



B.Sc. (Part III) (Information Technology)
EXAMINATION, 2009

COMPUTER ELECTRIC CIRCUIT AND
ANALYSIS

Time allowed : Three Hours

Maximum Marks : 50

Attempt any Five questions . All questions carry equal marks.

1. (a) State Coulomb's law in electrostatics. Express it in SI units. Mention two similarities and dissimilarities between electrostatic and gravitational interactions. 6
- (b) Find the ratio of electrical force to gravitational force between proton and electron:
(Given: Mass of proton = 1.67×10^{-27} kg
Mass of electron = 9.1×10^{-31} kg
 $1/4\pi \epsilon_0 = 9.0 \times 10^9 \text{ Nm}^2/\text{C}^2$
 $G = 6.67 \times 10^{-11} \text{ Nm}^2/\text{kg}^2$
Electron charge = 1.6×10^{-19} C) 4
2. (a) Define electric flux and electric flux density. What is meant by negative flux? Explain with diagram. Write SI unit and dimension of electric flux. 5
- (b) A point charge of $2.0 \mu\text{C}$ is at the centre of a cubic Gaussian surface. What is the net electric flux through the surface?
(Given: $\epsilon_0 = 8.85 \times 10^{-12} \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2}$) 5
3. (a) Derive the formulae :

$$1/C = 1/C_1 + 1/C_2 + 1/C_3$$

for three capacitors connected in series. Hence obtain the formula for the capacitance of n identical capacitors connected in series. 6

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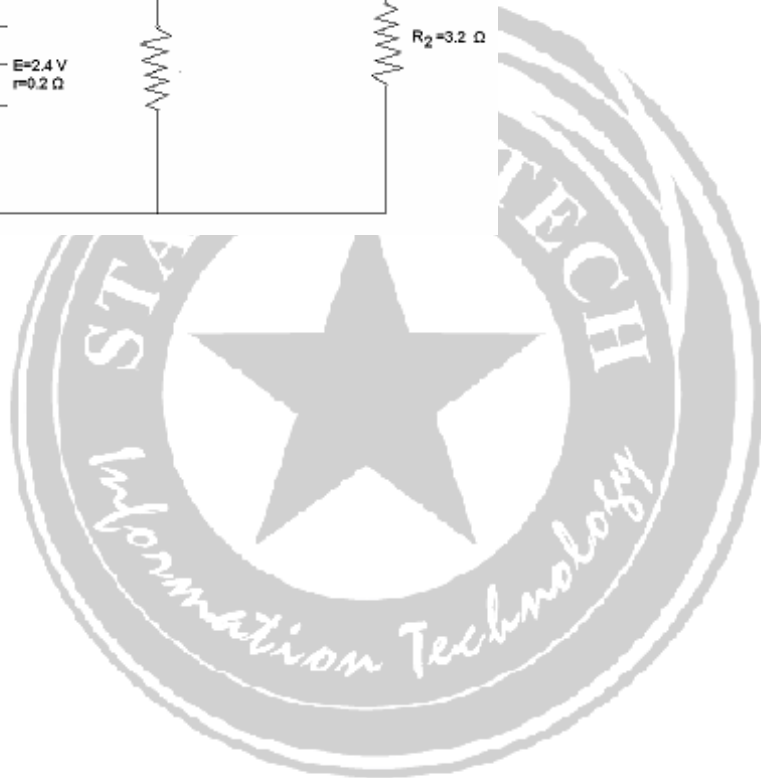
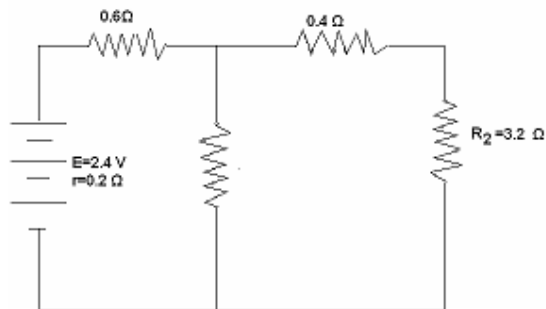
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- (b) How would you combine 8, 12 and 24 μF capacitors to obtain : 5
 (i) minimum capacitance
 (ii) maximum capacitance
4. (a) What do you mean by electric power? Obtain an expression for electric power in a circuit.
 (b) Two wires A and B of equal masses and of the same metal are taken. The diameter of the wire A is half the diameter of the wire B. If the resistance of the wire A be 24 μ , calculate the resistance of wire B. 5
5. (a) Differentiate between e.m.f. and potential difference for a cell. Derive relationship between the two. 5
 (b) Using Kirchoff's law, calculate the values of the electric currents i_1, i_2 and i_3 in the given electric network. 5
6. (a) Derive an expression for the magnetic field intensity due to a bar magnet. 4
 (b) State and explain Faraday's law of electromagnetic induction? What is the significance of the negative sign appearing in the first law? 6
7. (a) Differentiate between diamagnetic, ferromagnetic and paramagnetic materials. 3
 (b) Show that the energy stored in an inductor is :
 $\frac{1}{2}Li_0^2$,
 Where L is the self inductance of the coil. 4
 (c) Show that the time attaining half the value of final steady current in an L-R series circuit is $0.6931 (L/R)$. 3
8. (a) Obtain an expression for the impedance and power factor of an a.c. L-R series circuit. Give the necessary condition for a wattless current in the circuit. 6
 (b) Calculate the r.m.s. current in an a.c. circuit containing a capacitor of 40 μF and a resistor of 10 Ω in series. The power supply in the circuit is rated 230 V, 50 Hz.



9. (a) Explain the principle, construction and working of a transformer. Give the causes of power loss in it. Also explain the utility of transformers in long distance transmission. 6
- (b) A step-up transformer drops the main supply voltage of 220 V to 10 V. The primary draws a current of 5 A and the current induced in the secondary is 100 A. Calculate the efficiency of the transformer. 4
10. (a) State and prove Thevenin's theorem of circuit analysis. 5
- (b) Find the equivalent circuit of the following network using Thevenin's theorem and Norton's theorem and calculate current in load resistance R_2 in both cases. 5





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OPERATING SYSTEM
(B.Sc. I.T.-23)

Time allowed : Three Hours

Maximum Marks : 50

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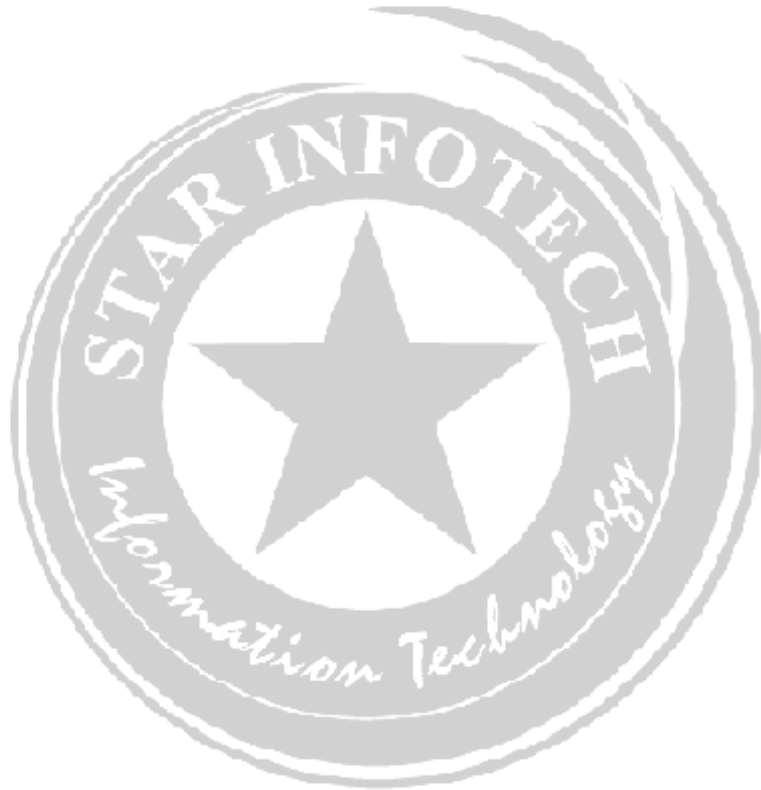
1. What is Operating System? Describe basic function of operating system with goals.
2. What is system calls? How are system calls and system programs responsible for executing process in system?
3. What is process scheduling? Describe the following characteristics of process :
 - (a) Process execution life cycle
 - (b) Process scheduler
 - (c) Process switching
4. What is process scheduling? Describe the following terms with comparison :
 - (i) Turn around time and response time
 - (ii) Multiple queue Vs. Multiple queue with feedback scheduling.
 - (iii) Long-term and short-term scheduling.
5. What is critical section problem? How this problem in two process and multiple concurrent process?

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6. Write short notes on the following :
 - (a) Three solution conditions of critical section problem.
 - (b) Starvation in concurrent process.
7. Describe addition features of Unix with shell and kernel based architecture.
8. Describe block structure of Unix. Also describe file related commands.
9. What is shell scripts ? Describe decision-making and looping statement of Unix.
10. Write a program for checking smallest value of array.





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E-COMMERCE

Time allowed : Three Hours

Maximum Marks : 50

Attempt any Five question . All questions carry equal marks.

1. What is the difference between traditional and modern business technology ?
2. Explain the role of media convergence in E-Commerce.
3. Detail out the architectural framework of E-Commerce.
4. What role is played by Mobile Computing Technology in E-Business ?
5. Explain different security issues arises in E-Commerce.
6. What is E-Payment ? Explain different modes of E-Payments.
7. Detail out EDI communication.
8. Explain technical elements and standards of EDI.
9. Write short notes on any two :
 - (1) EDI security
 - (2) Digital libraries
 - (3) Mobile data
 - (4) E-Cash
10. Explain mercantile process model.

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VISUAL BASIC PROGRAMMING

Time allowed : Three Hours

Maximum Marks : 50

Attempt any five questions. All questions carry equal marks. Draw a picture of Form and Controls wherever required.

1. (a) What is the difference between SDI and MDI interfaces ? Why, the working environment of VB is also referred to as the Integrated Development environment? (5)
(b) What do you understand about data types? What are the different data types available in VB? (5)
2. (a) What do you mean by Implicit and Explicit variable declaration ? What is control array? What is its utility? (4)
(b) Discuss the meaning and role of the following properties of a Data Control:
 - (i) Database Name
 - (ii) Exclusive
 - (iii) Record Source (6)
3. (a) How is a static array different from dynamic array? What is meant by index of

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an element ? How are indices numbered in VB?

(b) Write a Visual Basic procedure which takes a string argument and display the following :

- (1) The string in uppercase
- (2) The length of the string
- (3) The string with its first and last characters in uppercase and all the other characters in lowercase.

4. (a) What are the characteristics of MDI child forms? How do create window menu in an MDI application?
- (b) What are built functions? What are different types of built-in functions of Visual Basic?

5. (a) Write the output that the following code segment will generate :

X = "class"

Print mid(LTrim("Computer Science"),1,4) + "one"

Print (7*4 > 8+3) AND (3^2 < 6/2)

Print Val("16 Oranges") + Len(x)

Print Instr("computers","ut")

- (b) What is a Bound Control? Name any two data aware properties of bound control and explain them.
6. (a) What is the purpose of the ADO Data Control? Name the two properties of the ADO Data Control that can be dynamically set during run-time to change the database.
- (b) What is cursor? How many types of cursor recordsets are supported by ADO?
7. (a) How do you use the Windows API function GET current directory in VB application for returning the path where the windows Directory is located?
- (b) Which command type would you specify as the data source for the following requirements?
 - (i) Entire data is required.
 - (ii) A stored procedure is to be executed.



- (iii) SQL command is to be executed.
 - (iv) Source of data is unknown
8. (a) Write VB code to open a connection by :
- (i) passing connection string argument
 - (ii) setting connection string property
- and explain them with a suitable example.
- (b) Write down the difference between the following :
- (i) Picture Box and Image Box
 - (ii) Text Box and Table
 - (iii) Combo and List Box
 - (iv) Scroll Bar and Slider Bar
9. (a) Write a program to draw a Pi-chart application uses connected arcs to draw a Pi- chart application uses connected arcs to draw the pi's wedges using the different patterns also.
- (b) Write the VB code to open a text file and retrieve the controls of first line in the text file, put first three text words into three string variables.



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MULTIMEDIA BASIC

Time allowed : Three Hours

Maximum Marks : 50

Attempt any five questions. All questions carry equal marks.

1. (a) What is multimedia? Describe its uses in IT industry.
(b) Describe the structure and components of multimedia system.
2. (a) Explain comparatively the raster image format and the vector image format.
(b) What is Audio Synthesis? How can sound data be stored digitally? Explain its process.
3. Write short notes on the following (any four)
 - (i) Video capturing
 - (ii) BMP format
 - (iii) MIDI
 - (iv) Audio compression
 - (v) DVI technology
4. What are requirements of data compression? Give steps of the JPEG compression Process
Explain the lossy sequential DCT-based coding technique in detail.
5. (a) Describe audio and video data streams in MPEG. What advantages made in MPEG-2 and MPEG-4 in compare to MPEG-1?
(b) Describe speech generation and speech recognition system.

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6. Describe various steps in making a multimedia application in detail.
7. (a) Write short notes on any two of the following :
- (i) Intelligent multimedia
 - (ii) Information kiosks
 - (iii) Multimedia in office and home
- (b) Explain uses of multimedia in training and education.
8. Describe the following tags in HTML with examples :
- (i) Head and titles tags
 - (ii) Meta tag
 - (iii) Body tag
 - (iv) Form tag
 - (v) Table tags
9. (a) Write an HTML document for the following form :

Page 1	
Page 2	Frame 2
Page 3	
Page 4	
Frame 1	Frame 2

If Page 1 click then HTML Page 1 loaded in Frame 2.If page 2 click then HTML Page 2 loaded in Frame 2 and so on.

- (b) Explain various types of list tags available in HTML with suitable example.



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RELATIONAL DATABASE MANAGEMENT SYSTEM

Time allowed : Three Hours

Maximum Marks : 50

Attempt any five questions. All questions carry equal marks.

1. Explain the architecture of DDBMS and its advantages and disadvantages.
2. What is recovery? Why do we need recovery? Explain deferred-modification technique.
3. Write short notes on :
 - (a) Data mining
 - (b) Classification
 - (c) Select operation
 - (d) Multimedia Database
4. Explain Data Communication Concept.
5. What is serializability? Explain conflict and view serializability.
6. What is Data Constraint? Explain different types of constraints available in SQL.
7. Explain security specification in SQL.
8. How do we handle error in PL/SQL block?

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9. (a) Write a program in PL/SQL for inverting a number 1234 to 4321.
(b) Write a program in PL/SQL to insert a new record in student table. Assumption can be made for suitable fields.

10. (a) What is a trigger? Explain the types of trigger.
(b) Write a trigger that will insert a primary key before inserting a new record in the student table. Assumption can be made for suitable fields.

