech. II Semester Regular Examinations May/June 2016

Engineering Drawing-II

(Electrical & Electronics Engineering)

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. Draw the projections of the circle of 50 mm diameter resting in the H.P on a point A on the circumference, its plane inclined at 45^0 to the H.P and the diameter AB making 30^0 angle with the V.P. 14M

OR

2. A square plate PQRS of negligible thickness having 35 mm side is lying on a corner R on H.P. One of the diagonals RP is inclined at 35^0 to H.P and 40^0 to V.P. The two sides QR and RS containing the corner R are equally inclined with H.P. Draw its projections. 14M

UNIT–II

3. Draw the projections of a cylinder 75mm diameter and 100 mm long, lying on the ground with its axis inclined at 30^0 to the V.P and parallel to the ground. 14M

OR

4. Draw the projections of a cone, base 75 mm diameter and axis 100 mm long, lying on the H.P on one of its generators with the axis parallel to the V.P. 14M

UNIT–III

5. A square prism, with the side of its base 40 mm and axis 70 mm long is lying on one of its base edges on the H.P. in such a way that this base edge makes an angle of 45^0 with the V.P. and the axis is inclined at 30^0 to the H.P. Draw its projections. 14M

OR

6. A right circular cone, 40 mm base diameter and 60 mm long axis is resting on H.P on one point of base circle such that its axis makes 45^0 inclination with H.P and 40^0 inclination with V.P. Draw the projections of the cone. 14M

UNIT–IV

7. Draw the isometric view of a pentagonal prism, side of base 30mm and height 60mm, lying on one of its rectangular face with its axis perpendicular to VP. 14M

OR

8. A cylindrical block of base, 60mm diameter and height 90mm, is standing on the HP with its axis perpendicular to HP. Draw its isometric view. 14M

UNIT–V

9. Draw the isometric view of Fig.1:

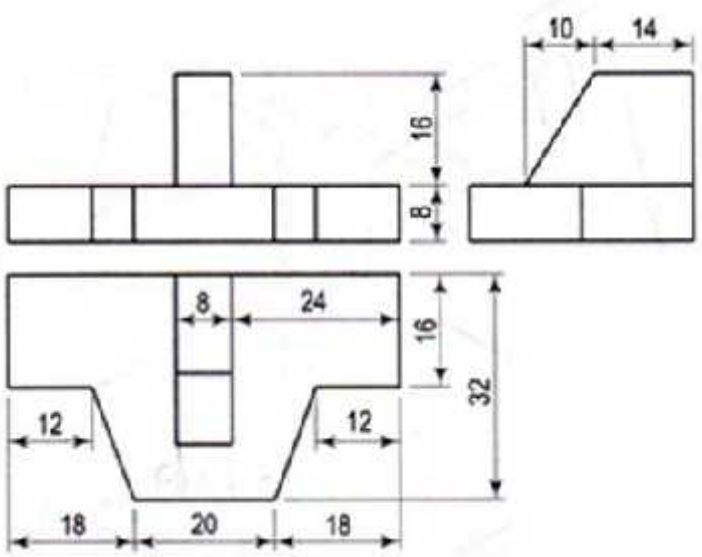

Fig. 1.

Note: All dimensions are in mm. 14M

OR

10. Draw (i) Front view (ii) Side view from the right of Fig: 2

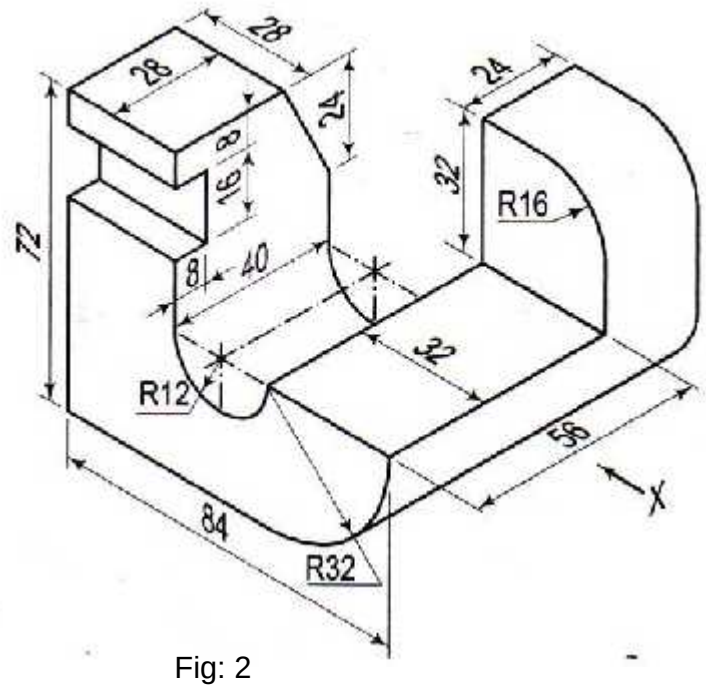

Fig: 2

Note: All dimensions are in mm. 14M

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Hall Ticket Number :										

Code: 5G321

R-15

I B.Tech. II Semester Regular Examinations June 2016

Electronic Devices and Circuits-II

(Common to EEE & 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) Draw a BJT fixed bias circuit and derive the expression for the stability factor S. 8M
   b) Differentiate stabilization and compensation techniques. 6M

OR

2. The h-parameters of a transistor used in a CE circuit are hie = 1K Ω, hre = 10x10-4, hfe = 50, hoe = 100 Kʊ. The load resistance for the transistor is 1 K Ω in the collector circuit. Determine Ri, Ro, AV and AI in the amplifier stage (Assume Rs = 1000 Ω). 14M

UNIT–II

3. a) Write short notes on different types of FET biasing? 7M
   b) Explain how the JFET is used as Voltage controlled device? 7M

OR

4. a) Draw the small signal model of JFET in all configurations. 7M
   b) A self biased p-channel JFET has a pinch-off voltage of vp=5V and IDSS=12mA. The supply voltage is 12v determine the values of RD and RS so that ID=5mA and VDS=6v. 7M

UNIT–III

5. a) How can a DC equivalent circuit of an amplifier be obtained? 6M
   b) Compare the characteristics of the different configurations of BJT amplifiers 8M

OR

6. a) For a CB transistor amplifier driven by a voltage source of internal resistance R_s=1200Ω, the load impedance is a resistor R_L=1000 Ω. The h-parameters are h_{ib}=22 Ω, h_{rb}=3X10^{-4}, h_{fb}=-0.98 and h_{ob}=0.5μA/V. Compute the current gain A_I, The input impedance R_i, Voltage gain A_V, overall voltage gain A_{VS}, Overall current gain A_{IS}, output impedance Z_o, and power gain A_P using exact analysis and approximate analysis. 8M
   b) What are the different types of amplifiers? 6M

UNIT–IV

7. Explain the analysis of low frequency response of RC coupled amplifiers. 14M

OR

8. a) Make complete analysis of single tuned amplifier &derive the necessary expressions. 7M
   b) Compare different types of coupling 7M

UNIT–V

9 a) Write short notes on Schottky Barrier Diode. 7M
   b) With a neat sketch explain the characteristics of SCR. 7M

OR

10. With a neat sketch explain the principle of operation and characteristics of Tunnel Diode. 14M

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Hall Ticket Number :										

Code: 5GC22

R-15

I B.Tech. II Semester Regular Examinations May/June 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 hardness of water and mention any one of the method for estimation of hardness of water. 7M
   b) What are boiler troubles? Write a note on disadvantages of boiler troubles. 7M

OR

2. a) Explain the treatment of saline water by reverse osmosis in detail. 7M
   b) Write any one of the methods for purification of lake water for domestic purpose and comment on break point chlorine. 7M

UNIT–II

3. a) Explain the working principle of primary batteries including chemical reactions. 7M
   b) Describe working procedure of electrochemical sensors with suitable examples. 7M

OR

4. a) Write a note on electrochemical corrosion. 7M
   b) Explain the factors which effect the corrosion. 7M

UNIT–III

5. a) What are polymers? Explain the types of polymerization processes. 7M
   b) Write the differences between thermosetting and thermoplastics. 7M

OR

6. a) Explain the preparation, properties and applications of Buna-S rubber. 7M
   b) Comment on silicones and polyphosphazines. 7M

UNIT–IV

7. a) Explain the classification of fuels and write the characteristics for good fuel 7M
   b) Explain Otto Hoffmann's by product oven process 7M

OR

8. a) Explain the following
      i) Knocking **ii**) Octane number **iii**) Cetane number 7M
   b) Compare the liquid fuels with gaseous fuels. 7M

UNIT–V

9. a) Explain the manufacture of Portland cement. 7M
   b) Comment on theory of lubrication and its applications. 7M

OR

10. a) Write any seven applications of refractories. 7M
    b) Explain the setting and hardening of Portland cement with its chemical reactions. 7M

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Hall Ticket Number :										

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 $y = x^2/4a$ 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) $\frac{2(s+1)}{(s^2+2s+2)^2}$ **b)** $\log\left(\frac{s+c}{s+d}\right)$ 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 $div\bar{F}$ and $curl\bar{F}$ where $\bar{F} = grad(x^3 + y^3 + z^3 - 3xyz)$. 7M

b) Show that $\nabla^2\left(\frac{1}{r}\right) = 0$. 7M

OR

8. Show that the vector field $\bar{F} = 2x(y^2+z^3)\bar{i} + 2x^2y\bar{j} + 3x^2z^2\bar{k}$ 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 $\int_C \left[\left(xy + y^2\right)dx + x^2dy\right]$ where C is bounded by y=x and $y=x^2$. 14M

OR

10. Verify Stoke's theorem for a vector field $\bar{F} = (2x - y)\bar{i} - yz^2\bar{j} - y^2z\bar{k}$ 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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Hall Ticket Number :										

R-15

Code : 5GC13

I B.Tech. I Semester Supplementary Examinations May/June 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) Explain Fraunhofer diffraction of light at single slit and its intensity distribution. 10M
   b) Write about important characteristics of laser. 4M

OR

2. a) Defining the terms obtain expressions for Numerical Aperture and Acceptance Angle of an optical fiber. 9M
   b) With the help of block diagram, explain an optical fiber communication system. 5M

UNIT-II

3. a) Deduce the expression of distance of separation between two successive parallel (hkl) planes in a cubic crystal. 7M
   b) Defining what is meant by defect in crystals, describe various point defects in crystalline solids. 7M

OR

4. a) Write in detail the powder X-ray diffraction method 8M
   b) Explain the applications of ultrasonics in non-destructive testing of materials. 6M

UNIT-III

5. a) State Heisenberg's uncertainity principle. 2M
   b) Applying time independent wave equation solve the case of motion of a particle between two infinite height impenetrable walls and plot probability amplitude and density for the first three allowed states. 12M

OR

6. a) On the basis of free electron theory derive expression for electrical conductivity. 7M
   b) Write about Fermi-Dirac distribution function and its dependence on temperature. 7M

UNIT-IV

7. a) Distinguish between intrinsic and extrinsic semiconductors 4M
   b) What is Hall effect? Derive expression of Hall coefficient in case of p-type semiconductors. 10M

OR

8. a) Plot and explain hysteresis loop in case of ferromagnetic materials. 7M
   b) With examples, discuss classification of magnetic materials into soft and hard magnetic. 7M

UNIT-V

9. a) Define superconductivity and explain with relevant diagrams the effect of temperature and magnetic field on superconductivity 7M
   b) Explain type-I & type-II superconductors 7M

OR

10. a) Explain synthesis of nanomaterials using sol-gel method and discuss its advantages over other methods. 8M
    b) Write about carbon nano tubes and their properties. 6M

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Hall Ticket Number :										

Code: 5G121

R-15

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)

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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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