JHARKHAND RAKSHA SHAKTI UNIVERSITY

SUBJECT: Programming Using C (BCACS-101) F.M.: 50

SEMESTER:BCACS-I TIME:2 hrs P.M.: 23

SECTION A

Q.I is compulsory. 1 x 10=10

1. Which of the following function is user defined?
   A) Printf **C) scanf**
   B) While **D) None**
2. Which of the following is the correct way of declaring an array?
   A) int ABC[10]; **C) int ABC;**
   B) ABC{20}; **D) array ABC[10];**

3. What will be the output of the following code?

```
#include <stdio.h>
int main()
{
  int a[5]={19,12,13,23,90};
  printf("%d", a[5]);
    return 0;
}
```

   A) Garbage value **C) 10**
   B) 50 **D) None of the above**

4. When will a while loop get terminated
   A) When given condition is true. **C) When given condition is false.**
   B) Depends upon other factors. **D) After first iteration.**

5. The term 'push' and 'pop' is related to the
   A) Array **C) Linked list**
   B) Queue **D) Stack**

6. Which of the following statement will print the output in two different lines?
   A) printf("JRSU RANCHI"); **C) Printf("\n JRSU RANCHI);**
   B) printf("JRSU RANCHI \n"); **D) printf("JRSU \n RANCHI");**

7. Insertion of an element at the middle of a linked list requires the modification of how many pointers?
   A) 2 **C) 1**
   B) 3 **D) 4**

8. Which type of traversal of binary search tree outputs the value in sorted order
   Which type of traversal of binary search tree outputs the value in sorted order?
   A) Pre-order **C)In-order**
   B) Post-order **D) None**

9. The best data structure to check whether an arithmetic expression has balanced parentheses is a
   A) Queue **C) Stack**
   B) Tree **D) List**

10. What is a full binary tree?
    A) Each node has exactly zero or two children **C) Each node has exactly two children**
    B) All the leaves are at the same level **D)Each node has exactly one or two children**

II. Short Answer Questions. Attempt any **FOUR** 4x5=20 MARKS

1. Define function? Write a program in C to check whether a number is a prime number or not using the function.

2. What is an array? Write a program in C to create an array of 10 elements.
3. Write a program to insert and delete an element from stack.
4. Differentiate between while loop and do while loop. Write a C program to find input number is prime or composite.
5. What is the difference between queue and circular queue?
6. Discuss linked list with its types.
7. Write Short Note on
   a. Structure b. Pointer

III. Long Answer Questions. Attempt any **TWO** 10x02=20 MARKS

1. Write an algorithm to insert a node at the beginning of a linked list.
2. What is operator? Discuss various types of operators available in C language. Give an example of each.
3. Define queue data structure and explain its types.
4. Write a program in C to illustrate binary search

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SUBJECT: Mathematics (BCACS-GE-1) F.M.: 70

SEMESTER:BCACS-I TIME:$2\frac{1}{2}$ Hours P.M.: 32

I. Multiple Choice Questions (1× 15 = 15)

1.If $u = e^{xyz}$, the value of $\frac{\partial^3 u}{\partial x \partial y \partial z}$ is

(i) $e^{xyz}\left(x^2y^2z^2 + 3xyz + 1\right)$ (ii) $e^{xyz}\left(x^2yz^2 + 3xyz + 1\right)$ (iii) $e^{xyz}\left(x^2y^2z + 3xyz + 1\right)$ (iv) $e^{xyz}\left(xyz\right)$

2. The value of $\int_0^{\pi} \sin x\, dx$

(i) 0 (ii) 2 (iii) 1 (iv) None of these

3. The value of $\int_3^7 \left(\sin t - 2\cos t\right) dt$

(i) -cos7 -2sin7 + cos3 +2sin3 (ii) cos7 -2sin7 - cos3 +2sin3 (iii) cos7 -2sin7 + cos3 +2sin3 (iv) None of these

4. If $y = 2^x$, then $\frac{dy}{dx}$ is

(i) $\frac{2^x}{\log 2}$ (ii) $2^x \log 2$ (iii) $x2^x$ (iv) None of these

5. If $y = \log\left(x + \sqrt{x^2 + a^2}\right)$, then $\frac{dy}{dx}$ is

(i) $-\frac{1}{\sqrt{x^2 + a^2}}$ (ii) $\frac{1}{\sqrt{x^2 + a^2}}$ (iii) $\frac{1}{2\left(x + \sqrt{x^2 + a^2}\right)}$ (iv) None of above

6. If $-y = \sqrt{\frac{\sec x - 1}{\sec x + 1}}$, then $\frac{dy}{dx}$ is

(i) $\sec^2 x$ (ii) $\frac{1}{2}\sec^2\frac{x}{2}$ (iii) $-\frac{1}{2}\operatorname{cosec}^2\frac{x}{2}$ (iv) None of these

7. If $u = x^2\hat{i} + xyz\hat{j} - z\hat{k}$, then value of $\nabla \times u$ at thepoint (2, 1, -2)

(i) $2\hat{i} + 2\hat{k}$ (ii) $-2\hat{i} - 2\hat{j}$ (iii) $4\hat{i} - 4\hat{j} + 2\hat{k}$ (iv) $-2\hat{i} - 2\hat{k}$

8. The maximum value of the directional derivative of the function $\varphi = 2x^2 + 3y^2 + 5z^2$ at a point (1,1, -1) is

(i) 10 (ii) -4 (iii) 152 (iv) $\sqrt{152}$

9. The gradient of scalar filed $u(x, y) = y^2 - 4xy$ at (1,2) is

(i) $8\hat{i}$ (ii) $-8\hat{i}$ (iii) $4\hat{i}$ (iv) 0

10. The value of b^2 in order that the foci of the hyperbola $\frac{x^2}{144} - \frac{y^2}{81} = \frac{1}{25}$ and the ellipse $\frac{x^2}{16} - \frac{y^2}{b^2} = 1$ coincide is

(i) 1 (ii) 5 (iii) 7 (iv) 9

11. What is the focus of the parabola $x^2 = 16y$?

(i) (4,0) (ii) (0,4) (iii) (0, -4) (iv) (4,4)

12. For the parabolas $x^2 = 4ay$ and $y^2 = 4ax$

(i) Vertex are same (ii) Foci are same (iii) Directrix are same (iv) None of these

13. The set of all limit points of the set $S = \left\{\frac{1}{n} : n \in N\right\}$ is

(i) φ (ii) $\{0\}$ (iii) N (iv) None of these

14. The set of real numbers in the closed interval {0, 1} is

(i) Countable Set (ii) Uncountable Set (iii) Finite Set (iv) None of these

15. The value of $\lim_{n\to\infty}\left[\frac{1}{\sqrt{n^2+1}} + \frac{1}{\sqrt{n^2+2}} + \ldots\ldots + \frac{1}{\sqrt{n^2+n}}\right]$ is

(i) 1 (ii) 0 (iii) 2 (iv) None of above

IIShort Answer Type Questions; -- (5×5= 25)

1. If $y = e^{a\sin^{-1}x}$, prove that $\left(1-x^2\right)y_{n+2} - (2n+1)xy_{n+1} - \left(n^2+a^2\right)y_n = 0$
2. Evaluate $\int_0^1 \frac{\log(1+x)}{1+x^2}dx$
3. Using Maclaurin's series, expand $\tan x$ upto the term containing x^5
4. Find div F and curl F, where $F = grad\left(x^3+y^3+z^3-3xyz\right)$
5. Define monotonic sequence. Prove that every bounded, monotonic sequence converges to a real number.
6. What is the condition for the line $lx+my-n=0$ to be the tangent to the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$
7. An ellipse has its major axis along y-axis and minor axis along x-axis. If its length of latus rectum is $\frac{2}{3}$ times of its minor axis, then find the eccentricity of the ellipse.
8. Evaluate $\int \frac{1}{\sqrt{16-25x^2}}dx$

III. Long Answer Type Question (15× 2 = 30)

1. Expand $\log_e x$ in power of $(x-1)$ and hence evaluate $\log_e 1.1$ correct to 4 decimal places.
2. Evaluate $\nabla\times(\nabla\times F)$, where F is vector point function.
3. Let $\{a_n\}$ be a bounded sequence of real numbers. The prove that $\{a_n\}$ has a convergent subsequence.
4. Find the coordinates of the foci, the vertice, the length of the minor and major axis, the length of the latus rectum, and the eccentricity of the ellipse $\frac{x^2}{16}+\frac{y^2}{9}=1$

JHARKHAND RAKSHA SHAKTI UNIVERSITY

SUBJECT: English Communication Skills (BCACS-AECC-101) **F.M.: 70**

SEMESTER: BCACS-I **TIME: $2\frac{1}{2}$ Hours** **P.M.: 32**

Answer from all units as directed.

Unit. 1

Choose the most appropriate option in the following multiple choice questions. All the questions are compulsory.

1×15=15 marks

1. Oculesics refers to:
a) Use of time b) Eye contact c) Use of touch d) All of the above

2. "Communication is the intercourse by word, letters or messages, intercourse of thoughts or opinions. It is the act of making one's ideas and opinions known to others."
This definition is given by:
a) Keith Davis b) American Management Association
c) Fred G. Meyer d) D.E. McFarland

3. Select the Barriers to interpersonal communication:
A) Physical Disabilities B) Using Jargon C) Language Difference D) Prejudices
a) A and B only b) A, D, B c) A, B, C only d) All of the above

4.Identify the skills promoted by communication from the following:
A) Reading and listening B) Listening and helping
C) Helping and speaking D) Speaking and writing
Choose the correct option:
a) A and B only b) B and C only c) A and D only d) C and D only

5. Multimedia comprises of
a) text and audio. b) video and audio.
c) video only. d) text, audio and video.

6. Which of the following is not the element of communication process?
a) Feedback b) Reinforcement c) Medium d) Interaction

7. _____ is a system of arbitrary signals, such as voice sounds, gestures, or written symbols.
a) Interpretation b) Language c) Message d) Media

8. The main purpose of _____ is to provide feedback on several areas of organizational functioning.
a) horizontal communication b) diagonal communication
c) upward communication d) downward communication

9. _____ is the fastest type of reading used when we wish to find some specific information about something quickly by glancing through the text.
a) Skimming b) Scanning c) Extensive reading d) Detailed reading

10. _____ is the most common style of resume adopted by applicants where the focus is on education and work experience.
a) Functional resume b) Chronological resume c) Combination resume d) None of the above

11. Communication is a part of _____ skills.
a) hard b) soft c) rough d) short

12. There are some fundamental differences between verbal and non-verbal communication. Find out the option(s) that represent(s) the feature(s) of Non-verbal communication.
a) Perfectly syntactical b) Spontaneous c) Highly organized d) Both b & c

13. A major barrier in the transmission of cognitive data in the process of communication is an individual's
a) Personality b) Expectation c) Social Status d) Coding Ability

14. Communication via New media such as computers, teleshopping, internet and mobile telephony is termed as
a) Entertainment b) Interactive Communication
c) Development Communication d) Communitarian

15. In the classroom, the teacher sends the message either as words or images. The students are really
a) Encoders b) Decoders c) Agitators d) Propagators

Unit 2.
Answer any 5 questions.
5×5= 25 marks

1. "In its everyday meaning, communication refers to the transmitting of information in the form of words, or signals or signs from a source to a receiver". Elaborate.
2. What are the different stages that one needs to cross in order to communicate effectively?
3. What are the features of Non-verbal communication?
4. What are the etiquettes needed for Business Communication?
5. Communication is complete only when it is understood and acted upon. Explain.
6. What is an interview? Briefly explain the differences between an interviewer and an interviewee.
7. What are the characteristics of effective business communication.
8. ' Your audience receives the message exactly as you intend it to be.' Do you agree or disagree with this statement? Justify your answer and alsc provide examples.

Unit 3.
Answer any two questions.
15×2 = 30 marks

1. Write a note on any three of the following : (100 words each)
a) Chronemics b) Kinesics c) Haptics d) Vocalist e)Proxemics
2. Expand the idea :- " A stitch in time saves nine".
3. You wish to apply for the job of a computer analyst. Draft your resume and a cover letter to apply for the post.
4. Write a letter to the Chairman, Jharkhand State Municipal Corporation complaining about the pot holes and inconveniences caused.

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SUBJECT: Computer System Architecture (BCACS-102) F.M.: 50

SEMESTER: BCACS-I TIME: 2 hrs P.M.: 23

Q1. **Multiple Choice Questions** **10 x 1= 10**

I. Minterms for the function Y(A,B,C) =A+ BC are

a. $Y(A,B,C) = \sum m(0,1,2,7,5)$
b. $Y(A,B,C) = \sum m(0,1,2,7,4,5)$
c. $Y(A,B,C) = \sum m(5,6,7,4,3)$
d. None of above

II. The 2's complement of 1111 is _____

a. 1010
b. 0000
c. 0001
d. None of above

III. Which is not a type of flip flop

a. J flipflop
b. JK flipflop
c. T flipflop
d. All of above

IV. 7 th complement of 134_8 is

a. 644_8
b. 643_8
c. 345_8
d. None of above

V. The excess-3 code for 584 is given by ------

a. 100010110111
b. 100010110111
c. 100010010110
d. 100001010110

VI. Logic micro-operation performs bit-manipulation operations on data stored in

a. Registers
b. RAM
c. ALU
d. None of above

VII. Determine the output of adder-subtractor circuit if M = 1, A = 0101, B = 1010

a. 01101
b. 11101
c. 01001
d. 01011

VIII. The addressing mode/s, which uses the PC instead of a general-purpose register is

a. Indexed with offset
b. Relative
c. Direct
d. Both Indexed with offset and direct

IX. The hardware register that contains the status information characterizing the state of the CPU is

a. PC
b. PSW

c. Status register
d. Accumulator

X. In Computers with virtual memory

a. Address space is larger than Memory space.
b. Memory space is larger than Address space.
c. Address space and Memory space are equal.
d. None of the above.

Short answer questions. Answer any four. **4 x 5 = 20**

Q2. Explain in brief about the digital computer with a diagram.

Q3. Solve the function together with don't care condition in Sum of product form :

,

Q4. Perform the subtraction using 10's complement of the subtrahend:
(i) 72532 - 3250. (ii) 3250 -72532

Q5. What is register transfer language? Draw the block diagram of the hardware that implements the following register transfer statement:

yT_2: $R2 \leftarrow R1, R1 \leftarrow R2$

Q6. Design and explain a Full Adder combinational circuit with two half adders and an OR gate.

Q7. Explain the different five types of Addressing Modes.

Q8. What is meant by Multiplexer? Explain a 4 to 1-line Multiplexer with a diagram and truth table.

Long answer questions. Answer any two. **2 x 10 = 20**

Q9. Design a combinational circuit with three inputs x, y, z and three outputs A, B, C. When the binary input is 0, 1, 2, or 3, the binary output is one greater than the input. When the binary input is 4, 5, 6, or 7, the binary output is one less than the input.

Q10. Explain and design a 4-bit adder cum subtractor.

Q11. Write a program to evaluate the arithmetic statement:

$$\frac{A * [B + C * (D + E)]}{F * (G + H)}$$

a. Using a general register computer with three address instructions.

b. Using a general register computer with two address instructions.

Q12. Write short notes on the following: (i) Memory Hierarchy (ii) CacheMemory.

JHARKHAND RAKSHA SHAKTI UNIVERSITY

SUBJECT: EVS AECC-102 F.M. : 70

SEMESTER: BCACS-.I TIME: 2 1/2hrs P.M. : 32

SECTION A

Q.I is compulsory. 1 x 15=15

Multiple choice questions:

1) The final stable community in ecological succession is:
i) Climax ii) Pioneer iii)Sere iv) Carnivores

2) World environment day is observed on:
i) 5th June ii)10 August iii)16 September iv) 2 January

3) Tiger reserve in Jharkhand is:
i) Palamu ii) Lohardaga iii) Ranchi iv) Dhanbad

4) Which of the following is not a greenhouse gas?
i) Carbon monoxide ii) Methane iii)Nitrous oxide iv) carbon dioxide

5) The importance of ecosystem lies in:
i)Flow of energy ii) Cycling of minerals iii)Both iv) None of above

6) The pyramid of energy is:
i) Upright ii) inverted iii) Both iv) None of above

7) How many biogeographic zones does India have?
i)5 ii) 10 iii)28 iv) 32

8) Cutting of trees on large scale is called:
i) Afforestation ii) Reforestation iii) Deforestation iv) None of the above

9) Minamata disease is caused by:
i)Lead ii) Mercury iii)Cadmium iv) Arsenic

10) Sunderban is world heritage site for
i)Tiger reserve ii)sundries tree iii)mangrove forest iv) Biodiversity

11) An extensive number of chains interlinked in an Ecosystem forms a ..... together.
i) Food chain ii) Food web iii) Carbon cycle iv)Nitrogen

12) The term "Ecosystem" was given by:
i) Warning ii)Odum iii)Tansley iv)Hackel

13) Pollutant responsible for ozone hole
i)CO2 ii)SO2 iii)CO iv)CFC

14)Which layer of atmosphere contains ozone responsible for the absorption of UV
i) Stratosphere ii) Troposphere iii) Mesosphere iv)None

15) Hydrarch succession takes place in:
i) Dry area ii)Bare area iii)Wet area iv)None of these

II. Short Answer Questions. Attempt any **FIVE** 5 *5=25 MARKS

1. What do you mean by renewable and non renewable energy resources?
2. Explain global warming.
3. Discuss about women and child welfare.
4. Briefly discuss about population explosion.
5. What do you mean by natural resources? Also discuss about its types and their characteristic features.
6. Briefly discuss about solid waste management.
7. Discuss about Deforestation.
8. Briefly discuss about role of an individual in prevention of pollution.

III. Long Answer Questions. Attempt any **TWO** 15 *2=30 MARKS

1. Briefly discuss about ecosystem, its structure and function.
2. Write short notes on biogeographical classification of India.
3. Discuss about different types of environmental pollution.
4. Explain water resources. Discuss benefits and problems associated with dams.