Code : 1G112

R11

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET

(AUTONOMOUS)

B.Tech I Year Regular Examinations, May/June 2012

C PROGRAMMING AND INTRODUCTION TO DATA STRUCTURES

(Common to EEE, ME and ECE branches)

(For students admitted in 2011-12)

Time: 3 hours **Max Marks: 70**

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Answer any FIVE of the following

All questions carry equal marks

1. Explain the following with an example.
   a) Algorithm.
   b) Flowchart.

2. Write a C Program to calculate the factorial of a given number. Draw the flow chart for the same.

3. Explain different storage classes with examples.

4. Write a C program for calculate the number of occurrences of a given character in a given string.

5. Explain the differences between structure and Union with an example. How to declare structure within a structure.

6. Write a C program to count number of characters in a file.

7. Explain the operations of Queues with an example.

8. Explain Binary search method with an example.

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Code : 1G513b

R11

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET

(AUTONOMOUS)

B.Tech I Year Regular Examinations, May/June 2012

ENGINEERING DRAWING

(Electronics and Communication Engineering)

(For students admitted in 2011-12)

Time: 3 hours **Max Marks: 70**

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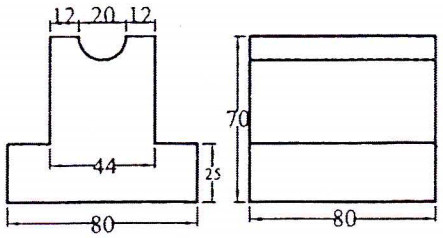
Answer any FIVE of the following

All questions carry equal marks

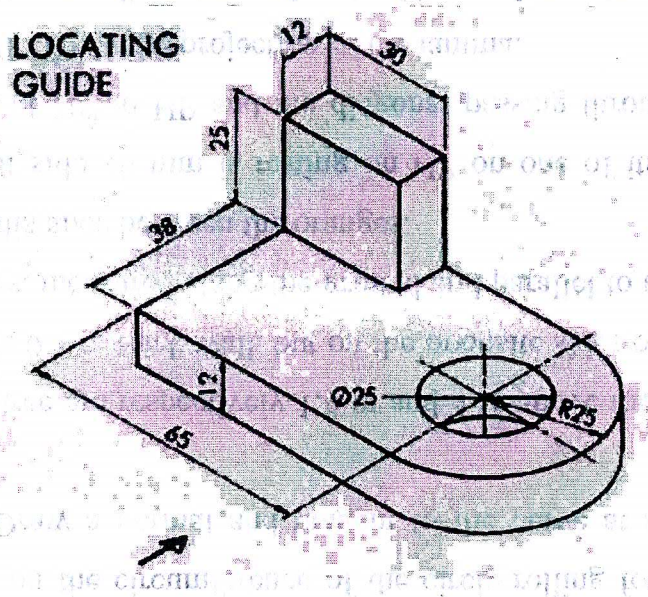
1. A fish pond of elliptical shape is to be inscribed inside a rectangular plot of size 100m X 50m. Draw the boundary line of the fish pond. (Take suitable scale)
2. A circle of 50 mm diameter rolls on a straight line without slipping. Trace the locus of a point P on the circumference of the circle rolling for one revolution. Name the curve. Draw a normal and tangent to the curve at any point on the curve.
3. Two oranges on a tree are respectively 1.8 m and 3 m above the ground, and 1.2 m and 2.1 m from a 0.3 m thick wall, but on the opposite sides of it. The distance between the oranges, measured along the ground and parallel to the wall is 2.7 m. determine the real distance between the oranges.
4. A square lamina of side 40 mm is resting on HP on one of its corners and its surface is inclined at 30^0 to HP and the diagonal passing through the corner is inclined at 40^0 to VP. Draw the projection of the lamina.
5. A cone of base 50 mm diameter and axis 65 mm long lies with one of its generators on HP and axis parallel to VP. Draw its projections.
6. Draw the isometric view of pentagonal prism, with side of base 30 mm and axis 65 mm long. The prism is resting on its base on HP with an edge of the base perpendicular to VP.

7. Draw the isometric view of an object using the details that are shown in the following figure.



Front View Side View

8. Draw the front, top and side views of a figure given below.



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Code : 1G311

R11

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET

(AUTONOMOUS)

B.Tech I Year Regular Examinations, May/June 2012

ELECTRONIC DEVICES AND CIRCUITS

(Common to EEE and ECE Branches)

(For students admitted in 2011-12)

Time: 3 hours **Max Marks: 70**

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Answer any FIVE of the following

All questions carry equal marks

1. a) State and explain the law of Mass action with neat expressions. 7M

   b) A bar of N-type silicon has length of 4cm and circular cross section of $10mm^2$. When it is subjected to a voltage of 1 V applied across its length the current flowing through it is 5mA. Calculate

      i) Concentration of free electrons

      ii) Drift velocity of electrons.

   Assume charge on one electron as $1.6X10^{-19}c$ and mobility of free electron as $1300cm^2$ / V-s. 7M

2. a) Derive the V-I characteristics of PN junction diode. 7M

   b) Compare and contrast Zener break down and Avalnche break down clearly. 7M

3. a) Bring out differences between full wave rectifier and half wave rectifier. 7M

   b) A full wave rectifier circuit is fed from a transformer having a center tapped secondary winding. The RMS voltage from either end of secondary to center tap is 30V. If the diode forward resistance is 2 Ohms and that of the half secondary is 8 Ohms for a load of 1 kilo ohm, calculate 8M

      i) Power delivered load

      ii) % regulation at full load

      iii) Efficiency of rectification

      iv) TUF of secondary

4. a) Explain the input and output characteristics of a transistor in CB configuration. 7M

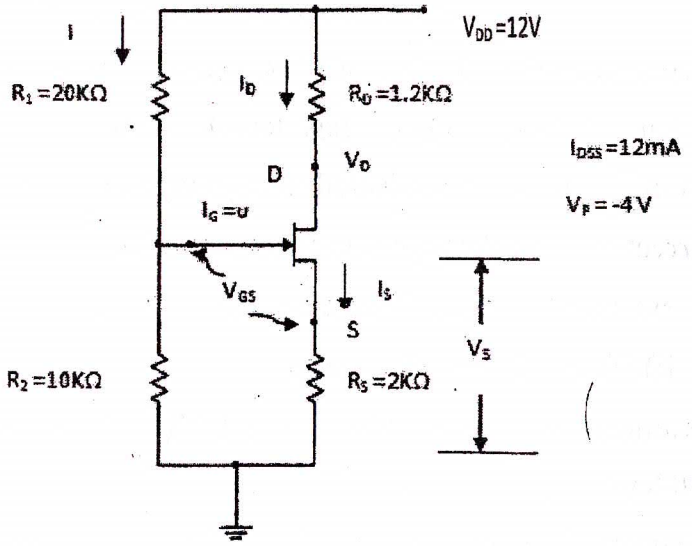
   b) Bring out the comparison of transistor configurations clearly. 7M

5. a) For a collector to base bias circuit, show that $S = \frac{1+\beta}{1+\beta\left(\frac{R_C}{R_C+R_B}\right)}$ 7M

   b) Draw a self bias circuit and explain qualitatively why such a circuit is an improvement on the fixed bias circuit as for as stability is concerned. 7M

6. a) Explain the operation of JFET with neat sketches. 7M

   b) For the circuit shown in fig below calculate I_D, V_{GS}, V_G, V_{DS} and V_S



7M

7. a) The transistor is connected as a common emitter amplifier and h-parameters are h_{ie} = 1100 Ω, h_{re} = 2.5 x 10^{-4}, h_{fe} = 50, h_{oe} = 24 micro amps/volt, $1/h_0$=40 K Ω. If load resistance R_L=10 K Ω and R_S = 1kohms. Find A_I, R_i, A_V, A_{VS}, A_{IS}, R_O and derive the expressions used to solve this problem. 10M

   b) State and explain miller's theorem and its dual. 4M

8. a) Explain the construction and operation of tunnel diode with the help V-I characteristics. 7M

   b) Explain the construction and operation of photo transistor with neat sketches. 7M

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Code : 1GC13 **R11**

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)
B.Tech I Year Regular Examinations, May/June 2012
ENGINEERING CHEMISTRY
(Common to All Branches)
(For students admitted in 2011-12)

Time: 3 hours **Max Marks: 70**

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Answer any FIVE of the following
All questions carry equal marks

1. a) Two liters of water obtain from well near Tirupati showed the following analysis per liter : $MgSO_4$= 24mg ; $Ca(HCo_3)_2$ = 32.4 mg; $Mg(HCo_3)_2$=29.2 mg; $CaSO_4$ =27.2mg ; suspended matter = 36mg. calculate the temporary, permanent and total hardness of water in ppm units. 8M

   b) Describe the scale and sludge formations in boiler? Explain its drawbacks. 6M

2. a) The resistance of N/2 solution of an electrolyte in a cell was found to be 50 ohm. Calculate the equivalent conductance of the solution, if the electrodes in a cell are 2.2 cm apart with an area of 3.8 sq cm. 7M

   b) What is meant by fuel cell? Explain the Hydrogen-Oxygen fuel cell. 7M

3. a) Explain how heterogeneity of metal increases the rate of corrosion? 6M

   b) Give reasons for the following 8M

      i) Pin holes on tin coated Iron are more prone to corrosion of Iron than those of Zinc coated Iron.

      ii) Iron corrode faster than aluminium though 'Al' is above Iron in emf series.

      iii) Use of dissimilar metals should be avoided.

      iv) Corrosion of specimen can be controlled by using impressed current.

4. a) How is Bakelite manufactured? Explain its properties and applications. 7M

   b) Distinguish between thermoplastic and thermosetting resins with suitable examples. 7M

5. a) Define an explosive? How are they classified? Criteria for a good explosive. 7M

   b) Write short notes on 7M

      i) Dynamite

      ii) TNT

6. a) For one component system, the triple point is an invariant system? Discuss. 7M

   b) Determine the number of phases, components and degree of freedom in the system ice, water and water vapour in equilibrium. 7M

7. a) What are chemical fuels? Give their classification with examples. 6M

   b) An oil analysis gave the following results? C:85% ; H=12% and O=3%. Find the weight required for minimum air for burning of 1 Kg of the fuel. 8M

8. a) What is meant by setting and hardening of cement? Explain with chemical reactions. 7M

   b) Write briefly causes for the failure of a refractory material. 7M

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R11

Code : 1GC12

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET

(AUTONOMOUS)

B.Tech I Year Regular Examinations, May/June 2012

ENGINEERING PHYSICS

(Common to All Branches)

(For students admitted in 2011-12)

Time: 3 hours **Max Marks: 70**

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Answer any FIVE of the following

All questions carry equal marks

1. a) Mention necessary conditions to obtain Interference of light. 3M

   b) Describe the theory and the experimental procedure to determine the wave length of light source by forming Newton's rings. 7M

   c) In Newton's rings experiment the diameter of 5the ring is reduced to three fourths of its initial value after introducing a liquid below the convex surface. Calculate the refractive index of the liquid. 4M

2. a) Describe the seven crystal systems based on the lattice parameters. 7M

   b) Show that, FCC is the most closely packed of three basic cubic structures by working out the packing factors. 7M

3. a) State and explain deBroglie's hypothesis of matter Waves. 3M

   b) Discuss the motion of an electron in a periodic potential field using Kronig-Penney Model. 7M

   c) An electron is bound in one dimensional potential box of width $1X10^{-10}$ m. Find its energy in the ground state.
   Given planck's constant = $6.626 \text{ X } 10^{-34}$ J – sec^{-1}
   and mass of electron = $9.1 \text{ X } 10^{-31}$ kg. 4M

4. a) Explain drift and diffusion in a semiconductor. 5M

   b) Derive Einstein's relation for charge carriers in a semiconductor. 5M

   c) Explain diode current equation. 4M

5. a) Show that ionic polarization of a dielectric is independent of temperature. 4M

   b) Explain the origin of orbital magnetic moment in an atom. 6M

   c) Explain the ferroelectric behavior of Barium Titanate ($BaTiO_3$) 4M

6.	a)	State and explain Meissner effect in super conductors.	4M
	b)	Describe the construction and working principle of He-Ne laser.	7M
	c)	Mention the important applications of super conductors.	3M
7.	a)	Explain the various types of optical fibers based on their refractive index profiles and light propagation.	4M
	b)	Describe the working of optical fiber communication system with a neat diagram.	6M
	c)	Explain the construction and reconstruction of hologram.	4M
8.	a)	Explain the basic fabrication methods of nano materials	4M
	b)	What is carbon nano tubes? Describe the various types of carbon nano tubes along with its properties.	10M

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Code : 1GC11

R11

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET

(AUTONOMOUS)

B.Tech I Year Regular Examinations, May/June 2012

ENGLISH

(Common to All Branches)

(For students admitted in 2011-12)

Time: 3 hours **Max Marks: 70**

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Answer any FIVE of the following

All questions carry equal marks

1. "Inevitably, Ladakh is something of a test case of what good as well as bad can be brought by travelers". Elaborate.
2. a) Write about the early hood and education of Visvesvaraya.
   b) Why did Mother Teresa shifted her service from God to the poor and the needy?
3. a) Did Miss. Krishna make a good Guest? Give reasons for your answer.
   b) Why was the day when Raman walked into the IACS a historic moment?
4. a) According to Satyajit Ray, what are the three factors that should guide a director when he/she chooses a story for a film?
   b) How does Ray describe the films that are commonly made in India?
5. a) How did Vikram Sarabhai setup physical research Laboratary?
   b) What is the unique feature of new communication network systems developed by Sam Pitroda?
6. How did Anand become a great chess champion? What are the distinctions that Anand achieved?
7. a) Imagine that you are the assistant Medical officer, District Health Center, Chittoor (Dt). It has been noticed that dengue fever has spread over the district recently. Around 40 dengue cases have been found out of which 6 were died. Hence, you have been directed by the Chief Medical officer of the same district to conduct a survey to get accurate data and to suggest some ways and means to control the dengue virus. Write a report stating all the above mentioned and submit it for its kind perusal.
   b) Write a letter to the Principal of your college to arrange for a reading room in the library and also sports and games.

8. a) Correct the following sentences :

i) She went out without some money.

ii) I am suffering with fever now.

iii) Sarala has seen a movie last week.

iv) Speak fluently English.

v) Bread and butter are my food.

b) Write meanings for the following idioms :

i) flash on pan.

ii) once in a blue moon.

iii) a bolt from the blue.

iv) in leaps and bounds.

v) by hook or by crook.

c) Give one word substitute for the following :

i) belief that there is no god.

ii) person who is expert in taste.

iii) a doctor who treats the ailments of heart.

iv) Fear of animals.

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R11

Code : 1GC14

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET

(AUTONOMOUS)

B.Tech I Year Regular Examinations, May/June 2012

MATHEMATICS-I

(Common to All Branches)

(For students admitted in 2011-12)

Time: 3 hours **Max Marks: 70**

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Answer any FIVE of the following

All questions carry equal marks

1. a) Solve $\left(1+e^{\frac{x}{y}}\right)dx+e^{\frac{x}{y}}\left(1-\frac{x}{y}\right)dy=0$

   b) Find the orthogonal Trajectories of the family of cardioids $r=a(1-\cos\theta)$ where a is the parameter.

   c) A body is kept in air with temperature 25^0 C cools from 140^0 to 80^0 C in 20 minutes. Find when the body cools down to 35^0 C.

2. a) Solve $(D^2+3D+2)\,y=\ e^{-x}+x^2+\cos x$

   b) Solve by method of variation of parameters $(D^2+1)\,y=x\cos x$

3. a) Verify Rolle's theorem for $f(x)=2x^3+x^2-4x-2\ in\ [-\sqrt{2}\ ,\sqrt{2}\ ]$.

   b) Find the extreme values of $f(x,\ y)=\ x^2y^2-5x^2-8xy-5y^2$

4. a) Trace the curve $y^2(a+x)=\ x^2\ (3a-x)$

   b) The part of the parabola cut off by the latus rectum is rotated (i) about the latus rectum (ii) about the axis. Show that the volumes generated are in the ratio 16:15

5. a) Evaluate $\int_0^1\int_0^{1-z}\int_0^{1-y-z}xyz\ dxdydz$

   b) Evaluate the integral by changing the order of integration $\int_0^a\int_{x/a}^{\sqrt{x/a}}(x^2+\ y^2)dxdy$

6. a) Find the Laplace Transform of $\left\{\left(\sqrt{t}+\frac{1}{\sqrt{t}}\right)^3\right\}$

   b) Find $L^{-1}\left[\ \frac{s}{(s^2+1)(s^2+9)(s^2+25)}\right]$

7. Solve the differential equation $y^{ii}+y=t, y(0)=1, y'(0)=2$ using Laplace transform.

8. Verify Stokes theorem for $F=(x^2-\ y^2)i+2xyj$ over the box bounded by the planes x=0, x=a, y=0, y=b.

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