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B. C. A. (Part III) EXAMINATION, 2013

Paper Eighth

FINANCIAL MANAGEMENT AND ACCOUNTANCY

Time : Three Hours] [*Maximum Marks : 50*

[*Minimum Pass Marks : 20*

Note : Attempt any *five* questions. All questions carry equal marks.

Unit—I

1. What is meant by GAAP ? Why is it necessary ? Explain the sources of GAAP.

Or

From the following Trial Balance of Ramesh as on 31-12-2010, prepare Final Accounts as on the above date :

Heads of Account	Debit (₹)	Credit (₹)
Capital Account	—	1,20,000
Drawings	15,000	—
Bills Receivable	22,000	—
Machinery	20,000	—
Debtors & Creditors	60,000	58,000

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Wages	39,000	—
Purchases and Sales	2,52,000	3,55,000
Commission	—	5,500
Rent & Taxes	6,000	—
Stock on 1-1-2010	90,000	—
Salaries	10,500	—
Travelling Expenses	2,000	—
Insurance	600	—
Repair	3,400	—
Bad debts	3,500	—
Furniture	9,000	—
Return	5,000	2,000
Cash in hand and bank	2,500	—
	5,40,500	5,40,500

Adjustments :

(i) Stock on hand on 31-12-2010 was ₹ 1,00,000.

(ii) Create 5% provision on debtors for doubtful debts.

(iii) Prepaid insurance amounted to ₹ 100.

(iv) Wages outstanding was ₹ 1,000.

(v) Depreciating Machinery by 5% and furniture by 10% p. a.

Unit–II

2. What is a Cash flow statement ? Explain the purpose of preparing cash flow statements.

Or

What do you mean by Costing ? Discuss the various methods of costing.

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Unit–III

3. In December, 2005 the position of ABC Ltd. was as follows :

	₹
Sales	1,80,000
Variable Cost	1,35,000
Contribution	45,000
Fixed Cost	20,000
Profit	25,000

Calculate the following :

(a) P/V Ratio

(b) Break-even point

(c) Net profit when sales are ₹ 2,00,000

(d) Sales required to earn profit of ₹ 45,000

Or

What do you mean by Ratio Analysis ? Explain the limitation of ratio analysis.

Unit–IV

4. What is Budgeting ? Explain the different types of Budgeting.

Or

The cost per unit of an article at the capacity level of 5000 units is ₹ 12·55 and the expenses are given below :

	₹
Materials	25,000
Labour	15,000
Power (80% variable)	1,250

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Repair (75% variable)	2,000
Stores	1,000
Inspection (20% variable)	500
Administration Expenses (25% variable)	5,000
Selling overhead (50% variable)	3,000
Depreciation	10,000

Prepare a flexible budget for production below and above 20% capacity level.

Unit — V

5. A product passes through three processes. The details are as follows :

Particulars	Process I	Process II	Process III
Units Introduced	10000	—	—
Cost per unit	10	—	—
Other materials (₹)	24,000	30,000	20,000
Labour (₹)	75,000	80,000	90,000
Overheads (₹)	50,000	40,000	30,000
Normal Loss	5%	8%	10%
Scrap value per unit (₹)	4	10	15
Actual Output (units)	9300	8700	7800

Prepare Process Accounts.

Or

What is variable costing ? Explain how variable costing is a tool of decision-making.

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B. C. A. (Part III) EXAMINATION, 2013

Paper First

CALCULUS AND GEOMETRY

Time : Three Hours]   [*Maximum Marks : 50*

Note : All questions are compulsory. Attempt any *two* parts from each question. All questions carry equal marks.

Unit – I

1. (a) If $f \in R\,[a, b]$, then prove that $|f| \in R\,[a, b]$ and :

$$\left| \int_a^b f \right| \le \int_a^b |f|$$

(b) Let $f \in R\,[a, b]$ and let $F : [a, b] \to R$ be defined by :

$$F(x) = \int_a^x f(t)\, dt,\ a \le x \le b.$$

Then prove that F is differentiable at any point $c \in [a, b]$ at which f is continuous, and :

$$F'(c) = f(c)$$

(c) Prove that :

$$\lim_{n \to \infty} \left\{ \frac{1}{n+1} + \frac{1}{n+2} + \frac{1}{n+3} + \cdots\cdots + \frac{1}{2n} \right\}$$
$$= \log 2$$

Use integral as a limit of sum.

Unit—II

2. (a) Discuss the maximum and minimum value of the function :

$$u = xy + \frac{a^3}{x} + \frac{a^3}{y}$$

(b) Find the maximum and minimum of the function :

$$u = \sin x \sin y \sin (x + y)$$

(c) Find the maximum value of the function $x^p y^q z^r$ subject to the condition :

$$ax + by + cz = p + q + r$$

Unit—III

3. (a) Test the convergence of integral $\int_{-\infty}^{0} e^{-x} dx$ and hence test $\int_{-\infty}^{\infty} e^{-x} dx$.

(b) Show that the integral $\int_{0}^{\infty} \frac{dx}{(1+x)\sqrt{x}}$ is convergent.

(c) Test the convergence of the integral :

$$\int_{a}^{\infty} \frac{\sin x}{x^n} dx, n > 0$$

Unit—IV

4. (a) The plane $\frac{x}{a} + \frac{y}{b} + \frac{z}{c} = 1$ meets the co-ordinate axes in A, B, C. Prove that the equation of the cone generated by lines drawn from O meet the circle ABC is :

$$yz\left(\frac{b}{c} + \frac{c}{b}\right) + zx\left(\frac{c}{a} + \frac{a}{c}\right) + xy\left(\frac{a}{b} + \frac{b}{a}\right) = 0$$

(b) Find the equation to the right circular cone whose vertex is P $(2, -3, 5)$, axis PQ which makes equal angles with the axes and which passes through A $(1, -2, 3)$.

(c) Find the equation of the quadric cylinder with generators parallel to x-axis and passing through the curve :

$$ax^2 + by^2 + cz^2 = 1$$
$$lx + my + nz = p$$

Unit—V

5. (a) Prove that the polar equation to the circle described on straight line joining the points $(1, 60°)$, $(2, 30°)$ as diameter is :

$$r^2 - r[\cos(\theta - 60°) - 2\cos(\theta - 30°)] + \sqrt{3} = 0$$

(b) Find the polar co-ordinates of foot of the perpendicular from the poles on the line joining the point (r_1, θ_1) and (r_2, θ_2).

(c) Prove that the line :

$$\frac{l}{r} = A\cos\theta + B\sin\theta$$

is a tangent to the conic :

$$\frac{l}{r} = 1 + e\cos(\theta - \alpha)$$

if :

$$A^2 + B^2 - 2b(A\cos\alpha + B\sin\alpha) + (e^2 - 1) = 0$$

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Paper Third

COMPUTER SYSTEM ARCHITECTURE

Time : Three Hours]   [*Maximum Marks : 50*

Note : Attempt all the *five* questions. *One* question from each
Unit is compulsory. All questions carry equal marks.

Unit—I

1. Explain the following :

    (i)   Error correcting codes

    (ii) EBCDIC codes

    (iii) BCD codes

    (iv) Grey codes

Or

Solve the following binary arithmetic :

(i)   Multiply $(1100)_2$ by $(1010)_2$

(ii) $(11101)_2 - (11010)_2$

(iii) Divide $(10010)_2$ by $(110)_2$

(iv) Divide $(1101)_2$ by $(101)_2$

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Unit–II

2. (a) Explain Half adder and Full adder in brief.

   (b) Explain RS, D and JK Flip-Flop.

Or

Explain the following in brief :

(a) Shift register

(b) Logic gates

Unit–III

3. (a) Draw block diagram of a macro computer system and brief each component.

   (b) Explain the following :

      (i) Program counter

      (ii) System buses

Or

Write short notes on the following :

(a) Microprocessor

(b) Interfacing devices

Unit–IV

4. (a) What are the properties of simple I/O devices and their controller ?

   (b) What do you mean by Input/Output processor ?

Or

Explain the following in brief :

(a) Handshaking

(b) Synchronous and Asynchronus Data Transfer

Unit–V

5. Explain the concept of address space and memory space, address mapping in detail.

Or

Write short notes on the following :

(a) Virtual memory

(b) Cache memory

(c) Associative memory

(d) Hit ratio

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B. C. A. (Part III) EXAMINATION, 2013

Paper Second

DIFFERENTIAL EQUATION AND FOURIER SERIES

Time : Three Hours]   [*Maximum Marks : 50*

Note : Attempt any *two* parts from each question. All questions carry equal marks.

Unit – I

1. (a) Solve :

$$\frac{dy}{dx} = e^{x-y} + x^2 e^{-y}$$

(b) Solve :

$$\frac{dy}{dx} = \frac{2x + 9y - 20}{6x + 2y - 10}$$

(c) Solve :

$$(px - y)(py + x) = h^2 p$$

Unit – II

2. (a) Find the orthogonal trajectories of the family of curves :

$$ax^2 + y^2 = 1$$

a being parameter of the family.

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(b) Solve :

$$\frac{d^2y}{dx^2} - 5\frac{dy}{dx} + 6y = e^{4x}$$

(c) Solve :

$$x^2\frac{d^2y}{dx^2} + 5x\frac{dy}{dx} + 4y = x\log x$$

Unit—III

3. (a) Using Lagrange's method solve :

$$xzp + yzq = xy$$

(b) Solve :

$$q - p + x - y = 0$$

(c) Solve :

$$\frac{\partial^2 z}{\partial x^2} - a^2\frac{\partial^2 z}{\partial y^2} = x^2$$

Unit—IV

4. (a) Obtain the Fourier series of the following function :

$$f(x) = x + x^2$$

in the interval $(-\pi, \pi)$. Hence deduce that :

$$\frac{\pi^2}{6} = 1 + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \dots\dots\frac{1}{n^2} + \dots\dots$$

(b) Expand $f(x) = |\cos x|$ in Fourier series.

(c) Expand the following function in sine series :

$$f(x) = \begin{cases} x, & \text{when } -0 \le x \le l/2 \\ l - x, & \text{when } l/2 < x < l \end{cases}$$

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Unit—V

5. (a) Discuss convergence of Fourier series with an example.

(b) Discuss the Gibbs phenomenon for the function :

$$f(x) = \begin{cases} 1, & -\pi < x < 0 \\ -1, & 0 \le x < \pi \end{cases}$$

(c) Write applications of Fourier series to differential equation with examples.

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Paper Ninth

(Foundation Course)

ENGLISH LANGUAGE

Time : Three Hours] [*Maximum Marks : 50*
[*Minimum Pass Marks : 20*

Note : Attempt all questions. All questions carry equal marks.

Unit—I

1. Answer any *two* of the following questions in about 200 words each : 10

   (a) Write a summary of the short story 'Death of a Clerk' in our own words.

   (b) Why does Lucas say that everybody at sometime is a bore ?

   (c) What does Information Technology deal with ?

   (d) How are basic human needs and quality of life interrelated ?

Unit—II

2. Write an essay on any *one* of the following : 10

   (i) Write Role of women in Society

   (ii) Computer Revolution in India

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(iv) My sister is .... enough to believe anything you tell her. (credible, credulous)

(v) I am afraid the project is far too expensive to be .... (practical, practicable) .

(b) Do as directed any *five* of the following : 5

(i) Take .... umbrella with you to office. It may rain any time. (suitable articles)

(ii) Everyone from the surrounding villages .... hurt during the earthquake of Gujrat.

(iii) I won't go to the door............... I hear the bell. (if/unless)

(iv) It was .... I was talking about.

(v) The giant was very selfish, ... ?

(Put question tag)

(vi) You would not like to open the door, ... ? (Put question tag)

(vii) By whom was that letter written ?

(Change the Voice) .

(viii) She was dismissed from service.

(Change the Voice)

(ix) He was accused .... murder.

(Supply preposition)

(x) I know a man .... eats raw vegetables.

(Add the missing relative)

(iii) In Future of Democracy in India

(iv) The Janlokpal Movement

Unit – III

3. Make a precis of the following passage and give suitable title to it :   10

With the spread of literacy, especially in those advanced countries where education in compulsory, libraries are as necessary as water supply or lighting arrangement. There was a time not very long ago, when the knowledge of books was confined to a very select class of men who were well off in the worldly goods. This alone were able to buy the necessary books for their instruction and delight. But the greater part of the population of a city are composed of those who live from hand to mouth. They do not have the means to buy books. To this class the benefits of a free library are truly great. Again a person though not badly off cannot be expected to buy all the books that interest him. There are many costly books which it would be beyond the competence of most persons to buy. The want felt for such expensive volumes can only be met by a library.

Unit – IV

4. Read the following passage carefully and answer the questions that follow :   10

Man is the most paradoxical of all animals. On the one hand, he is the most imaginative and creative creature. On the other hand, he is the most dangerous and destructive of all animals. He has destroyed much

of the creation. Toxic chemicals are still poisoning the world ground as although we know of the dangers. Man's greed has brought the great whale to the verge extinction. Plants and animals which share the earth with mankind are current products of an endless process of evolution. They were shaped by their environment. All animals are products of their habitat. They are our heritage, the natural part of our environment and we have a simple duty to look after them for the generation that will follow us.

Questions :

(i) Why is man called the most paradoxical of all animals ?

(ii) What are the dangers to which toxic chemicals expose us ?

(iii) What has led to the near extinction of the great whales ?

(iv) What is our simple duty towards our heritage ?

(v) Write a suitable title to the passage.

Unit – V

5. (a) Fill in the blanks with appropriately chosen words from the following :   5

(i) Do you think the new tax laws will .... you very much.   (affect, effect)

(ii) His behaviour at the party was .... to say the least.   (contemptuous, contemptible)

(iii) Her solo performance was ....

(judicious, judicial)

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Paper Fourth

PROGRAMMING IN JAVA

Time : Three Hours]　　　　　　[Maximum Marks : 100

Note : Attempt any *two* parts from each question. All questions carry equal marks.

1. (a) Why is Java called platform independent language ? Explain the features of Java.

   (b) What is an Array ? How is it declared and accessed ? Write a program to generate the following multi-dimensional array :

      0

      1 2

      3 4 5

      6 7 8 9

   (c) Explain StringBuffer class. Write a program to generate output : "Raipur is part of MP" then replace word "is" by "was" to generate the sentence "Raipur was part of MP", by the use of method of StringBuffer class.

2. (a) Explain the different types of inheritance supported by Java with suitable programming example.

   (b) Explain interface in Java. Write a program using interface and then make a class that implements the interface.

   (c) Explain the difference between method overloading and method overriding with suitable example.

3. (a) Explain exception. How can it be handled with the help of try-catch statement ? Give suitable program in Java.

   (b) Explain multithreading in Java. Write a suitable program for creation of thread.

   (c) Write short notes on the following :

      (i) thread priorities

      (ii) suspending and resuming of threads

4. (a) Explain Reading console input. Write a program to read characters from the console using Buffered-Reader class.

   (b) Write a short note on TCP/IP client socket and URL connection.

   (c) Write the steps for setting the JDBC connectivity with databases.

5. (a) Explain how a simple applet can be created. Give suitable program, compiling command and execute it by applet viewer.

   (b) Briefly describe the different types of controls supported by AWT.

   (c) Demonstrate the mouse event handlers by Delegation Event Model (specify any *five* mouse events).

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Paper Seventh

MULTIMEDIA TOOLS AND APPLICATION

Time : Three Hours]　　　　　　　[*Maximum Marks : 50*

[*Minimum marks : 20*

Note :　Attempt any *two* parts from each Unit. All questions carry marks.

Unit–I

1. (a) What are the features of multimedia tool ? What are the software drivers for multimedia support ?

　(b) Explain image editing tools in detail.

　(c) Explain how the video is used in multimedia application.

Unit–II

2. (a) Write the steps of capturing and editing any sound file on PC.

　(b) What are the principles of animation in Multimedia ? How to create a animation file in multimedia ?

　(c) What is web ? Explain how to import a flash file in web page.

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Unit-III

3. (a) What is video compression technique ? Compare AVI and MPEF formats.

   (b) What are video standard ? Explain the working of HDTV technology.

   (c) Explain digitization of analog video to digital video in detail.

Unit-IV

4. (a) What is DVD ? How is DVD differ from CDs ?

   (b) Explain with neat diagram the various functions of multimedia development systems.

   (c) What issues for evaluation do you apply in selecting and purchasing multimedia products ?

Unit-V

5. (a) Write a HTML code to edit and run the audio file.

   (b) What is Image Map ? Explain with an appropriate example.

   (c) Outline the different techniques that can be used for tracking user movements in VR applications, and compare their benefits and limitations.

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Paper Fifth

COMPUTER OPERATING SYSTEM

Time : Three Hours]
　　　　　　　[*Maximum Marks : 100*
　　　　　　　[*Minimum Pass Marks : 40*

Note : All questions are compulsory. All questions carry equal marks. Attempt any *two* parts from each question.

Unit – I

1. (a) What is an Operating System ? Discuss in detail how the OS can be classified into different categories.

   (b) List the differences between multiprogramming and time-sharing system.

   (c) Explain the various functions of an operating system.

Unit – II

2. (a) What do you mean by CPU Scheduling ? Explain the various levels of CPU scheduling.

   (b) Explain with example the Shortest Job First (SJF) scheduling and Round Robin scheduling algorithms.

   (c) List the various states of a process and draw the block diagram of state diagram.

Unit—III

3. (a) What is paging in operating system ? Explain using example.

   (b) Explain any *two* page replacement algorithms.

   (c) Explain any disk scheduling algorithm.

Unit—IV

4. (a) Explain in detail about contiguous, linked and indexed file allocation methods.

   (b) Explain the various file access methods.

   (c) Discuss about file system implementation.

Unit—V

5. (a) What is a Deadlock ? How to handle it ?

   (b) Explain how Banker's algorithm is used in deadlock avoidance using suitable example.

   (c) Explain the difference between deadlock prevention scheme and deadlock avoidance schemes.

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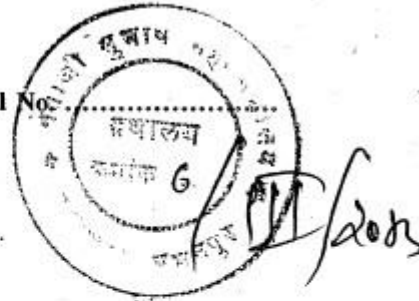
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Paper Sixth

SOFTWARE ENGINEERING

Time : Three Hours]　　　　　　　　[*Maximum Marks : 100*

　　　　　　　　　　　　　　　　[*Minimum Pass Marks : 40*

Note : Attempt any *two* parts from each question. All questions carry equal marks.

1. (a) What are the major aspects in development of project that follows the prototyping model ?

   (b) Explain software engineering problems with its key element.

   (c) What are the key components for Software Engineering ?

2. (a) What is Software Metrics ? What is the role of metrics in project management and process management ?

   (b) What are the quality metrics needed to assess the quality of the SRS ?

   (c) What are requirement based metrics ? Explain size metrics for requirement.

3. (a) What are the major characteristics of a good S for a system ?

(b) What is Software Requirement ? Why requirement specification is important in software designing ?

(c) What is the role of DFD for software requirement specification ? Draw a DFD for a system that pays workers.

4. (a) What do you mean by the term Module ? Explain the two modularization criteria : cohesion and coupling.

(b) Explain structured chart for a function-oriented design. Draw the structure chart for sorting program.

(c) Explain the following two approaches to design hierarchy of component :

(i) Top down strategy

(ii) Bottom up strategy

5. (a) What is Test Oracle ? Explain in detail. Why is it necessary for testing ?

(b) Explain functional testing and structural testing in detail.

(c) What are the basic levels of Testing ? Why different levels of testing are used in the testing process ?