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 : 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)

****

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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Hall Ticket Number :										

Code: 5G522A

R-15

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

Engineering Graphics -II

(Civil Engineering)

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 hexagonal prism, base 30 mm side and axis 75 mm long, has an edge of the base parallel to the H.P and inclined at 45^0 to the V.P. Its axis makes an angle of 60^0 with the H.P. Draw its projections 14M

OR

2. A square pyramid, base 40 mm side and axis 90 mm long, has a triangular face on the ground and the vertical plane containing the axis makes an angle of 45^0 with the V.P. Draw its projections 14M

UNIT–II

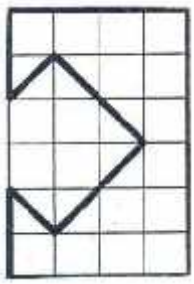
3. A hexagonal prism, has a face on the H.P and the axis parallel to the V.P. It is cut by a vertical section plane, the H.T of which makes an angle of 45^0 with xy and which cuts the axis at a point 20 mm from one of its ends. Draw its sectional front view and the true shape of the section. Side of base 25 mm and height 65 mm 14M

OR

4. A cube of 65 mm long edges has its vertical faces equally inclined to V.P. It is cut by a section plane, perpendicular to the V.P so that the true shape of the section is a regular hexagon. Determine the inclination of the cutting plane with the H.P and draw the sectional top view and true shape of the section 14M

UNIT–III

5 Draw the development of lateral surface of the cylinder with a square hole shown below (Front View) . Assume each grid = 1 sq.cm(i.e dia = 4 cm and axis= 6 cm)



14M

OR

6. A vertical square prism, base 50 mm side is completely penetrated by a horizontal square prism, base 35 mm side so that their axes are bisecting. The axis of the horizontal prism is parallel to the V.P., while the faces of both prisms are equally inclined to the V.P. Draw the projections of the prisms showing lines of intersection 14M

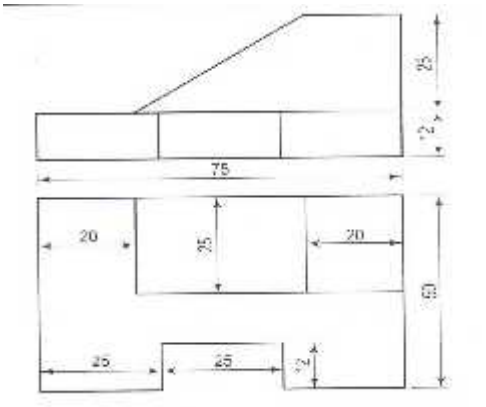
UNIT–IV

7. a) A sphere is placed centrally on top of a cube. Draw the isometric projections of the solids. Cube Side 60 mm sphere dia : 30 mm 7M

   b) Draw the isometric view of the cylinder with the axis horizontal Cylinder Dia 80 mm ,Axis : 90 mm 7M

OR

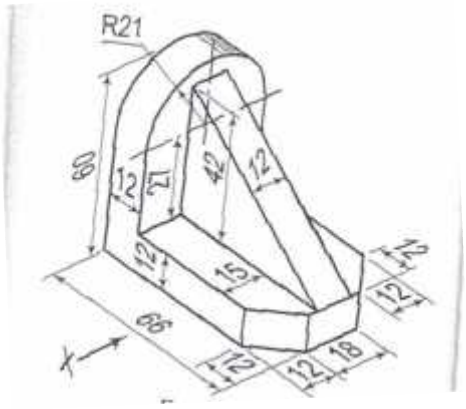
8. Draw the isometric view of the object for which orthographic views are shown below.



14M

UNIT–V

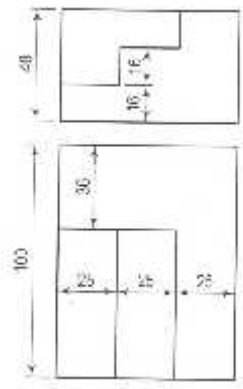
9. Isometric view of an object is shown below. Draw front view, top view and side view



14M

OR

10. Draw the isometric view of the object for which orthographic views are shown below.



14M

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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 :										

Code: 5G521

R-15

I B.Tech. II Semester Regular Examinations June 2016

Engineering Mechanics-Dynamics

(Common to CE and ME)

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) The greatest possible acceleration or deceleration that a train may have is a and its maximum speed is **v**. Find the minimum time in which the train can get from one station to the next, if the total distance is **s**. 7M

   b) A particle under constant deceleration is moving in a straight line and covers a distance of 20 m in first two seconds and 40 m in the next 5 seconds. Calculate the distance it covers in the subsequent 3 seconds and the total distance covered, before it comes to rest. 7M

OR

2. a) An electric train which starts from one station is uniformly accelerated for the first 10 seconds, during which period it covers 150 metres. It then runs with constant speed until it is finally retarded uniformly in the last 40 metres. Calculate the maximum speed and the time taken over the journey to the next stopping station which is 600m form the previous station 7M

   b) A particle is projected with a velocity of 10m/s at an angle of elevation of 60°. Find

   i) The equation of the path of motion.

   ii) The length of latus rectum of the path of motion

   iii) Time required to cover the range.

   iv) The length of range 7M

UNIT–II

3. A flywheel rotating freely at the speed of 1750 rpm clockwise is provided with a counter clockwise torque, which is first applied at time t = 0 producing a counterclockwise acceleration $\alpha = 4.5\ t\ rad/s^2$. Determine the **(i)** time required to produce clockwise angular speed 950 rpm, **(ii)** time required to reverse direction of rotation, **(iii)** total number of revolutions during the first 14 s of movement. 14M

OR

4. A bicycle wheel of 0.89 m diameter rolls without slip at 18 rad/s angular velocity (Fig.1) If the angular acceleration becomes 13 rad/s^2, determine the velocity and the acceleration of point A on the tyre and B on the rim. The rim has diameter 0.78 m

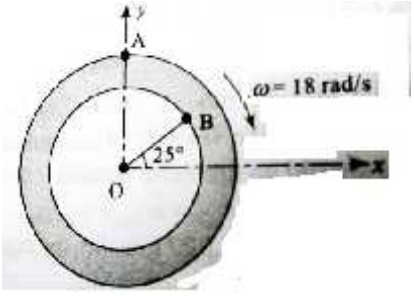

Fig.1 14M

UNIT–III

5. Using D'Alembert's principle, determine the tension in the string and acceleration of blocks A and B weighing 1500 N and 500 N connected by an inextensible string as shown in Fig.2 below. Assume pulleys as frictionless and weightless

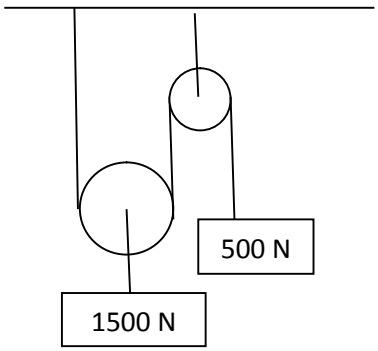

Fig. 2 14M

OR

6. A 750 N crate rests on a 500 N cart. The coefficient of friction between the crate and the cart is 0.3 and Between cart and the road is 0.2. If the cart is to be pulled by a force P such that the crate does not slip. Determine (a) the maximum allowable magnitude of P and (b) the corresponding acceleration of the cart.

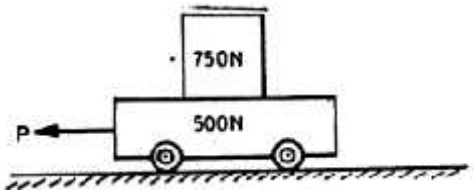

Fig.3. 14M

UNIT–IV

7. Determine the constant force P that will give the system of bodies shown in Fig. 4 A velocity of 3 m/s after moving 4.5 m from rest. Coefficient of friction between the blocks and plane is 0.3. Pulleys are smooth.

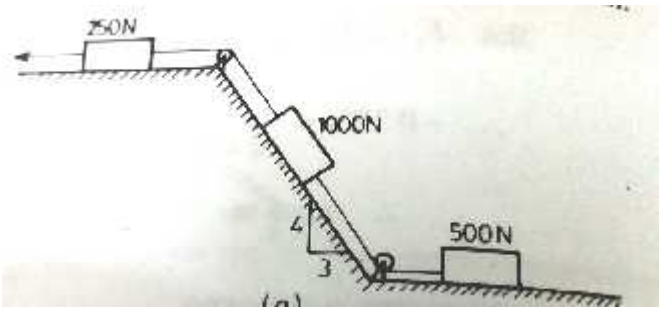

Fig.4 14M

OR

8. A tennis ball strikes a smooth horizontal floor from a height h and is assumed to bounce a finite number of times. Derive the expression for the velocity of the ball after bouncing ***n*** times. Also determine the expression for total vertical distance travelled. 14M

UNIT–V

9. A solid cylinder and a thin hoop of equal mass and radius are connected by a bar C_1C_2 as shown in Fig.5. If the assembly rolls down the incline without slip, determine the acceleration of the assembly and the tension in the bar.

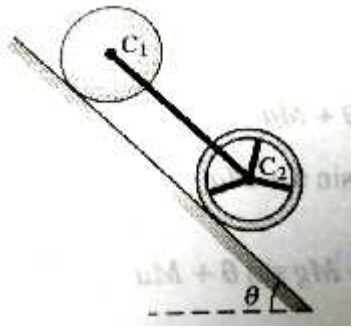

Fig.5

14M

OR

10. A right circular homogeneous cylinder of mass M and diameter d is suspended from an inextensible cord wound around its periphery as shown in Fig. 6. Determine the acceleration of the mass centre C of the cylinder, when it is allowed a free fall. In this condition, what will be tension in the cord?

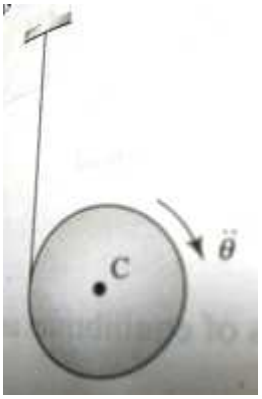

Fig.6 14M

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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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