

Date: 04-07-2011

Code: BT201

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)
L.B. Reddy Nagar :: Mylavaram - 521 230 :: Krishna Dist.

I B.Tech. II Semester Regular Examinations, July, 2011

APPLIED MATHEMATICS - II

(Common to all branches)

Time: 3 hours

Max. Marks: 75

Answer all the questions.

1(a) Find $L \{ (t^2 - 3t + 2) \sin 3t \}$ (7M)

(b) Find the inverse Laplace transform of $\frac{4s+5}{(s-1)^2(s+2)}$ (8M)

OR

(c) Use convolution theorem to find $L^{-1} \left\{ \frac{16}{(s-2)(s+2)^2} \right\}$ (7M)

(d) Solve : $y''' - 3y'' + 3y' - y = t^2 e^t$, $y(0) = 1$, $y'(0) = 0$, $y''(0) = -2$ (8M)

2(a) Find the Fourier series expansion of $f(x) = e^{ax}$ in $(0, 2\pi)$ (7M)

(b) Obtain the half-range cosine series for $f(x) = \sin x$ in $0 \leq x \leq \pi$

Hence show that $\sum_{n=1}^{\infty} \frac{1}{4n^2 - 1} = \frac{1}{2}$ (8M)

OR

(c) Obtain the sine and cosine series for $f(x) = x$ in $0 \leq x \leq \pi$ (8M)

(d) Expand $f(x) = \begin{cases} \frac{1}{4} - x, & \text{if } 0 < x < \frac{1}{2} \\ x - \frac{3}{4}, & \text{if } \frac{1}{2} < x < 1 \end{cases}$ (7M)

as the Fourier series of sine terms.

3(a) Find the Fourier cosine transform of $f(x) = \frac{1}{1+x^2}$ (7M)

(b) Find the Fourier transform of $F(x) = \begin{cases} 1-x^2, & |x| < 1 \\ 0 & , |x| > 1 \end{cases}$

Hence evaluate $\int_0^{\infty} \frac{x \cos x - \sin x}{x^3} \cos \frac{x}{2} dx$ (8M)

(OR)

(c) Use parseval's identity to prove that

$$\int_0^{\infty} \frac{1}{(a^2+t^2)(b^2+t^2)} dt = \frac{\pi}{2ab(a+b)} \quad (8M)$$

(d) Solve the integral equation $\int_0^{\infty} f(x) \cos sx dx = e^{-s}$ (7M)

4(a) Form the partial differential equation from $f(x^2 + y^2, z - xy) = 0$ (7M)

(b) Solve : $Z^2 (P^2 x^2 + q^2) = 1$ (8M)

(OR)

(c) Solve : $(x^2 - y^2 - z^2) p + 2xyq = 2xz$ (7M)

(d) Solve the equation $\frac{\partial u}{\partial t} = a^2 \frac{\partial^2 u}{\partial x^2}$, $0 < x < 1, t > 0$; subject to the conditions $u(0,t) = u(1,t) = 0$ and $u(x,0) = 5 \sin 2\pi x$. (8M)

5(a) Evaluate (i) $Z \left[\frac{1}{n+1} \right]$ (ii) $Z^{-1} \left[\frac{2z^2 + 3z}{(z+2)(z-4)} \right]$ (8M)

(b) Show that $\frac{P(m)P(n)}{P(m+n)} = \beta(m,n)$ (7M)

(OR)

(c) Using Z - Transform, solve $u_{n+2} - 2u_{n+1} + u_n = 3n + 5$ (8M)

(d) Prove that $\beta\left(m, \frac{1}{2}\right) = 2^{2m-1} \beta(m,m)$ (7M)

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I B.Tech. II Semester Regular Examinations, July, 2011

ENGLISH - II

(Common to all branches)

Time: 3 hours

Max. Marks: 75

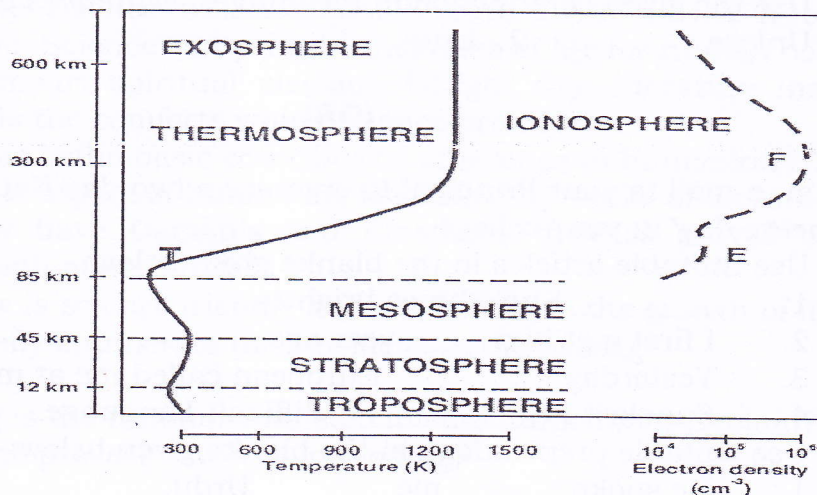
Answer all the questions.
All Questions carry equal marks

- 1(a) Prepare a dialogue between a Medical volunteer and a patient at an eye camp.
(b) Write a letter to your area Post-master regarding the improper delivery of letters.
(c) Interpret the following data and prepare a descriptive paragraph. [5+5+5]

Wheat output in India (in million tonnes)	2005-06	2006-07	2007-08	2008-09	2009-10
A.P	30	35	45	50	55
M.P.	35	40	44	55	65
W.B	33	36	48	57	60
T.N.	35	37	52	65	50
U.P.	45	50	55	65	75

(OR)

- (d) Prepare a dialogue between a transport official and Mr. Roth.
(e) Write a letter to the Principal requesting to arrange Inter-departmental sports and cultural week in your college.
(f) Interpret the following data on the layers above the Earth's crust (km's) and prepare a Report. [5+5+5]



- 2(a) A company is considering a proposal to establish a new factory in your town. Some of the factors which will influence its decisions are given:
(i) State (ii) Raw material (iii) Labour (iv) Transport and communication facilities (v) construction cost (vi) Education facilities.
Invent the necessary details and write a report to the managing director of the company about the suitability of the place for the establishment of a factory. [8m]
- (b) What precautions must be taken for effective 'Presentations', Explain. [7m]

(OR)

- (c) You are the works- manager of Narmada Engineers Pvt. Ltd. Hyderabad. Prepare a report on the causes of frequent accidents and fires caused by electricity during the last 6 months, which is to be submitted to the Managing director of the company. [8m]
- (d) What is the significance of non-verbal communications. [7m]

- 3(a) Write an e-mail to the Director, NSTL, Visakhapatnam seeking permission to visit the Defence Plant by your class. [5m]

- (b) I. Use suitable articles in the blanks given below:
1. Aladin Had _____ wonderful lamp.
 2. The world is _____ happy place
 3. He returned after _____ hour.
 4. _____ School will shortly close for the puja holidays. [4m]
- II. Use suitable prepositions in the blanks given below:
1. The burglar jumped _____ the compound wall.
 2. The village was destroyed _____ fire.
 3. What is that _____ me?
 4. It cannot be done _____ offence, [4m]
- III. Use the given conjunction in meaningful sentences of your own:
1. Unless. [2m]
 2. Until.

(OR)

- (c) Write an e-mail to your Principal to organize a two-day National seminar on 'Engineers day' in your college. [5m]

- (d) I. Use Suitable articles in the blanks given below:
1. _____ Sun Shines brightly
 2. I first met him _____ year ago.
 3. Yesterday _____ European called me at my office.
 4. Sanskrit is _____ difficult Language. [4m]
- II. Use suitable prepositions in the blanks given below:
1. He spoke _____ me _____ Urdu.
 2. The live _____ same roof. [4m]
 3. I Have known him _____ a long time.
- III. Use the given conjunction in meaningful sentences of your own:
1. how. [2m]
 2. as.

4(a) Read the following passage and answer the questions given below:

It is wrong to believe that science has totally eclipsed literature with its inspiring zeal. That literature plays subordinate role to science is equally untrue. Nevertheless, it is undeniable that science has comparatively a wider range for its impact on the physical world than literature. But that does not mean that literature has been incorporated in the realm of science to the extent that it loses its distinct individuality. The reality is that both co-exist without the one overshadowing the other, those who think that science has pushed literature into shade reducing it to a non-entity seem to be simply imaginative and illogical in the comparisons of their respective merits. It is no doubt unquestionable that products of science are of greater material value than those which make an emotional appeal, e.g., a bridge is of greater use to the public than a poem. But thereby one should not ignore the importance of a poem which will continue to appeal to human mind for time to come. It is indisputable that a scientific theory like the one propounded by Einstein is not without its philosophical import as it lays its impress on the future growth of literature. But to be effective in this respect, science should unfold its principles by appealing to human emotions and not through crude and concrete material facts. Darwin's theory of natural selection in its exposition of the evolution of man by appeal to emotions and imagination of men has been conducive to the growth of nineteenth century literature. Man's emotional attitudes to life and vicissitudes of his fortune are colored not only by his inherited instincts and faith in his fate but also by his hope in point of longevity of life and betterment of future prospects. Oriented by a scientific theory, they give a colour to literature.

Literature feeds the emotional and imaginative hunger of man in this perspective science will not oust literature but enrich it by its impact on human life. Science can provide amenities of life for human comfort but fails to lend or impart spiritual pleasure Delight that literature instills in man far transcends the comforts which science provides.

1. What is the basic contribution of science to humankind?
 2. What aspect of human life is fulfilled by works of literature?
 3. How have Darwin's and Einstein's theories proved conducive to the growth of literature?
 4. How is science friendly and not hostile to the growth of literature?
 5. Briefly enumerate the key ideas in the passage. [5m]
- (b) Listening is the fundamental step in communication, Explain? [5m]
(c) Explain the process involved in reading? [5m]

(OR)

- (d) Read the following passage and answer the questions given below:

It is true that the smokers cause some nuisance to the non-smokers, but this nuisance is physical while the nuisance that the non-smokers cause the smokers is spiritual. There are, of course, a lot of non-smokers who don't try to interfere with the smokers. It is sometimes assumed that the non-smokers are morally superior, not realizing that they have missed one of the greatest pleasures of mankind. I am willing to allow that smoking is a moral weakness, but on the other hand we must beware of a man without weakness. He is not to be trusted. He is apt to be always sober and he cannot make a single mistake. His habits are too regular, his existence too mechanical and his head always maintains its supremacy over his heart. Much as I like reasonable persons, I hate completely rational beings. For that reason, I am always scared and ill at ease when I enter a house in which there are no ash-trays.

The room is apt to be too clean and orderly, and the people are apt to be correct and unemotional. Now the moral and spiritual benefits of smoking have never been appreciated by these correct, righteous, unemotional and un-poetic souls. In my opinion the smokers morality is, on the whole, higher than that of the non-smokers. The man with a pipe in his mouth is the man after my heart. He is more genial, more open-hearted, and he is often brilliant in conversation. As Thackeray observes, "the pipe draws wisdom from the lips, of the philosopher and shuts up the mouth of the foolish, it generates a style of conversation that is contemplative, thoughtful, benevolent and unaffected."

1. What kind of hardship do a smoker and a non-smoker cause to each other?
 2. Why is it wrong to think that a non-smoker is morally superior to a smoker?
 3. Why is a man without any moral weakness untrustworthy?
 4. What pleasure of life is missed by a non-smoker?
 5. What does Thackeray mean to say? [5m]
- (e) Explain briefly the various skills in good communication. [5m]
- (f) Explain the various types of reading? [5m]
- 5(a) What are the channels of good communication.
- (b) Elaborate the process of communication.
- (c) Explain the barriers to effective communication. [5+5+5]

(OR)

- (d) What is the significance of non-verbal communication.
- (e) What role do 'gestures' play in the process of communication.
- (f) Explain the significance of body language in communication. [5+5+5]

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I B.Tech. II Semester Regular Examinations, July, 2011

NUMERICAL METHODS

(Common to all branches)

Time: 3 hours

Max. Marks: 75

Answer all the questions.
All Questions carry equal marks

- 1(a) Find the eigen values and eigenvectors of the following matrix.

$$A = \begin{bmatrix} 5 & -2 & 0 \\ 1 & 2 & -3 \\ 1 & -2 & 4 \end{bmatrix} \quad (7M)$$

- (b) Determine the rank of the following matrices.

$$A = \begin{bmatrix} 3 & -3 & 0 \\ 1 & 4 & 5 \\ 4 & 4 & 8 \end{bmatrix} \quad (8M)$$

(OR)

- (c) Verify Cayley-Hamilton theorem and hence find the inverse of the matrix.

$$A = \begin{bmatrix} 1 & 2 & -3 \\ 2 & 1 & -1 \\ -3 & -1 & 2 \end{bmatrix} \quad (7M)$$

- (d) Distinguish between Gauss elimination and Gauss Seidel Iteration methods. (8M)

- 2(a) Find the solution of $f(x) = x^2 - 25 = 0$ using method of false position and Newton Raphson method. (7M)

- (b) Determine the real root of $x \log_{10} x = 1.2$ which lies between 2 and 3 correct to 3 decimal places using Bisection method. (8M)

(OR)

- (c) Describe the Newton Raphson method for finding a root of a polynomial equation with suitable example. (7M)

- (d) Find the root of the following equation by Successive approximation method correct to three decimal places. $x^3 - x^2 - 2x + 1 = 0$ (8M)

- 3(a) The population of a certain town is shown in the following table.

Year	1970	1980	1990	2000	2010
Population in Thousands	40	60	79	102	130

Find the rate of growth of the population in 2000. (7M)

(b) Given the following table of values.

X	0.4	0.5	0.7	0.8
F(x)	-0.916	-0.693	-0.357	-0.223

Estimate the value of $f(0.6)$ using Lagrange interpolation. **(8M)**

(OR)

(c) The following gives the values of $\tan \theta$ for interval $0.10 \leq \theta \leq 0.30$

θ	0.10	0.15	0.20	0.25	0.30
Tan θ	0.1003	0.1511	0.2027	0.2553	0.3093

Calculate the value of 0.12. **(7M)**

(d) Explain the Newton's divided difference formula with suitable example. **(8M)**

4(a) Using Simpsons rule, evaluate $\int_0^{\pi} \sin^3 x \, dx$ from the following data. **(7M)**

x	0	$\frac{\pi}{4}$	$\frac{\pi}{2}$	$\frac{3\pi}{4}$	π
Sin x	0.0	0.7071	1.0	0.7071	0.0

(b) Using trapezoidal rule, approximately calculate the value of $\int_0^6 \frac{dx}{(a+x^2)}$ and compare with actual value. **(8M)**

(OR)

(c) Find $\frac{df}{dx}$ at $x=50$ from the following table. **(7M)**

x	40	42	44	46	48	50
F(x)	3.87	4.12	4.36	4.58	4.80	5.8

(d) Derive simpson's 1/3 rule for finding Numerical Integration. **(8M)**

5(a) Solve $y' - x + y$ with $y(0) = 1$ by using Picard's method and hence find $y(0.1)$ and $y(0.2)$ up to third approximation. **(7M)**

(b) Use simple Runge-Kutta 4th order method to obtain solution to differential equation $\frac{df}{dx} = x y^2; y(1) = 2$ at the points $x = 1.2, x = 1.4$ taking $h = 0.2$. **(8M)**

(OR)

(c) Using Euler's method find the value of y for $x = 0.2$ when $y' = \log(x+y)$ with $y(0) = 1$. **(7M)**

(d) Fit a parabola, by the method of least squares, to the following method. **(8M)**

X	1	2	3	4	5
Y	5	12	26	60	100

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I B.Tech. II Semester Regular Examinations, July, 2011

DATA STRUCTURES

(Computer Science and Engineering)

Time: 3 hours

Max. Marks: 75

Answer all the questions.

All Questions carry equal marks

- 1(a) Define the term algorithm. Discuss various issues involved in study of algorithms. **[15M]**
- (OR)
- (b) Explain the terms (i) Data Structures. (ii) Abstract Data Type. **[6M]**
- (c) Define double linked list Discuss various operations involved in performing double linked list with suitable examples. **[9M]**
- 2(a) What is a Deque? Define the ADT for a Deque? **[9M]**
- (b) Write a program of deque that includes each function of the ADT deque. **[6M]**
- (OR)
- (c) Write a program using stack ADT that reads an infix expression, converts the expression to postfix form and evaluates the post fix expression. **[15M]**
- 3(a) What are the advantages of external sorting? Explain in detail about the following:
1. Multiway merge 2. Poly phase merge 3. Replacement selection. **[15M]**
- (OR)
- (b) Write a program for merge sort **[8M]**
- (c) Write a program for Bucket sort **[7M]**
- 4(a) What is AVL Tree? Write the algorithm to search for an element of an AVL search Tree? What is its time complexity? **[15M]**
- (OR)
- (b) Write a recursive algorithm for binary search Tree operations. **[15M]**
- 5(a) What is collision? Explain collision resolution techniques. **[15M]**
- (OR)
- (b) Explain the following terms.
(i) Hash function (ii) Separate chaining (iii) Open addressing
(iv) Rehashing (v) Extendible hashing. **[15M]**

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I B.Tech. II Semester Regular Examinations, July, 2011

ENGINEERING PHYSICS - II

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 75

Answer all the questions.

All Questions carry equal marks

- 1(a) What are matter waves? Explain de- Broglie hypothesis [7M]
(b) State Heisenberg uncertainty Principle. Explain it with two simple experiments. [8M]
- (OR)
- (c) Determine the energy values of particle in a box as application of Schrodinger's wave equation [8M]
(d) What are the conditions and limitations that the wave function must obey? [4M]
(e) An electron is bound in one-dimensional box of size 4×10^{-10} m. What will be its minimum energy. [3M]
(planks constant = 6.62×10^{-34} J sec. and mass of the electron = 9.1×10^{-31} kg)
- 2(a) Explain the terms: Drift velocity, mean free path and relaxation time. [9M]
(b) Explain in detail the quantum free electron theory. [6M]
- (OR)
- (c) What is an extrinsic semiconductor? Explain the formation of p-type and n-type extrinsic semiconductors. [8M]
(d) Explain the concept of direct and indirect gap semiconductor. [7M]
- 3(a) Explain the terms: Magnetic susceptibility, permeability and magnetic induction. [6M]
(b) Give relation between the magnetic parameters and explain origin of magnetic moment. [9M]
- (OR)
- (c) What is ferromagnetism? Explain ferromagnetism on the basis of domain theory. [2+8M]
(d) Give applications of magnetic materials. [5M]
- 4(a) Describe different types of polarizations in dielectrics. [12M]
(b) The dielectric constant of Helium gas at NTP is 1.0000684. Calculate the electronic polarizability of He atoms if the gas contains 2.7×10^{25} atoms per m^3 ($\epsilon_0 = 8.85 \times 10^{-12}$) [3M]
- (OR)
- (c) Discuss the frequency dependence of polarizability. [8M]
(d) What are ferroelectric materials? Discuss their properties and applications. [7M]
- 5(a) Discuss various techniques for the synthesis of nano materials. [9M]
(b) Discuss how nanotechnology is useful in environment and space. [6M]
- (OR)
- (c) What are quantum nanostructures? Explain density of states for various quantum structures. Give some applications of quantum structure. [15M]

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)
L.B. Reddy Nagar :: Mylavaram - 521 230 :: Krishna Dist.

I B.Tech. II Semester Regular Examinations, July, 2011

ENVIRONMENTAL STUDIES

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 75

Answer all the questions.
All Questions carry equal marks

- 1(a) Discuss the importance and means of creating environmental awareness. [7M]
(b) What are the causes and consequences of deforestations? [8M]

(OR)

- (c) Discuss the impacts of mining on forests and tribal people. [7M]
(d) Write about fertilizer pesticide problems associated with modern agriculture. [8M]

- 2(a) Define the term ecosystem. Explain the function of an ecosystem. [6M]
(b) Distinguish between producers, consumers and decomposers. [6M]
(c) What are ecological pyramids? [3M]

(OR)

- (d) Define biodiversity. What are its values? [6M]
(e) Discuss the various in-situ and ex-situ means of conservation of biodiversity. [9M]

- 3(a) Define water pollution. What are the sources and effects of water pollution. [7M]
(b) Write an essay on indoor air pollution and its control. [8M]

(OR)

- (c) Define floods. What are the causes and discuss the control measures. [7M]
(d) Write short notes on (i) Noise pollution. (ii) Nuclear hazards. [8M]

- 4(a) What is sustainable development? What are the strategies for sustainable development? [10M]
(b) The principle of living is "To live and Let live" Explain. [5M]

(OR)

- (c) "Nature has for man's needs and not for man's greed's". Explain. [7M]
(d) Write short notes on (i) Global warming. (ii) Water Conservation. [8M]

- 5(a) What is man's impact on environment? [15M]

(OR)

- (b) Write the salient features of the water prevention and control of pollution act, 1974. [15M]

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I B.Tech. II Semester Regular Examinations, July, 2011

CLASSICAL MECHANICS

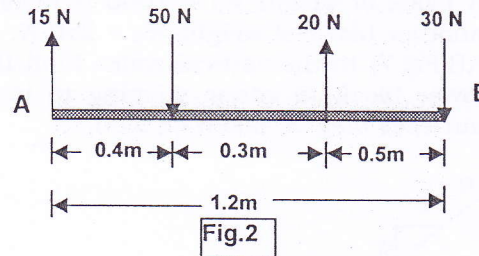
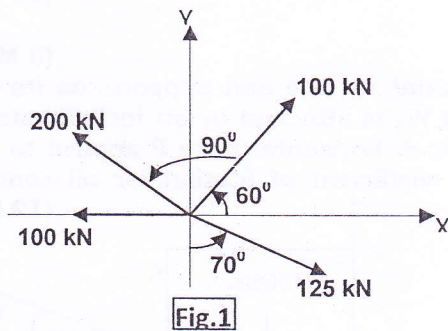
(Electronics and Instrumentation Engineering)

Time: 3 hours

Max. Marks: 75

Answer all the questions.
All questions carry equal marks

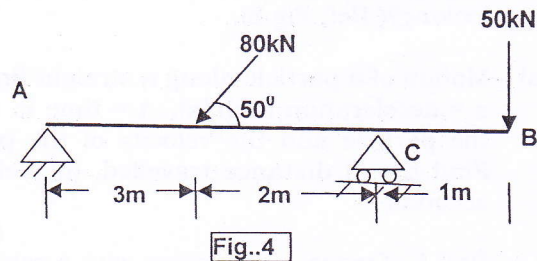
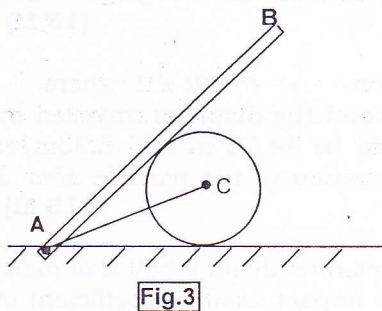
- 1(a) Explain "Parallelogram Law" of forces. (5 M)
 (b) Find the magnitude and direction of the resultant R of four concurrent forces acting as shown in Fig. 1. (10 M)



(OR)

- (c) State and prove "Lami's Theorem". (5 M)
 (d) A Rigid bar is subjected to a system of parallel forces as shown in Fig.2 Reduce the system of forces to (i) Single force, (ii) A Single force-moment system at 'A', (iii) A Single force-moment system at 'B'. (10 M)

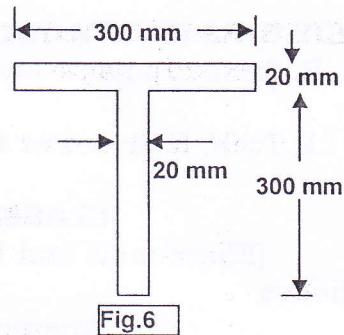
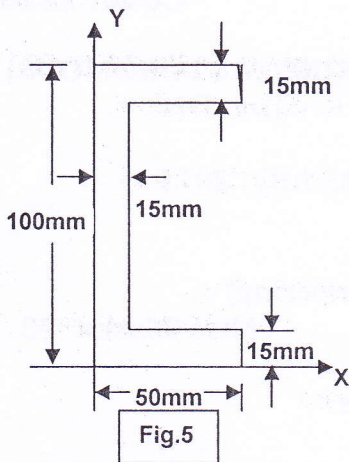
- 2(a) What is 'free body diagram'? Explain with figures. (4 M)
 (b) A smooth right circular cylinder of radius 'r' rests as a horizontal plane and is kept from rolling by an inclined string AC of length 2r(Fig. 3). A prismatic bar AB of length 3r and weight Q is hinged at point A and leans against the roller as shown. Find the tension 'S' that will be induced in string AC. (11 M)



- (c) Describe different types of supports that are used to support beams. (6 M)
 (d) A beam AB is supported and loaded as shown in Fig. 4. Determine the reactions at supports. (9 M)

- 3(a) Locate the centroid of a channel section shown in Fig. 5.

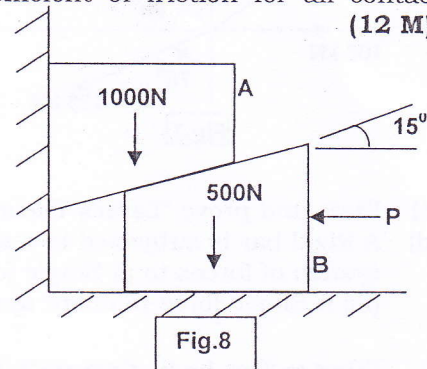
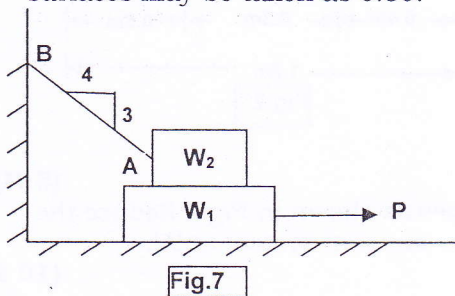
(9 M)



- (b) Find the coordinates of a semi-circular area of radius 'r'. (6 M)
(OR)
(c) Determine the moment of inertia about centroidal x axis for the 'T' Section shown in Fig. 6. Also find the moment of Inertia about x axis passing through base of the section. (15 M)

- 4(a) State Laws of Friction. (3 M)

- (b) A block of weight $W_1 = 1000 \text{ N}$ rests on a horizontal surface and supports on its top another block of weight $W_2 = 250 \text{ N}$. The weight W_2 is attached by an inclined string AB (Fig.7) to the vertical wall. Find the magnitude of horizontal force P applied to the lower block to cause slipping to impend. The coefficient of friction for all contact surfaces may be taken as 0.30. (12 M)



- (OR)
(c) Block A weighing 1000 N is to be raised by means of a 15° wedge B weighing 500 N. Assuming the coefficient of friction between all contact surface to be 0.2, determine what minimum horizontal force P should be applied to raise the block. Assuming that there is no friction between the block A and vertical surface and the wedge is of negligible weight. What is the minimum value of ' μ ' required for the wedge to be self locking? (Ref. Fig.8). (15 M)

- 5(a) Motion of a particle along a straight line is given by equation $a = t^2 - 2t + 2$ where $a =$ acceleration is m/s^2 , $t =$ time in seconds, After 1 second the distance travelled by the particle and the velocity of the particle were found to be 14.75 m and 6.33m/s. Find the (i) distance travelled, (ii) Velocity and (iii) acceleration of the particle after 2 seconds. (15 M)

(OR)

- (b) Ball A of mass 1 kg moving with a velocity of 2m/s impinges directly on a ball B of mass 2 kg at rest. Find the velocities of the two balls after the impact assume coefficient of restitution, $e = 0.5$. (9 M)
(c) An elevator has a downward acceleration of 1m/s^2 . What force will be transmitted to the floor of the elevator by a man weighing 500 N travelling in the lift? Find the force exerted if the elevator moves up with an acceleration of 1 m/s^2 . (6 M)

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Code: IT204

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)
L.B. Reddy Nagar :: Mylavaram - 521 230 :: Krishna Dist.

I B.Tech. II Semester Regular Examinations, July, 2011

DATA STRUCTURES USING C++
(Information Technology)

Time: 3 hours

Max. Marks: 75

Answer all the questions.
All Questions carry equal marks

- 1(a) What is a class? How do you define class in C++ [5M]
(b) What is the difference between "overloading" and "over riding"? [5M]
(c) What is a constructor and destructor? [5M]

(OR)

- (d) What do you mean by data abstraction? [5M]
(e) What do you mean by "this" pointer? [3M]
(f) How a dynamic memory allocation and deallocation is done? [7M]

- 2(a) What is inheritance? Explain various types of inheritance with suitable examples. [15M]

(OR)

- (b) How a run time polymorphism is achieved using virtual function? Explain with a suitable example. [15M]

- 3(a) What are the advantages of Binary search over linear search? Write a program to search in a list using Binary search. [15M]

(OR)

- (b) Explain Bubble sort with an example and write a program for Bubble sort. [8M]

- (c) Explain Insertion sort with an example and write a program for Insertion sort. [7M]

- 4(a) Represent a stack using arrays and linked list. [15M]

(OR)

- (b) What is a Priority Queue? Give uses of priority Queue. [7M]

- (c) What is deque? Explain with suitable example. [8M]

- 5(a) i. Explain about DFS? [10M]
ii. Difference between single and double linked list? [5M]

(OR)

- (b) Define Binary search tree. What are the various operations on binary search tree? Explain in detail with examples. [15M]

11-07-2011

Code: ME204

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)**L.B. Reddy Nagar :: Mylavaram - 521 230 :: Krishna Dist.**

I B.Tech. II Semester Regular Examinations, July, 2011

ENGINEERING MECHANICS-I

(Mechanical Engineering)

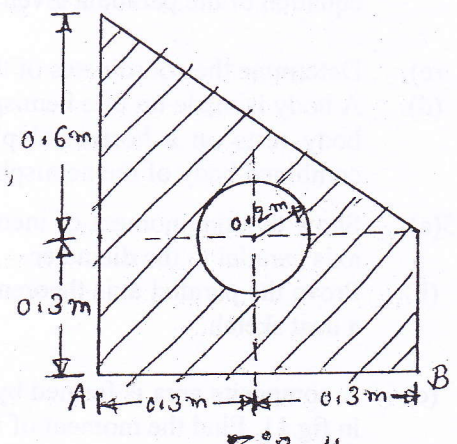
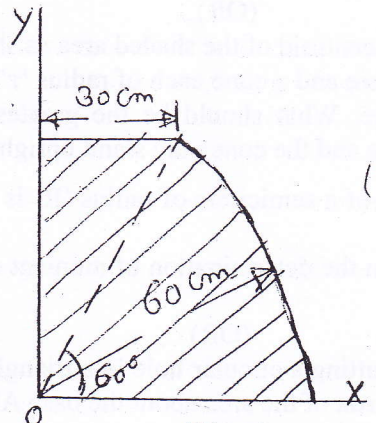
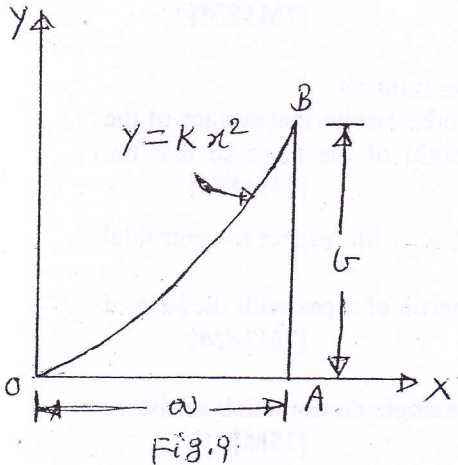
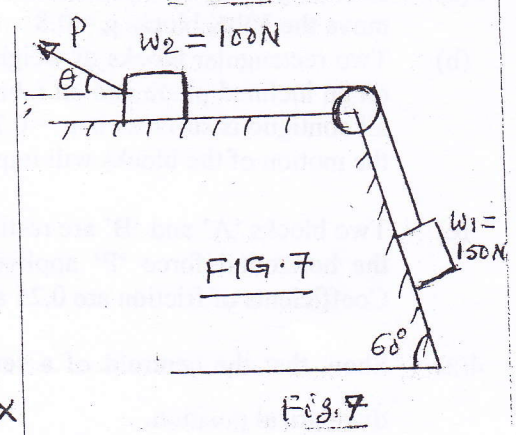
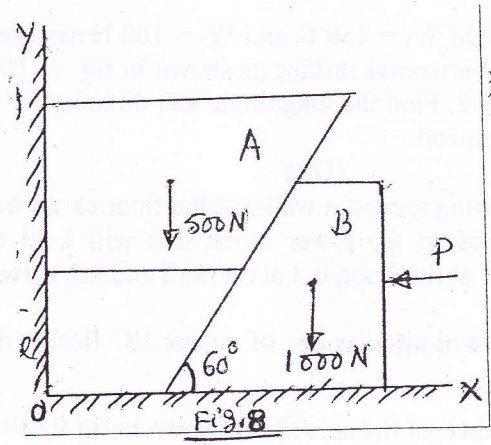
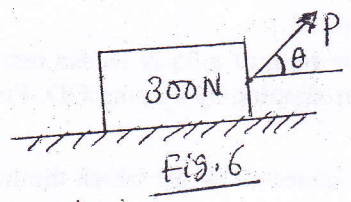
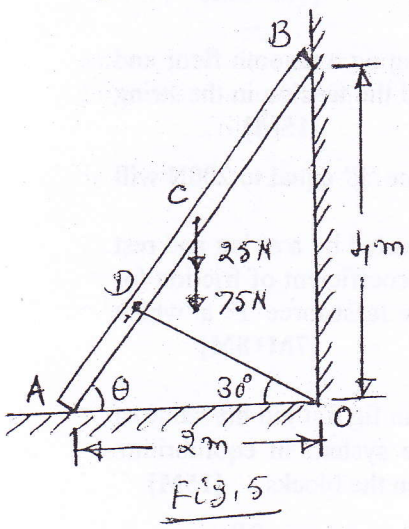
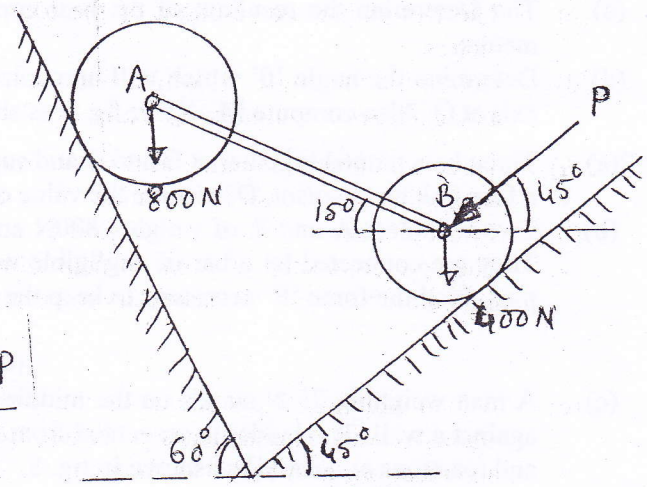
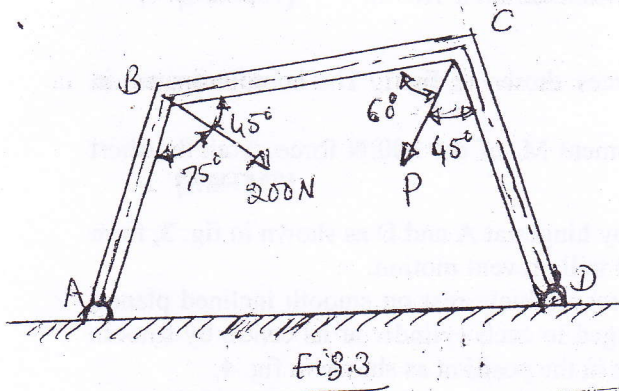
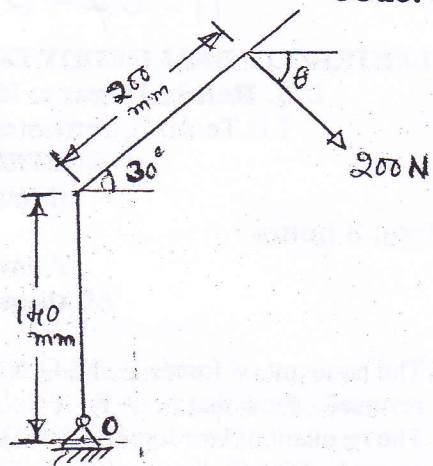
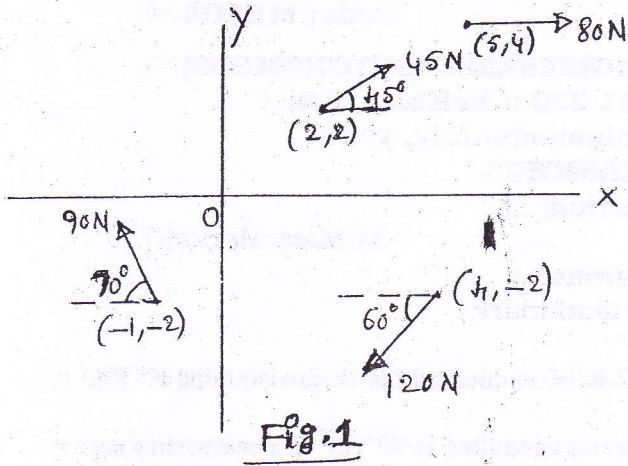
Time: 3 hours

Max. Marks: 75

Answer all the questions.

All questions carry equal marks

- 1(a) The resultant of forces P and Q is R. If Q is doubled R is doubled and R is also doubled if Q is reversed. show that $P: Q: R = \sqrt{2}:\sqrt{3}:\sqrt{2}$
- (b) The resultant of two forces P and Q acting an angle θ is equal to $(2n+1)\sqrt{P^2+Q^2}$ and when they act an angle $(90-\theta)$, the resultant is $(2n-1)\sqrt{P^2+Q^2}$. show that $\tan \theta = n-1/n+1$ [7M+8M]
- (OR)
- (c) Determine the resultant of the four coplanar forces shown in fig 1. The coordinates are in metres.
- (d) Determine the angle ' θ ' which will maximize the moment M_o of the 200 N force about the short axis at O. Also compute M_o . Refer fig. 2 as shown. [7M+8M]
- 2(a) Three bars pinned together at B and C and supported by hinges at A and D as shown in fig. 3, form a four link mechanism, Determine the value of 'P' that will prevent motion.
- (b) Two cylinders A and B of weights 800N and 400N respectively rest on smooth inclined planes. They are connected by a bar of negligible weight hinged to each cylinder at its centre by smooth pins. Find the force 'P' necessary to keep the cylinders in the position as shown in fig. 4. [7M+8M]
- (OR)
- (c) A man weighing 75 N stands on the middle rung of a 25 N ladder resting on a smooth floor and against a wall. The ladder is prevented from slipping by a string OD. Find the tension in the string and reactions at A and B as shown in fig. 5. [15M]
- 3(a) Referring to fig. 6. Determine the range of values of ' θ ' for which the force 'P' equal to 200N will move the 300N block. $\mu = 0.8$
- (b) Two rectangular blocks of weight $W_1 = 150$ N and $W_2 = 100$ N are connected by a string and rest on an inclined plane and on a horizontal surface as shown in fig. 7. The coefficient of friction for all contiguous surfaces is $\mu = 0.2$. Find the magnitude and direction of the least force 'P' at which the motion of the blocks will impend. [7M+8M]
- (OR)
- (c) Two blocks 'A' and 'B' are resting against a wall and the floor as shown in fig 8. Find the value of the horizontal force 'P' applied to the lower block that will hold the system in equilibrium. Coefficients of friction are 0.25 at the floor, 0.3 at the wall and 0.2 between the blocks. [15M]
- 4(a) Show that the centroid of a semi-circular arc of radius 'R' lies at a distance of $\frac{2R}{\pi}$ from its diametrical position.
- (b) Determine the coordinates of C.G. of the area OAB shown in fig 9, if the curve OB represents the equation of the parabola given by $y = Kx^2$. [7M+8M]
- (OR)
- (c) Determine the coordinates of the centroid of the shaded area as shown in fig.10
- (d) A body is made up of a hemisphere and a cone each of radius 'r'. The hemispherical surface of the body rests on a horizontal plane. What should be the greatest height of the cone so that the combined body of the hemisphere and the cone may stand upright. [7M+8M]
- 5(a) Show that the moment of inertia of a semicircle of radius 'R' is $0.11 R^4$ with respect to centroidal axis parallel to the diameter.
- (b) Prove the parallel axis theorem in the determination of moment of inertia of areas with the help of a neat sketch. [7M+8M]
- (OR)
- (c) A composite area is formed by cutting a circular hole in a triangle rectangle combination as shown in fig.11. Find the moment of inertia of the area about the base AB. [15M]



13-07-2011

Code: ME205

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)
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I B.Tech. II Semester Regular Examinations, July, 2011

ENGINEERING GRAPHICS
(Mechanical Engineering)

Time: 3 hours

Max. Marks: 75

Answer all the questions.
All Questions carry equal marks

1. (a) A circle of 50 mm diameter rolls on another circle of 175 mm diameter. Draw and name the curves traced out by two points Q and S lying on a straight line through the centre C of the rolling circle and respectively 20 mm and 35 mm from it, when it rolls (i) outside and (ii) inside the other circle. 8M
- (b) Draw neat sketches and name the different polygons using Geometrical construction. 7M

(OR)

(a) A line PA = 120 mm long rolls without slipping on the periphery of a semicircle of diameter AB 70 mm. Initially, the line is tangential to the circle at A such that AP = 100 mm. Draw the locus of one end of the line and name the curve. 7M

(b) Draw a straight line AB of any length. Mark a point F, 65 mm from AB. Trace the paths of a point P moving in such a way, that the ratio of its distance from the point F, to its distance from AB is (i) 1; (ii) 3:2; ~~(iii) 2:3~~. Plot at least 8 points. Name each curve. Draw a normal and a tangent to each curve at a point on it, 50 mm from F. 8M

2. (a) Draw the projections of a 75 mm long line parallel to both the reference planes. The line is 20 mm behind the VP and 40 mm below the HP. 4M

(b) Draw the projections of a 60 mm long line parallel to the HP and perpendicular to the VP. The line is 10 mm above the HP and one end of the line is 20 mm in front of the VP. 6M

(c) A point A is situated in the first quadrant. Its shortest distance from the intersection point of H.P., V.P. and auxiliary plane is 60 mm and it is equidistance from the principal planes. Draw the projections of the point and determine its distance from the principal planes. 5M

(OR)

(a) A point P is 20 mm below H.P. and lies in the third quadrant. Its shortest distance from xy is 40 mm. Draw its projections. 6M

(b) Two pegs fixed on a wall are 4.5 meters apart. The distance between the pegs measured parallel to the floor is 3.6 meters. If one peg is 1.5 meters above the floor, find the height of the second peg and the inclination of the line joining the 9M

3 (a) The top view of a 75 mm long line CD measures 50 mm, C is 50 mm in front of V.P. and 15 mm below the H.P. D is 15 mm in front of V.P. and is above the H.P. Draw the front view of CD and find its inclinations with the H.P. and the V.P. Show also its traces. 7M

(b) Draw the projections of a 90 mm long line inclined to the VP and parallel to the HP. The line is 10 mm below the HP. One end of the line is 15 mm in front of the VP and the other end is 40 mm behind the VP. Find the inclination of the line with the VP. (6 marks) 8M

(OR)

(a) A line AB is in the first quadrant. Its end A and B are 20 mm and 60 mm in front of the V.P. respectively. The distance between the end projectors is 75 mm. The line is inclined at 30° to the H.P. and its H.T. is 10 mm above xy. Draw the projections of AB and determine its true length and the V.T. 8M

(b) The projections of the ends of a line PQ are 90 mm apart. P is 20 mm above the H.P. while Q is 45 mm behind the V.P. The H.T. and the V.T. of the line coincide with each other on xy, between the two end projectors and 35 mm away from the projector of the end P. Draw the projections of PQ and determine its true length and inclinations with the two planes. 7M

4 (a) A composite plate of negligible thickness is made-up of a rectangle 60 mm X 40 mm, and a semi-circle on its longer side. Draw its projections when the longer side is parallel to the H.P. and inclined at 45° to the V.P. the surface of the plate making 30° with the H.P. 7M

(b) A semi-circular plate of 80 mm diameter has its straight edge in the V.P. and inclined at 45° to the H.P. The surface of the plate makes an angle of 30° with the V.P. Draw its projections. 8M

(OR)

(a) Draw the projections of a rhombus having diagonals 125 mm and 50 mm long, the smaller diagonal of which is parallel to both the principal planes, while the other is inclined at 30° to the H.P. 8M

(b) A 60° set-square of 125 mm longest side is so kept that the longest side is in the H.P. making an angle of 30° with the V.P. and the set-square itself inclined at 45° to the H.P. Draw the projections of the set-square. 7M

5 (a) Draw three views of an earthen flower pot, 25 cm diameter at the top, 15 cm diameter at the bottom, 30 cm high and 2.5 cm thick, when its axis makes an angle of 30° with the vertical. 8M

(b) Draw three views of a cone, base 50 mm diameter and axis 75 mm long, having one of its generators in the V.P. 7M

(OR)

(a) A tetrahedron of 75 mm long edges has one edge parallel to the H.P. and inclined at 45° to the V.P. while a face containing that edge is vertical. Draw its projections. 7M

(b) A triangle pyramid, base on the H.P. and an edge of the base inclined at 45° to the V.P.; the apex 40 mm in front of the V.P. Assume a side of the base 40 mm long or the diameter of the base 50 mm long and the axis 65 mm long and Draw the projections. 8M

13-07-2011

Code: EC205/CS205/EI205/IT205

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)

L.B. Reddy Nagar :: Mylavaram – 521 230 :: Krishna Dist.

I B.Tech. II Semester Regular Examinations, July, 2011

ELECTRONIC DEVICES AND CIRCUITS

(Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology)

Time: 3 hours

Max. Marks: 75

Answer all the questions.

All Questions carry equal marks

- 1(a) Describe Hall Effect with neat diagram. How it helps in determining the properties of semiconductor? (8 M)
- (b) Write the volt-ampere equation for a PN diode. Indicate all the parameters. (7 M)
- (OR)
- (c) Draw the V-I characteristics of zener diode and explain its working. (7 M)
- (d) What is tunneling phenomena? Explain with the help of energy band diagrams. (8 M)
- 2(a) Define ripple factor and rectification efficiency. (6 M)
- (b) Draw full wave bridge rectifier circuit and explain its functioning with neat wave forms. (9 M)
- (OR)
- (c) Derive ripple factor of a full wave rectifier with capacitive filter. (9 M)
- (d) Compare the performance of Inductive, L-section and π - section filters. (6 M)
- 3(a) Define α , β and γ of a transistor and derive the relation among them. (7 M)
- (b) Explain the constructional details of Enhancement MOSFET and explain its working with the help of neat diagrams. (8 M)
- (OR)
- (c) What are the advantages and disadvantages of FET over BJT. (6 M)
- (d) Draw the input and output characteristics of CB transistor indicating all the regions of operation and explain its working. (9 M)

Code: EC205/CS205/EI205/IT205

- 4(a) What is operating point ? Explain its importance. (5 M)
(b) Derive the stability factor for self bias circuit. (10 M)
(OR)
- (c) In a collector to base biased CE amplifier, $V_{cc} = 20V$, $V_{BE} = 0.2V$, $\beta = 100$ and the operating point is chosen such that $V_{CE} = 10.4V$ and $I_C = 9.9 \text{ mA}$. Determine the values of R_B , R_C and stability factor. (9 M)
(d) Draw a circuit of diode compensation and explain its working. (6 M)
- 5(a) Draw the L-Parameter representation of a transistor and indicate all the parameters. (6 M)
(b) Derive the equations for voltage gain, current gain, input impedance and output impedance of CE amplifier. (9 M)

(OR)

- (c) For a CB transistor amplifier driven by voltage source of internal resistance $R_S = 1200\Omega$ and load resistance $R_L = 1000\Omega$. The h parameters are $h_{ib} = 22\Omega$, $h_{rb} = 3 \times 10^{-4}$, $h_{fb} = -0.98$ and $h_{ob} = 0.5\mu A/V$. Compute the current gain A_I , input impedance R_i , voltage gain A_v , overall gain A_{vs} , overall current gain A_{is} , output impedance R_o and power gain A_p using exact analysis and approximate analysis. (15 M)

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13/07/11

Code: EE205

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)

L.B. Reddy Nagar :: Mylavaram - 521 230 :: Krishna Dist.

I B.Tech. II Semester Regular Examinations, July, 2011

ELECTRICAL CIRCUITS ANALYSIS - I

(Electrical and Electronics Engineering)

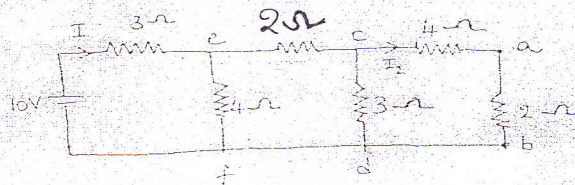
Time: 3 hours

Max. Marks: 75

Answer all the questions.

All Questions carry equal marks

- 1(a) Explain unilateral elements and bilateral elements with example. (6 M)
(b) Calculate V_{ab} and I (9 M)



(OR)

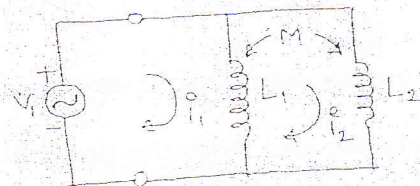
- (c) State and explain Kirchoff's Law. (7 M)
(d) Derive star resistances in terms of Delta resistances. (8 M)

- 2(a) State and explain Faraday's Laws of electromagnetic induction. (6 M)

- (b) An iron ring has a mean diameter of 15 cm, a cross-section of 20 cm² and a radial gap of 0.5 mm cut in it. It is uniformly wound with 1500 turns of insulated wire and a magnetizing current of 1A produces a magnetic flux of 4 m wb. Neglecting the effect of magnetic leakage and fringing. Calculate
(i) Reluctance of the magnetic circuit and (ii) relative permeability of iron. (9 M)

(OR)

- (c) Define Hysteresis Loss and derive Hysteresis power loss. (8 M)
(d) Obtain the effective inductance of the circuit shown below (7 M)

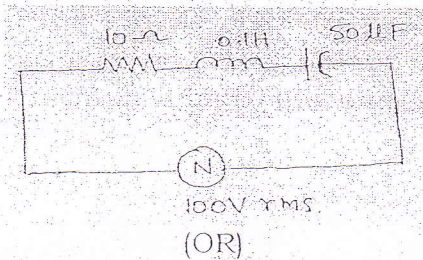


- 3(a) Explain in detail Sinusoidal response of parallel R - L Circuit. (8 M)

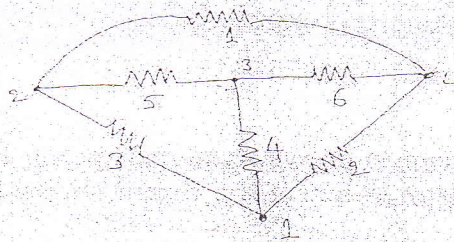
- (b) A coil is connected in series with a non-inductive resistance of 30 Ω across 240V, 50Hz supply. The reading of a voltmeter across the coil is 180 V and across the resistance is 130V. Calculate (i) Power absorbed by the coil, (ii) inductance of the coil, (iii) resistance of the coil and (iv) power factor of the whole circuit. (7 M)

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- (c) Define RMS value, average value, form factor and explain significance as form factor. (6 M)
- (d) A circuit having a resistance of 6Ω and inductive reactance of 8Ω is connected in parallel with another circuit having a resistance of 8Ω and a capacitive reactance of 6Ω the parallel circuit is connected across $200V$, $50Hz$ supply. Calculate (i) Supply current, (ii) Power factor of the whole circuit, (iii) Power consumed, (iv) the resistance and reactance of a series circuit which will take the same current at the same p.f. as the parallel circuit. (9 M)
- 4(a) Define and derive an expression for Q of an inductor. On what factors the Q of a coil depends. (8 M)
- (b) For the circuit shown below, determine the frequency at which the circuit resonates. Also find the voltage across inductor at resonance and the Q factor of the circuit. (7 M)



- (c) Draw locus diagrams for
 a) Series R-L, R-C, b) Parallel R-L, R-C (8 M)
- (d) A series RLC circuit consists of resistance $R = 20$, inductance, $L=0.01H$ and capacitance, $C = 0.04 \mu F$. Calculate the frequency at resonance. If a 10 Volts of frequency equal to the frequency of resonance is applied to this circuit, calculate the values of V_C and V_L across C and L respectively. Find the frequencies at which these voltages V_C and V_L are maximum? (7 M)
- 5(a) Explain the procedure adopted to find the dual of a network. (6 M)
- (b) For the below network, draw the graph and choose a possible tree. Construct the basic tie-set schedule. Write the equations for the branch currents and in terms of the link currents and write separately the independent equations. (9 M)



- (c) Explain the procedure for obtaining fundamental tie-set matrix of a given network. (7 M)
- (d) Draw the dual of the following network and write the procedure. (8 M)

