

NALANDA OPEN UNIVERSITY

Main Examination, 2007

N-BCA-I(CS-60)

Full Marks: 75

Time: 3.00 Hrs.

Answer any Five questions.

1. (i) Show that the function $f: X \rightarrow X$ such that $f(x) = \frac{x+1}{x-1}$, where X is the set of all real numbers except 1, is one-one and onto. Find its inverse.
 (ii) Which of the following functions are onto?
 (a) $f: \mathbb{R} \rightarrow \mathbb{R}$ defined by $f(x) = 3x + 7$
 (b) $f: \mathbb{R}^+ \rightarrow \mathbb{R}$ defined by $f(x) = \sqrt{x}$
 (c) $f: \mathbb{R} \rightarrow \mathbb{R}$ defined by $f(x) = x^2 + 1$
 (d) $f: X \rightarrow \mathbb{R}$ defined by $f(x) = 1/x$
 where X stands for the set of non-zero real numbers.
2. (i) Show that $\lim_{x \rightarrow 1} \frac{3}{x} = 3$
 (ii) Calculate $\lim_{x \rightarrow 1} 2x + 5 \left(\frac{x^2}{1+x^2} \right)$
3. Find the equation of the tangent to each of the following curves at the point (x_0, y_0) .
 (a) $x^2 + y^2 + 4x + 6y - 1 = 0$
 (b) $xy = a$
4. Verify the mean value theorem on the interval $[0, 2]$ for the following functions
 (a) $f(x) = \sin \pi x$
 (b) $f(x) = 2x^2 + 3$
5. Evaluate the following integrals by using FTC
 (a) $\int_1^3 2x^3 dx$ (b) $\int_1^3 (2x^2 + 2x + 1) dx$ (c) $\int_1^2 x(x+1)^2 dx$
6. Find the area of the curve
 $x = a(3 \sin \theta - \sin^3 \theta)$, $y = a \cos^3 \theta$, $0 \leq \theta \leq 2\pi$.
7. Show that if $A \subseteq B$ and $B \subseteq C$, then $A \subseteq C$. This shows that ' \subseteq ' is a transitive relation.
8. Which of the following linear systems are consistent? Obtain the solution sets, wherever possible.
 (a) $2x - 5y + 7z = 6$
 $x - 3y + 4z = 3$
 $3x - 8y + 11z = 11$
 (b) $x - 2y + z = 6$
 $3x + y - 4z = 7$
 $5x - 3y + 2z = 5$
9. (a) Show that the equation of a conic with focus at $(0, 0)$, directrix $x + c = 0$ and eccentricity $e > 1$ is

$$\left(x + \frac{ce^2}{e^2 - 1} \right)^2 - \frac{y^2}{e^2 - 1} = \frac{e^2 c^2}{(e^2 - 1)^2}$$

 (b) Shift the origin suitably so as to get the equation $\frac{x'^2}{a^2} - \frac{y'^2}{b^2} = 1$,
 where $a = \frac{ec}{e^2 - 1}$, $b = a \sqrt{e^2 - 1}$
10. Obtain the transformed equation of the following equations when the origin is shifted to $(1, -3, 2)$.
 (a) $x^2 + y^2 + z^2 - 4x + 6y - 2z + 5 = 0$
 (b) $x^2 - 2y^2 - 3z = 0$

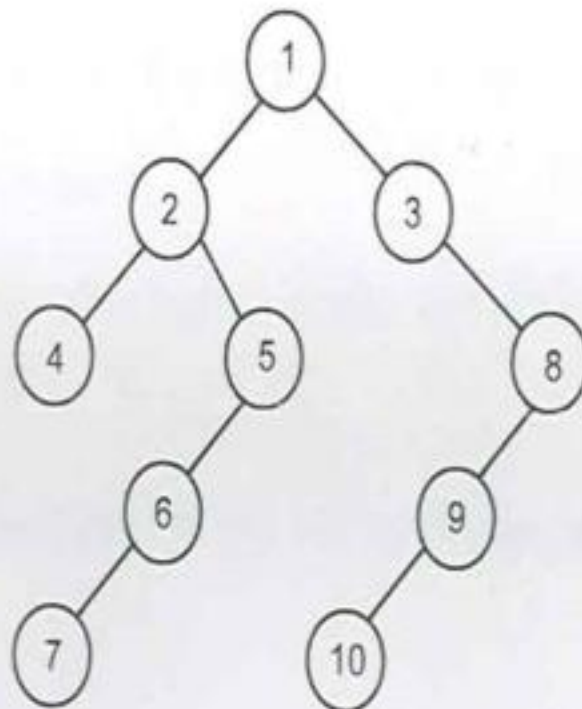
NALANDA OPEN UNIVERSITY
Main examination, 2007

N-BCA(CS-62)
Full Marks: 60

Time: 2.00 Hrs.

Answer Any Five Questions.

1. What is Stack? Explain with a figure various operations applicable to Stack.
2. (a) Write Prefix form of the following expression
 - (i) $a/b+c*d$ (ii) $a+b*c/d$
 - (b) Explain the use of Pointers.
3. Write a program to add a node at beginning in link list.
4. Write a program to arrange 10 numbers in ascending order.
5. What is Heap? Explain process of Heap Sort with an Example.
6. Write a program to create quene and perform insert and delete operation.
7. Write short notes on the following:
 - (a) Use of Array
 - (b) Indexed sequential file
 - (c) Binary Tree
8. Traverse the following Binary Tree in Preorder, Postorder & Inorder.



9. Write a program to find the Minimum and Maximum element in Linked Lst.
10. Explain with example Binary Search Tree. Explain also Preorder, Inorder & Postorder Traversal Process.

NALANDA OPEN UNIVERSITY
Main examination, 2007

N-BCA(CS-611)
Full Marks: 60

Time: 3.00 Hrs.

Answer Any Five Questions.

1. Define the following:
 - (a) LAN
 - (b) GATEWAYS
 - (c) EDI
 - (d) MULTIMEDIA
2. Write about the following:
 - (a) Micro Computer
 - (b) Mini Computer
 - (c) Mainframe
3. Why memory is required in Computer System? Write about different group of memories in a memory system.
4. What are output devices available? Write the difference between Laser and Dot Matrix printers.
5. What is an Operating System? Write about Network Operating System and Batch Operating System.
6. Define Computer Security. Write about possible breaches of security for PC users.
7. What is GUI? How does MS-Window enhances DOS?
8. What is Internet? Write about e-mail and its advantages.
9. What is protocol? Write about Simplex and Half-Duplex Communication.
10. What is a Computer Virus? What functions are performed by anti-viral programs?

Time: 3.00 Hrs.

Answer any five questions.

किन्हीं पाँच प्रश्नों के उत्तर दीजिए।

1. Discuss the consequences of the Sepoy Mutiny of 1857
1857 के सिपाही विद्रोह के परिणामों का विवेचन कीजिए।
2. What is secularism? Discuss the provisions of the Indian Constitution concerning Secularism.
बंध निरपेक्षवाद क्या है? पंथ निरपेक्षवाद से सम्बन्धित भारतीय संविधान के प्रावधानों की चर्चा कीजिये।
3. Discuss the concept of a Welfare State.
एक लोक कल्याणकारी राज्य की अवधारणा का विवेचन कीजिए।
4. Examine the functions of the Planning Commission of India.
भारत के योजना आयोग के कार्यों का परीक्षण कीजिये।
5. Discuss the characteristics of the Tribal Cultures in India.
भारत में जनजातीय संस्कृतियों की विशेषताओं का विवेचन कीजिये।
6. Discuss the Legislative relations between the Centre and States in India.
भारत में केन्द्र एवं राज्यों के मध्य विधायी सम्बन्धों की समीक्षा कीजिये।
7. Examine the working of a Gram Panchayat in Bihar.
बिहार में एक ग्राम पंचायत के कार्यकरण का परीक्षण कीजिये।
8. Discuss the importance of People's participation in Democracy.
लोकतंत्र में जनसहभागिता के महत्व का विवेचन कीजिये।
9. Write an essay on "The Problems of Peace' in Nuclear World" or "Environmentalism".
आणविक विश्व में शांति की समस्या अथवा पर्यावरणवाद पर एक निबंध लिखिये।

10. Fill up the Blanks (रिक्त स्थानों की पूर्ति कीजिये)

Answer all questions (सभी प्रश्नों के उत्तर दीजिए।)

- (i) The Iron Age commenced at around _____ B.C.
- (ii) Noumena is the feature associated with _____.
- (iii) Australopi thecine means _____.
- (iv) Laissezfaire denotes _____.
- (v) Indian Vernacular Press Act was passed in the ____ year
- (vi) The decision to partition the province of Bengal was announced on _____.
- (vii) Mass Ghadar Party (Rebellion Party) was organised in _____.
- (viii) Narayan Guru fought the battle against _____.
- (ix) The Indian Constitution was enacted on _____.
- (x) The Writ of Mandamus is issued for _____.
- (xi) The age of retirement of a judge of the Supreme Court of India is _____.
- (xii) There are _____ States in Indian Union.
- (xiii) The Chairman of the Planning Commission of India is _____.

