



RAJARSHI JANAK UNIVERSITY
OFFICE OF THE CENTRAL EXAMINATION
End Semester Examination 2024

MODEL QUESTION

Faculty: BSc CSIT

Course Title: Computer Concept and Programming

Course Code: CSIT 104

Year/Semester: I/I

Full Marks: 60

Pass Marks: 24

Time: 3 Hours

Candidate are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks.

[Group A]

Very Short Questions.

[5X2=10]

1. What is input device and output device?
2. What is use of Bit wise operator?
3. break and continue statement
4. What is Storage classes in C?
5. Uses of String handling functions

[Group B]

Short questions (any six):

[6X5=30]

6. Define algorithm and flowchart. Write algorithm and flowchart to verify and display the greatest number among three numbers given.
7. What is formatted input/output function in C-programming? Write the syntax of each function.
8. Define loop and its types. Write a program to display sum of digits of a multi-digit number given by user using function.
9. Define function and its advantages. Write a function which accepts two integers as argument and return sum of them.
10. Define pointer. Write a program to display the smallest of all the elements of an array using pointer.
11. Write a program to read and print data of file.
12. Define graphics function. Write a program to draw a rectangle.

[Group C]

Long questions (any two):

[10X2=20]

13. Define structure of C program with suitable example.
14. Explain array and types. Write a program to check if two matrices are identical or not.
15. WAP to read Id, name and price of 10 books using array of structure. Display information of each book in ascending order based on Id of book.



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MODEL QUESTION

Faculty: BSc CSIT

Course Title: Technical Communication in English

Course Code: CSEN 103

Year/Semester: I/I

Full Marks: 60

Pass Marks: 24

Time: 3 Hours

Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks.

Group A

Write very short answers to any five of the following questions:

[5x2 = 10]

1. What is communication in an organization?
2. What do you understand by the term 'interpersonal barriers'?
3. Write your understanding on 'Proof-reading'.
4. Define 'Memo' and write its uses in the organizational communication.
5. Write the silent features of group presentation.
6. How are Graphics useful in written communication?

Group B

Write short answers to any six of the following questions: (Q.N. 13 is compulsory)

[6x5 = 30]

7. Differentiate between Technical Communication and General Communication.
8. How is feedback important in communication? Give two examples of delayed feedback.
9. Define and differentiate between footnotes and bibliographic procedures in technical writing.
10. What is extempore speaking, and how can it improve oral communication skills?
11. Differentiate between the CV and the Resume writing.
12. Write an email to the mayor of your municipality requesting him/her about IT education at the local level.
13. Supply the correct word form or do as indicated in the brackets:
 - a. Mohan is one-legged peon in our office. (a/an/the/no articles)
 - b. What do you keep in your pocket? (into Passive Voice)
 - c. This is Steve. Do you know ? (correct form of pronoun)
 - d. If you made this happen, you lamentation. (a correct form of the verb 'not do')
 - e. The house stands(in/at/among/across) trees.

Group C

Comprehensive and Long Question. Solve any two questions. (Question No. 14 is compulsory.) [2x10=20]

14. Read the following text carefully and answer the questions that follow.

In December 1997, negotiators from more than 150 countries gathered in Kyoto Japan, to decide whether to impose mandatory measures to address the most difficult environmental problem of our time; humanity's experiment on the world's climate. An agreement was adopted to require industrialized countries to make significant reductions in their emissions of warming gases over the next 10 to 15 years to achieve this, nations will have to reduce their use of fossil

fuels, such as coal and oil, and begin a steady transition toward a new energy system, based on efficiency and renewable energy.

The Science Driving the politics. The earth's atmosphere is transparent, allowing sunlight to enter and warm its surface. Some of the gases in the atmosphere, including water vapor, carbon diode, methane, and nitrous oxide, are called the greenhouse effect, much of the sun's warmth would be lost to space, and the surface of the world would be about 61 degrees Fahrenheit colder, too frigid for most forms of the lie.

Since, industrialization, however, the levels of these gases in the atmosphere have risen substantially, due to the increased combustion of fossil fuels (coals, oil, and natural gas) used to produce electricity, power cars, run factories, and heat and cool houses. Greenhouse gases have also been emitted as a result of deforestation and certain agricultural practices. The accumulation of these gases is changing the earth's climate by trapping more of the sun's energy. The globally averaged temperature of the air at the earth's surface has warmed between 0.5- and 1-degree Fahrenheit since the late ninetieth century. The sea level has also risen about four to 10 inches since the late nineteenth century due primarily to the melting of glaciers and the thermal expansion of the oceans, phenomena attributed to global warming.

In 1998 in recognition of the gravity of this problem, the nations of the world appointed the Intergovernmental panel on climate change (IPCC) consisting of more than 2000 leading experts from around the world, to assess the science and economics of climate change. In a landmark 1995 report, the IPCC concluded that "the balance of evidence suggests a discernible human influence on global climate."

Questions:

- a) What was the purpose of the negotiator's gathering in Kyoto Japan?
- b) What are greenhouse gases?
- c) Why are greenhouse gases considered dangerous?
- d) Why was the IPCC set up?
- e) What is the theme of this passage? Mention within the one-line answer.

- 15. Draft a professional resume and cover letter tailored to the position of IT Manager at WordLink, specifically for the Janakpur branch.
- 16. You are the production engineer in a washing machine manufacturing company. The General Manager has received a new design for a washing machine and a prototype washing machine from an engineering company. You are asked to test the machine and give a detailed report about its cost, size, strength, safety, and efficiency. Prepare the report.



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MODEL QUESTION

Faculty: BSc CSIT

Course Title: Digital Logic

Course Code: SCIT 105

Year/Semester: I/I

Full Marks: 60

Pass Marks: 24

Time: 3 Hours

Candidate are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks.

Answer the following questions:

(5X2=10)

1. Define Mealy and Moore State Machine.
2. What is odd parity?
3. What are basic gates, Universal gates and Arithmetic Gates?
4. Define SOP and POS.
5. Define Flip-flop.

Answer the following questions: (ANY SIX)

(5X6=30)

6. Differentiate between Analog Systems and Digital Systems.
7. Perform the arithmetic operation $(+42)+(-30)$ using 1's and 2's complement and 9's and 10's Complement.
8. Design a full adder using only NOR gates.
9. Solve the following:
 $F(A,B,C,D)=\sum m(0,5,8,14,15) + \sum d(7,10,11)$
Reduce it using K-map and design the circuit.
10. What is De-multiplexer? Explain the working principle of 1 X 4 De-multiplexer.
11. Define comparator. Differentiate between Programmable Array Logic and Programmable Logic Array.
12. Design the Arithmetic Logic Unit.

Answer the following questions: (ANY TWO)

(10X2=20)

Question No: 13 is Compulsory

13. A 4-bit data transmission system uses a parity bit generator to ensure error detection. The system supports both even and odd parity methods.

Scenario:

A sender wants to transmit a 4-bit data stream $A_3 A_2 A_1 A_0$ with an additional parity bit (P) to ensure error detection. The receiver uses a parity checker to verify whether the received data contains errors.

Question:

Based on the given Scenario, Construct a truth table for a 4-bit even parity generator and derive its Boolean expression with the suitable diagram.

14. Design and explain BCD adder circuit with suitable examples.
15. Draw a logic diagram, graphical symbol, characteristics table, characteristics equation and excitation table of SR flip flop.



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MODEL QUESTION

Faculty: BSc CSIT

Course Title: Mathematics-I

Course Code: CSMT 101

Year/Semester: I/I

Full Marks: 60

Pass Marks: 24

Time: 3 Hours

Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks

[Group A]

Very short answer questions:

[5x2 = 10]

1. Find the domain and range of the function $f(x) = \sqrt{x-3}$.
2. Evaluate: $\lim_{x \rightarrow 0} \frac{\sin x}{x}$.
3. Find the derivative of $f(x) = e^{2x} \sin x$.
4. Find the particular solution of the differential equation $\frac{dy}{dx} = x^2 + y^2$, given that $y = 1$ when $x = 0$.
5. State the Euler's theorem on homogeneous functions.

[Group B]

Short answer questions (Attempt any six):

[6x5 = 30]

6. Verify Lagrange's mean value theorem for $f(x) = x^2 - 4x$ in $[0, 4]$.
7. Determine the asymptotes of the curve $y = \frac{3x}{x^2 - 1}$.
8. Solve the differential equation: $\frac{dy}{dx} + y = e^x$.
9. Find the volume of the solid obtained by revolving $y = x^2$ about the x-axis.
10. Verify Euler's theorem for homogeneous functions for $f(x, y) = x^2 + 2x^2y$ and show that it satisfies the theorem.
11. Find the area enclosed between the curves $y = x^2$ and $y = 2x$.
12. Find the angle between the vectors: $\vec{a} = (3\hat{i} - 2\hat{j} + \hat{k})$ and $\vec{b} = (\hat{i} - 2\hat{j} - 3\hat{k})$.

[Group C]

Long answer questions (Attempt any two):

[2x10 = 20]

13. (A) Find the Taylor series expansion of $f(x) = e^x$ up to the fourth term about $x = 0$.
(B) Verify if the function $f(x) = |x|$ is continuous and differentiable at $x = 0$.
14. (A) Solve the differential equation $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 4y = 0$.
(B) Use cylindrical shells to find the volume of the solid generated by revolving $y = \sqrt{x}$ around the y-axis.
15. (A) Evaluate $\iint_R (x^2 + y^2) dx dy$ where R is the region bounded by $x = 0, y = 0, x + y = 1$.
(B) Prove that the dot product of two vectors is distributive over addition.



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MODEL QUESTION

Faculty: BSc CSIT

Course Title: Physics

Course Code: CSPH 102

Year/Semester: I/I

Full Marks: 60

Pass Marks: 24

Time: 3 Hours

Candidate are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks.

Answer the following questions:

(5X2=10)

1. What is conservative force? Prove that a central force like gravitational force is a conservative force.
2. Write the expression for displacement of a simple harmonic oscillator and prove that the velocity of simple harmonic oscillator leads the displacement by phase angle $\pi/2$.
3. What is torque? Describe the conditions of minimum and maximum torque.
4. Define forward biasing and state the effect of forward biasing on the depletion layer at the junction of p-type and N-type semiconductors.
5. Find the de-Broglie wavelength of an electron of charge 'e' accelerated by a potential difference of 'V'?

Answer the following questions: (ANY SIX)

(5X6=30)

6. What is torsional pendulum? Show that oscillations of a torsional pendulum of SHM and find its time period.
7. What is electric dipole? Derive an expression for the electric field intensity due to a small electric dipole at a point on its equatorial line.
8. State Biot –Savart law and use it to find the electric field due to a straight conductor carrying current in it.
9. What is cyclotron? An electron emitted with zero velocity from the hot cathode in a vacuum tube is accelerated by the electric field towards the anode. If the anode is at positive potential of 400 V with respect to the cathode, find the velocity acquired by the electron as it reaches the anode. ($e=1.6 \times 10^{-19}$, $m=9.11 \times 10^{-31}$ kg)
10. State Heisenberg's uncertainty principle and use it to prove the non-existence of the electron in the nucleus of an atom.
11. Draw a circuit diagram for NPN common emitter transistor and explain the characteristics of the common emitter transistor.

Answer the following questions: (ANY TWO)

(10X2=20)

12. a. What is Hall Effect? Derive an expression for the Hall coefficient and establish a relation between the mobility of the charge carrier and the conductivity of the metallic conductor.
b. Two point charges each of 3×10^{-7} C are placed in the two corners of an equilateral triangle whose side is 1 m. What is the electric field corner of the triangle due to these charges?
13. a. Write Maxwell's equations in Integral form and convert them in differential form.
b. State Gauss's theorem in electrostatics and use it to find electric field intensity due to spherically symmetric charge distribution
14. a. Two long parallel wires 8 cm apart carry equal currents I opposite directions. If the magnetic field half-way between them is to have a magnitude of $300 \mu\text{T}$, find the value of current in each wire. ($\mu_0=4\pi \times 10^{-7} \text{ Hm}^{-1}$)
b. An observer is at a distance of 1m from the point source of light whose power output is 1KW. Calculate the magnitude of electric field (E_m) and Magnetic field (B_m).