Code : 1G112 **R-11**

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(Autonomous)

B.Tech I Year Regular&Supplementary Examinations May/June– 2013

C Programming and Introduction to Data Structures
(Common to CIVIL, EEE , ME & ECE)

Max. Marks: 70 **Time: 03 Hours**

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Answer *any five* questions
All Questions carry equal marks (14 Marks each)

1. a) What is a flowchart? List and explain various symbols used in the flowchart. Draw the flowchart to find the factorial of a given number. 7M
   b) Discuss about the application of software development method. 7M
2. a) Give a brief note on the following:
   i. operator precedence and associatively
   ii. Type conversions 6M
   b) With examples, explain how while, do while and for loops function. 8M
3. a) Write the syntax for declaring two - dimensional array and explain how to access and print the array elements. 7M
   b) Give a note on storage classes in C. 7M
4. a) Explain the concept of pointer to pointers with examples. 6M
   b) Explain any four string handling functions with examples. 8M
5. a) Give a brief notes bit fields and enumerated data types. 7M
   b) How to use arrays as structure members. Illustrate with example? 7M
6. Write a C program to read a text file and to count
   (a) Number of characters,
   (b) Number of words and
   (c) Number of sentences and write in an output file. 14M
7. a) What is a stack? Explain two different representations of a stack. List the operations performed on a stack and write functions for implementing these operations. 10M
   b) Mention the advantages of doubly linked list over singly linked list. 4M
8. a) By hand, trace through the steps of selection sort for the following lists.
      i. The following seven numbers to be sorted into increasing order:
         12 20 34 27 30 36 23
      ii. The following list of 14 names to be sorted into alphabetical order.
         Tim Dom Eva Roy Tom Kim Guy Amy Jon Ann Jim Kay Ron Jan 12M
   b) Why binary search is efficient compared to sequential search. 2M

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Code : 1G311

R-11

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
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B.Tech I Year Regular&Supplementary Examinations May/June– 2013

Electronic Devices and circuits
(Common to EEE & ECE)

Max. Marks: 70 **Time: 03 Hours**

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Answer *any five* questions
All Questions carry equal marks (14 Marks each)

1. a) What do you understand by depletion region at p-n junction? What is the effect of forward and reverse biasing on the depletion region of p-n junction? Explain with necessary diagrams 7M
   b) Explain Zener and avalanche breakdown mechanisms in detail. 7M
2. a) Draw the circuit diagram of full-wave rectifier and derive expression for its ripple factor. 7M
   b) A HWR circuit supplies 100mA DC current to a 250Ω load. Find the DC output voltage, PIV rating of a diode and the r.m.s. voltage for the transformer supplying the rectifier. 7M
3. a) With neat sketches and necessary waveforms, explain the input and output characteristics of a BJT in CE configuration. Also derive expression for output voltage. 10M
   b) Derive the relation among α, β and γ. 4M
4. a) Explain the criteria for fixing the operating point. 7M
   b) Explain about the operation of a transistor as an amplifier. 7M
5. a) Explain the basic need of biasing for transistor. Draw the circuit diagrams of different biasing networks. 7M
   b) Design a fixed bias circuit using silicon transistor, with the following specifications: V_{CC} = 16V, V_{BE} = 0.7V, V_{CEQ} = 8V, I_{CQ} = 4 mA & β= 50. 7M
6. a) Draw the structure of n-channel depletion type MOSFET and explain its principle of operation with neat sketches. 7M
   b) What are he biasing schemes available in a JFET? Explain any one of the biasing schemes? 7M
7. Draw the basic circuit, ac equivalent and h-parameter model of a Common Emitter amplifier. Derive expressions for A_{Vs}, A_{Is}, R_I & R_O. 14M
8. a) What is meant by tunneling mechanism? Explain about the V-I characteristics of a tunnel diode. 8M
   b) With respect to working principle, what are the differences between LED and LCD? 6M

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Code : 1GC13

R-11

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
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B.Tech I Year Regular&Supplementary Examinations May/June– 2013

Engineering Chemistry
(Common to All Branches)

Max. Marks: 70 **Time: 03 Hours**

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Answer *any five* questions
All Questions carry equal marks (14 Marks each)

1.	a)	Describe any two methods of internal conditioning of boiler feed water.	4M
	b)	Write notes on the following	
		(i) Disinfection	3M
		(ii) Caustic embrittlement	4M
		(iii) Scale and sludge	3M
2.	a)	What is standard electrode potential? What is the significance of Nernst equation?	7M
	b)	Write the characteristics of thermal insulators.	7M
3.	a)	What is electrochemical theory (wet) of corrosion? Explain the mechanism of it.	8M
	b)	What is galvanic series and give its significance.	6M
4.	a)	What is functionality?. Distinguish between additional and condensation polymerization with examples.	5M
	b)	Give the manufacture and uses of the following	
		(i) Bakelite	3M
		(ii) Nylons	3M
		(iii) Silicone rubber	3M
5.		Write short notes on the following	
		(i) Viscosity index	4M
		(ii) Flash and fire points	3M
		(iii) Aniline point	3M
		(iv) Propellants	4M
6.	a)	What is phase rule and explain the terms with suitable examples.	7M
	b)	Discuss the phase diagram of two-component, lead-silver system.	7M
7.	a)	What is metallurgical coke? Describe the process of the manufacture of metallurgical coke	7M
	b)	A fuel found to contain C-75%, H-5.2%, O-12.8%, S-1.2%, N-3.7% and rest is ash. Calculate the amount of air required for the complete combustion of 1 kg of fuel, if 20% excess air is used for combustion. Calculate the amount of dry products in the flue gas.	7M
8.		Write short notes on the following.	
		(i) Refractoriness-under-load	4M
		(ii) Thermal spalling	3M
		(iii) Dimensional stability of refractory.	3M
		(iv) Setting and hardening of cement	4M

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Code : 1G513b

R-11

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
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B.Tech I Year Regular & Supplementary May/June 2013

Engineering Drawing

(Electronics and Communcations Engineering)

Max. Marks: 70 **Time: 03 Hours**

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Answer *any five* questions

All Questions carry equal marks (14 Marks each)

1. Draw an ellipse by auxiliary circles method. Given the major and minor axis as 120mm and 80mm respectively. Draw a tangent and normal at any point on the ellipse using auxiliary circles. 14M
2. A circle of 50mm diameter, rolls without slipping on the outside of another circle of diameter 150mm. Show the path of a point on the periphery of the rolling circle, diametrically opposite to the initial point of contact between the circles. 14M
3. a) A point 'A' is 30mm above HP and In the first Quadrant. Its shortest distance from the reference line XY is 50mm. Draw the projections of the point and determine its distance from V.P. 5M

   b) A line AB of 100mm length, is inclined at an angle of 30^0 to H.P. and 45^0 to V.P. The point A is 15mm above H.P., 20mm in front of V.P. and 120mm from right profile plane. Draw

   i) Front view ii) Top View iii) Left side view of the line AB. 9M
4. A regular hexagonal plane of 45mm side has a corner on H.P. and its surface is inclined at 45^0 to H.P. Draw the projections when the diagonal through the corner, which is on H.P. makes 30^0 with V.P. 14M
5. a) A pentagonal pyramid with side of base 25mm and axis 70mm long, has a triangular face on V.P. and the edge of the base contained by that face is inclined at 30^0 to H.P. Draw its projections. 8M

   b) A square pyramid of side of base 40mm and altitude 70mm lies with all the edges of the base equally inclined to H.P. and the axis parallel to and 50mm from both H.P. and V.P. Draw its projections. 6M
6. Draw the isometric view of a hexagonal prism, with side of base 25mm and axis 60mm long. The prism is resting on its base on H.P. with an edge of the base parallel to V.P. 14M
7. Two views of an object are shown in figure1 below. Draw the isometric view of the object(All dimensions are in mm)

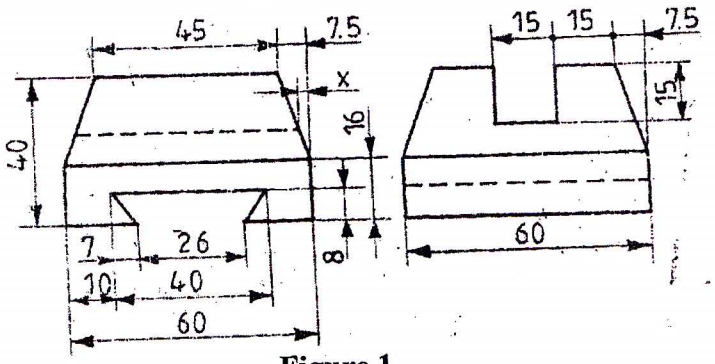

Figure 1 14M

8. Consider the picture shown in figure2 below and draw the front view, top view and side views in first angle projections.

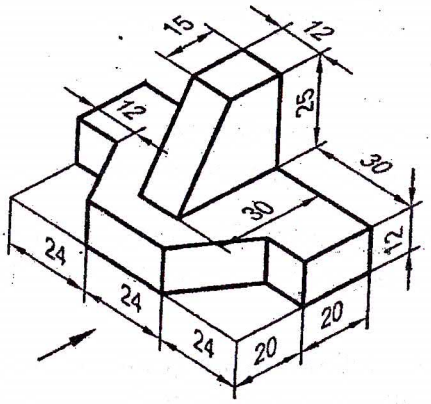

Figure 2

14M

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Code : 1GC12

R-11

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(Autonomous)

B.Tech I Year Regular&Supplementary Examinations May/June– 2013

Engineering Physics
(Common to All Branches)

Max. Marks: 70 **Time: 03 Hours**

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Answer *any five* questions
All Questions carry equal marks (12 Marks each)

1. a) Explain the formation along with its features of the grating spectrum. 4M
   b) Describe the working principle of Nicol prism with neat diagram. 6M
   c) Find the minimum thickness of half and quarter wave plates for a light of wavelength 589nm , if μ_o = 1.658 and μ_e = 1.486. 4M
2. a) Show that FCC crystal is closely packed than BCC crystal based on the packing fractions of the corresponding crystals. 4M
   b) Describe Powder method for determination of crystal structure along with its merits. 7M
   c) For a simple cubic lattice find the ratios of interplannar separation $d_{111} : d_{110} : d_{100}$ 3M
3. a) Explain the origin of energy bands in solids 4M
   b) Describe the behavior of a particle in one dimensional potential box in terms of normalization of wave function and possible Eigen energy values. 7M
   c) Find the wavelength of an electron moving with a velocity of 500 m s^{-1}
   Given h=6.626x 10^{-34} J-s, m=9.1x10^{-31} Kg 3M
4. a) Distinguish between the drift and diffusion process of charge carriers in a semiconductor. 4M
   b) State and explain Hall effect in semiconductors. 6M
   c) Mention the important applications of Photo diode. 4M
5. a) Distinguish between soft and hard magnetic materials. 4M
   b) Derive Clausius-Mossotti equation for a dielectric. 6M
   c) Explain the dependence of dielectric polarisability on the frequency of the applied alternating field. 4M
6. a) What is population inversion? Mention its significant role in LASER emission. 4M
   b) Explain the behavior of type I and II superconductors in the presence of varying magnetic field. 6M
   c) Mention the applications of laser in medical field. 4M
7. a) Explain the basic principle of optical fiber. 4M
   b) Describe graded index optical fiber along with its refractive index profile. Mention its merits. 6M
   c) Mention the applications of holography in various fields. 4M
8. a) Describe the synthesis of nanomaterials by plasma arching method. 7M
   b) Explain the important variations in properties of nanomaterials based on surface to volume ratio and quantum confinement effects. 7M

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Code : 1GC11

R-11

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
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B.Tech I Year Regular&Supplementary Examinations May/June– 2013

English
(Common to All Branches)

Max. Marks: 70 **Time: 3 Hours**

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Answer *any five* questions
All questions carry equal marks (14 Marks each)

1. a) How do we come to know that Miss Krishna is a kleptomaniac of good taste?
   b) "Miss Krishna was an irritating guest". How did she irritate the writer?
2. Do you think the administration of Cuddalore has done a commendable job in reacting to the disaster? Illustrate.
3. "Keep the joy of loving the poor and share this joy with all you meet." Illustrate how Mother Teresa practiced it.
4. a) The day when Raman walked into the IACS was a historic moment. Give reasons to support this.
   b) Give an account of C.V Raman's work at the University of Calcutta.
5. Describe Sam Pitroda`s accomplishments.
6. Describe the versatile genius of Visvesvaraya.
7. a) Your district collector is concerned about the rapid increase in the number of road accidents in the district. You as the Commissioner of local Municipality have been asked to submit a report investigating the causes and suggesting measures to improve the situation.
   b) Write a letter to the editor of a news paper about the condition of open drains in your locality.
8. a) **Correct the following sentences and rewrite them:**
      i) Do you know what is her name?
      ii) Have you taken your meals?
      iii) It costed me five hundred rupees.
      iv) He is better than any student.
      v) It took me an hour to fill the application.
   b) **Give one word substitutes for the following:**
      i) An award given after one's death.
      ii) One who has many talents.
      iii) A paper written by hand.
      iv) A remedy for all diseases.
      v) That which cannot be read.
   c) **Use the following idioms in your own sentences:**
      i) a feather in one's cap
      ii) black sheep
      iii) a cock and bull story
      iv) like a fish out of water

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Code : 1GC14

R-11

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
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B.Tech I Year Regular&Supplementary Examinations May/June– 2013

Mathematics-I
(Common to All Branches)

Max. Marks: 70 **Time: 03 Hours**

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Answer *any five* questions
All Questions carry equal marks (14 Marks each)

1. a) Solve $x\frac{dy}{dx} + y = x^3 y^6$ 7M

   b) If the temperature of a body is changing from 100^0c to 70^0c in 15 minutes, find when the temperature will be 40^0c, if the temperature of air is 30^0c 7M

2. a) Solve $(D^2 + 5D - 6)y = Sin\ 4x\ Sin\ x$ 7M

   b) Solve $\frac{d^2y}{dx^2} + 9y = \tan 3x$, by the method of variation of parameters 7M

3. a) Verify Lagrange's mean value theorem for f(x) = $\log_e$ x in [1,e] 7M

   b) If x = r sin θ cos Φ , y = r sin θ sin Φ, z = r cos θ, show that $\frac{\partial(x,y,z)}{\partial(r,\theta,\emptyset)} = r^2 \sin\theta$ 7M

4. a) Trace the curve r = a + b cos θ , $a > b$ 7M

   b) Find the surface area of the solid generated by the revolution of astroid $x^{2/3} + y^{2/3} = a^{2/3}$ about the y-axis 7M

5. a) Evaluate $\int_0^5 \int_0^{x^2} x(x^2 + y^2)\, dy\, dx$ 7M

   b) Evaluate the integral $\int_0^a \int_{x^2/a}^{2a-x} xy^2\, dy\, dx$ by changing the order of integration 7M

6. a) Find the Laplace transform of $\cosh^2 2t$ 4M

   b) Find the Laplace transform of $t\, e^{-t} \sin t$ 5M

   c) Find $L^{-1}\left[\frac{1}{(s-1)(s+3)}\right]$ 5M

7. Solve the Differential equation by Laplace transform
   $x^{11}(t) + 4\, x^1(t) + 4\, x(t) = 4\, e^{-2t}$, x(0) = -1, $x^1(0) = 4$ 14M

8. Verify Green's theorem in the plane for $\oint_c (3x^2 - 8y^2)\, dx + (4y - 6xy)\, dy$, where 'c' encloses the region bounded by $y = \sqrt{x}$ and $y = x^2$ 14M

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