2006

Full Marks: 70

NB-BCA-I(CS-60)
Time: 3 Hours

Candidates are required to give their answers in their own words as far as practicable.

Attempt any ***five*** questions.

1. (a) Which of the following functions are even, which are odd, and which are neither even nor odd?

(i) $x \to x^2 + 1, \forall x \in \mathbf{R}$ (ii) $x \to x^3 - 1, \forall x \in \mathbf{R}$ (iii) $x \to \cos x, \forall x \in \mathbf{R}$

(iv) $x \to x\,|x|, \forall x \in \mathbf{R}$ (v) $f(x) = \begin{cases} 0, & \text{if } x \text{ is rational} \\ 1, & \text{if } x \text{ is irrational} \end{cases}$

(b) Let us evaluate $\lim_{x \to 2} \frac{3x^2 + 4x}{2x + 1}$

(c) Prove that (i) $\lim_{x \to 3^-} x\,[x] = 1$ (ii) $\lim_{x \to 0^+} \frac{|x|}{x} = 1$ (iii) $\lim_{x \to 0^-} \frac{(x^2 + 2)|x|}{x} = -2$

2. Differentiate the following, using Theorem 1. (Derivative of a Scalas multiple of a function)

(i) $(5/3)x^3$ (ii) $8\sqrt{x}$

3. Find the derivatives of the following:

(i) $\sin 2x$ (ii) $\cos^2 x$ (iii) $5 \sin^7 x \sin 3x$ (iv) $x^3 \cos 9x$ (v) $\cos(\sin x)$

4. Find the n^{th} derivative of the following functions:

(i) $f(x) = (ax+b)^3$ (ii) $f(x) = (ax+b)^m$ (iii) $f(x)=e^x$ (iv) $f(x)=e^{kx}$

5. (i) State Leibniz Theorem when $n = 5$. That is, $(u.v)_5$=?

(ii) Prove that when $n = 1$, Leibniz Theorem reduces to the product rule of differentiation.

6. (i) Find the upper product sum and the lower product sum of the function f relative to the partition P, when

(a) $f(x) = 1+x^2$, $P=\{0, 1/2, 1, 3/2, 2\}$ (b) $f(x)=1/x$, $P=\{1,2,3,4\}$

(ii) Use corollary 1 to evaluate the following definite integral. $\int_0^2 (1+x)\,dx$

7. (i) Which of the following functions are increasing on the interval given? Which of them are decreasing?

(i) $x^2 - 1$ on $[0, 2]$ (ii) $2x^2+3x$ on $[-1/2, 1/2]$ (iii) e^{-x} on $[0, 1]$

(iv) $x(x-1)(x+1)$ on $[-2,-1]$ (v) $x \sin x$ on $[0, \pi/2]$ (vi) $\tan x + \cot x$ on $[0, \pi/4]$

8. (a) Obtain the modulus and argument of $1+i$.

(b) Obtain z, if $|z| = 2$ and Arg $z = = \pi/3$

9. If α, β, γ are the roots of the equation $x^3 - 7x^2 + x - 5 = 0$ find the equation whoe roots are $\alpha+\beta, +\gamma, \alpha+\gamma$.

10. Find solutions (if any) of the following sets of simultaneous equations by the substitution method.

(a) $x+y= -2$ $y=3$ (b) $3a + 7b = 33$ $a+ 3b = 13$ (c) $2s+t=20$ $2s-5t=30$

(d) $x+y=2$ $2x+2y=4$ (e) $3x=y+5$ $9+y=3x$

2006

NM- BCA (CS-610)

Full Marks-75

Time : 3 Hours

Candidates are required to give their answer in their own words as far as practicable.

1. ***Read the passage carefully and answer briefly the questions appended below:-***

Science and the techniques to which it has given rise have changed human life during the last hundred and fifty years more than it had been changed since men took to agriculture, and the changes that are being wrought by science continue at an increasing speed. There is no sign of any new stability to be attained on some scientific plateau. On the contrary, there is every reason to think that the revolutionary possibilities of science extend immeasurably beyond what has so far been realized. Can the human race adjust itself quickly enough to these vertiginous transformations, or will it, as innumerable former species have done, perish from lack of adaptability? The dinosaurs were, in their day, the lords of creation, and if there had been philosophers among them, not one would have foreseen that the whole race might perish. But they became extinct because they could not adapt themselves to a world without swamps. In the case of man and science there is a wholly new factor, namely that man himself is creating the changes of environment to which he will have to adjust himself with unprecedented rapidity. But, although man through his scientific skill is the cause of the changes of environment, most of these changes are not willed by human beings. Although they come about through human agencies, they have, or at any rate have had so far, something of the inexorable inevitability of natural forces. Whether Nature dried up the swamps or men deliberately drained them, makes little difference as regards the ultimate result. Whether men will be able to survive the changes of environment that their own skill has brought about is an open question. If the answer is in the affirmative, it will be known some day; if not, not. If the answer is to be in the affirmative, men will have to apply scientific ways of thinking to themselves and their institutions.

One of the most obvious problems raised by a scientific technique is that of the exhaustion of the soil and of raw materials. This subject has been much discussed and some governments have actually taken some steps to prevent the

...ion of the soil. But I doubt whether, as yet, the good done by these ...easures is outweighing the harm done in less careful regions. Food, however, is such an obvious necessity that the problem is bound to receive increasing attention as population pressure makes it more urgent. Whether this increased attention will do good or harm in the long run is, I fear, questionable. By a spendthrift use of fertilizers, food production in the present can be increased at the cost of food production in the future.

The question of raw materials is more difficult and complex than the question of food. The raw materials required at one stage of technique are different from those required at another. It may be that by the time the world's supply of oil is exhausted atomic power will have taken its place. But to this sort of process there is a limit, though not an easily assignable one. At present there is a race for uranium, and it would seem likely that before very long there will be no easily accessible source of uranium. If, when that happens, the world has come to depend upon nuclear energy as its main source of power, the result may be devastating. All such speculations are of course very questionable, since new techniques may always make it possible to dispense with formerly necessary raw materials. But we cannot get away from the broad fact that we are living upon the world's capital of stored energy and are transforming the energy at a continually increasing rate into forms in which it cannot be utilized. Such a manner of life can hardly be stable, but must sooner or later bring the penalty that lies in wait for those who live 'on capital.

In primitive times, when the human population of the globe was small, such problems did not arise. Agriculture, it is true, was practised in ways that exhausted the soil for a time, but there were usually new vacant lands available; and if there were not" the corpses of enemies sufficed as fertilizers. The system was 'conservative' in the physicists' sense. That is to say, energy on the whole accumulated as fast as it was used. Now, this is not the case; and, so far as one can see. it will never be the case while scientific technique continues.

- (Bertrand Russell)

Questions

a) Choose a suitable title for the above mentiond passage -1

b) Science has brought about a rapid change in human life. What question does it give rise to? -5

c) The author referes to one of the problems raised by scientific technique. What question does it give rise to? -5

d) How can food production be increased? what effect will it have in the future. Why do you think so? - 5

e) What will be a possible substitute if the world's supply of oil is exhausted? - 5

f) Man will be punished for living on 'capital'. What capital is the author talking about? - 5

2. Give the meaning of the following :
Vitiate, Novel, Amoral, Prejudices, Elimination, Obsolete, Lex. -7

3. *(a)* ***Fill in the blanks in the following sentences using the verbs given below, add ing to each verb before using it.*** *1x5 =5*

Revole, Smile, Slide, Nag, Move.

(i) We need a _____ door here

(ii) He had a serious accident while getting off a _____ bus.

(iii) A _____ chair is better than an ordinary one, but it is much more expensive.

(iv) It is as uncommon for a peevish person to have a _____ face as it is for a cheerful person to have a peevish one.

(v) His wife is always complaining about something. No wonder people call him the husband of a _____ wife.

(b) Fill in the blanks in the sentences below with the following verbs in the correct form. *1x5=5*

(i) Before he left for the tour, he _____ (take) trouble to arrange for all that would be needed.

(ii) They _____ (complete) the construction of the house when we arrived.

(iii) I _____ not yet (arrive) at a solution to the problem.

(iv) He _____ (write) the letter to his secretary?

(v) The wind _____ (blow) all the dried leaves to one side of the road.

4. Write a composition in about 500 words on any one of the following topics. - 10

(a) The Goal of higher (b) Unemployment

(c) Liberalisation (d) Social Justice

5. Write a paragraph not exceeding 100 words on any two of the following topics : - 8

(a) The Importance of Cyber Laws (b) Microsoft

(c) Yahoo.com (d) http.w.w.w.

6. Match the name of the specialist in the left hand column with his speciality in the right hand column. - .5X8 = 4

	Name	*Speciality*
i	Ophthalmologist	Women's diseases
ii.	Neurologist	Nature of diseases
iii.	Cardiologist	Skin
iv.	Dermatologist	Mental illness
v.	Gynaecologist	Illness of children
vi.	Pathologist	Nerves
vii.	Psychiatrist	Heart
viii.	Paediatrician	Eyes

7. ***Fill the blanks in the following sentences by using the appropriate words from the list given below:*** - 10

Monster computer *Micro computer*

Alalog computer *Main fraim computer*

Digital computer *Mini computer*

(i) A computer that measures continuously changing data such as speed and chemical composition is called an _____.

(ii) The largest, fastest and most expensive class of computers is known as_____.

(iii) A_____ is distinguished from a main frame computer by small size, lower cost and less data handling capacity.

(iv) A _____ manipulates discontinuous data and performs arithmetic and logic operations an such data.

(v) _____ is a large, expensive computer generally used for information processing in large business organisation.

✦ ✦ ✦

2006

NM-BCA-I(CS-612)

Full Marks-75

Time : 3 Hours

Candidates are required to give their answer in their own words as far as practicable.

Answer all the questions.

1. (a) What is Internet? Explain the working of internet.
   (b) Explain DNS.

2. What is e-mail? What are the advantages of e-mail.

3. Write short notes on the following:
   (a) Telnet
   (b) FTP
   (c) WWW
   (d) Downloading

4. What are the features of MS-Excel? What are different types of data that can be stored in worksheet cells.

5. What is a Macro? Write the importance of creating a macro.

✦ ✦ ✦

2006

NB.BCA-I(FHS-0I)

t Reserve

Time :3. Hours

rks : 70

Candidate are required to give their answers in their own words as for as practicable.

<u>किन्हीं पाँच प्रश्नों का उत्तर दीजिए।</u>

<u>Answer any **Five** questions.</u>

1. Discuss the importance of the study of foundation course in Humanilies and Social Science.
   मानविकी एवं समाज विज्ञान में आधारभूत पाठ्यक्रम के अध्ययन के महत्व की विवेचना कीजिए।
2. Examine the concept of the integration of knowledge.
   ज्ञान के एकीकरण की अवधारणा का परीक्षण कीजिए।
3. Discuss the evolution and growth of Feudal System.
   सामन्तवादी व्यवस्था के उद्भव एवं विकास कह विवेचना कीजिए।
4. Discuss the socio-religious reforms in India.
   भारत में सामाजिक-धार्मिक सुधारों की विवेचना कीजिए।
5. Discuss the features of the Preamble of the Constitution of India.
   भारतीय संविधान की प्रस्तावना की विशेषताओं की विवेचना कीजिए।
6. Examine the Fundamental Rights guaranted under the Indian Constitution.
   भारतीय संविधान के अन्तर्गत प्रत्याभूत मौलिक अधिकारों का विवेचन कीजिए।
7. Examine the recommendations of either **Ashok Mehta Committee Report** or **Balwant Rai Mehta Committee Report** on democratic decentralisation in India.
   भारत में प्रजातांत्रिक विकेन्द्रीकरण पर **अशोक मेहता समिति प्रतिवेदन** या **बलवन्त राय मेहता समिति प्रतिवेदन** की अनुशंसाओं का परीक्षण कीजिए।
8. Write an essay on the working of Panchayati Raj system in Bihar.
   बिहार में पंचायती राज प्रणाली के कार्यकरण पर एक निबंध लिखिए।

9. Discuss the place of women in Indian society.
भारतीय समाज में नारियों की स्थिति की विवेचना कीजिए।

10. Write short notes on any Two of the following :-
अद्योलिखित में से किसी दो पर संक्षिप्त टिप्पणियाँ लिखिए :-

(1) Planning Commission of India.
भारत का योजना आयोग

(2) Below Poverty line Population.
भारत में निर्धनता रेखा से नीचे की जनसंख्या

(3) National Integration.
राष्ट्रीय एकीकरण

(4) Jawarhar Lal Nehru 's outlook on Secularism.
पंथ निरपेक्षवाद पर जवाहर लाल नेहरू का दृष्टिकोण

2006

NB-BCA(I)(CS-611)

Time: 3 Hours

Full Marks: 60

Candidates are required to give their answers in their own words as far as practicable.

Answer **Five** questions.

1. Discuss Von Neumann architecture. Draw the structure of Von-Neumann machine.
2. Explain the following terms:
   (a) Microprocessors
   (b) Integrated Circuit (IC)
   (c) Laptop
   (d) BUS
3. Compare and Contrest the following:
   (a) Volatile versus Non-Volatile memory
   (b) Static verus dynamic memories.
   (c) Magnetic Disk versus Winchester Disk
4. What is cache Memory and how it is different from RAM? Why Cache Memory is also called High speed Memory?
5. What do you understand by vector processing? Name any five application are a where vector processing is used.
6. Define the following:
   (a) RISE (b) CISC
   (c) Pipelining (d) Distributed operating System
7. What do you understand by LAN Topology? Discuss Star, BUS and Ring Topology with the help of a diagram.
8. Discuss seven layers of the OSI reference model.
9. Define virus. What are the three categories of viruses? Explain how virus infection takes phase in a computer and method of its prevention.
10. Differentiate between:
    (a) EDI and E-Mail
    (b) Cryptography and Cyptanalysis
    (c) Bridges and Routers
    (d) Co-axial Cable and Optical Fibre Cable