 [PPU-D-II-(H)-BCA-3]

Degree (Part-II) Examination, 2024

(Vocational)

COMPUTER APPLICATION

[Paper : Third]

Paper Code : 400803

Time : Three Hours] **[Maximum Marks : 75**

Note : Candidates are required to give their answers in their own words as far as practicable. The questions are of **equal** value. Answer **any five** questions.

1. (a) Discuss types of decision making statements with example.

   (b) What is Explicit type Conversion? Discuss with suitable example.

2. (a) What is Union? Discuss advantages of Union.

   (b) Write a program to take EmpCode, name and salary of employee and display using union.

3. (a) Write the difference between decision making statement and loop.

(b) Discuss types of Pointer with suitable example.

4. (a) What is Computer Network? Write advantages of Computer Network.

(b) Discuss twisted wire and its role in Computer Network.

5. (a) Write the rules of Boolean Algebra.

(b) What is Half Adder? Discuss Half Adder with diagram.

6. (a) Define malloc(), Calloc() and free() with example.

(b) Write a program to take a number and print sum of factors of a number.

7. (a) Write difference between dial-up and leased line connection.

(b) What is Constant? Discuss the symbolic constant with suitable example.

8. (a) What is Operator ? Discuss Binary operator with suitable example.

(b) What is type casting ? Discuss the types of type casting.

9. (a) State and prove the DeMorgan's theorem in Boolean Algebra.

(b) What is K-Map ? Discuss K-Map for 2-variable using suitable example.

10. Write short notes on **any four** of the following :

(a) getchar()

(b) puts()

(c) printf()

(d) scanf()

(e) Call by reference function

(f) fscanf()

THE END

Total Pages : 4 [PPU-D-II-(H)-BCA-4]

Degree (Part-II) Examination, 2024

(Vocational)

COMPUTER APPLICATION

[Paper : Fourth]

Paper Code : 400804

Time : Three Hours] **[Maximum Marks : 75**

Note : Candidates are required to give their answers in their own words as far as practicable. The questions are of equal value. Attempt any five questions.

---

1. (a) Define linear queue. How circular queue is better than linear queue?

   (b) Write a function to delete a number in circular queue.

2. (a) Write a function to insert a number into a Binary search tree.

(b) Define the Expression tree. Create the expression tree of the following expressions :

(i) $(a-b)+(c\times d)$

(i) $a+b/c\times d-e$

3. (a) Define the depth first search algorithm

(b) Discuss the representation of Graph.

4. Write short notes on **any three** of the following :

(a) Minimum spanning tree

(b) Bubble sort

(c) Binary search

(d) Selection sort

5. (a) Define the AVL tree and also discuss the advantages of it.

(b) Define the Threaded Binary tree.

6. (a) Write an algorithm to convert an infix expression into postfix expression.

(b) Write a program to implement a stack using an array.

7. (a) Define Time and Space Complexities analysis of an Algorithm.

(b) Define Data Structure and Operations perform on it.

8. (a) What is algorithm ? Discuss the role of algorithm in data structure.

(b) What is ADT ? Discuss some ADT with suitable example.

9. (a) Write a function to insert a number in circular queue.

(b) What is circular queue? Discuss its Advantages over simple queue.

10. (a) Write the steps to design a building layout and interior design.

(b) What is AUTOCAD ? Write the features of AUTOCAD.

THE END

Degree (Part-II) Examination, 2024

(Subsidiary/Vocational/General)

MATHEMATICS

Paper Code :
- **For Sub. : 120402**
- **For Voc. : 140402**
- **For Gen. : 100402**

Time : Three Hours] [Maximum Marks : 100

Note : Candidates are required to give their answers in their own words as far as practicable. The questions are of **equal** value. Answer **five** questions in **all**. **Question no. 1** is **compulsory**. Besides this, attempt at least **one** question from each Group.

परीक्षार्थी यथासम्भव अपने शब्दों में ही उत्तर दें। सभी प्रश्नों के मान **समान** हैं। कुल **पाँच** प्रश्नों को हल कीजिए। **प्रश्न सं. 1 अनिवार्य** है। इसके अतिरिक्त प्रत्येक समूह से कम-से-कम एक प्रश्न को हल कीजिए।

1. Choose the correct option of the following: [10x2=20]

निम्नलिखित के सही विकल्प का चयन कीजिए :

(i) If $x\frac{dy}{dx}+3y=x$, then solution is :

(a) $x^3y=\frac{x^4}{4}+c$

(b) $x^2y^2=c$

(c) $xy+y^2+c=0$

(d) None of the above

यदि $x\frac{dy}{dx}+3y=x$, तो इसका हल है :

(a) $x^3y=\frac{x^4}{4}+c$

(b) $x^2y^2=c$

(c) $xy+y^2+c=0$

(d) उपरोक्त में से कोई नहीं

(ii) If $\frac{dy}{dx}+y\log x=x^2$, then solution is :

(a) $y=\frac{x^3}{4}+c$

(b) $y = \frac{x^4}{4} + c$

(c) $y = x + c$

(d) None of the above

यदि $\frac{dy}{dx} + y \log x = x^2$, तब इसका हल है :

(a) $y = \frac{x^3}{4} + c$

(b) $y = \frac{x^4}{4} + c$

(c) $y = x + c$

(d) उपरोक्त में से कोई नहीं

(iii) The equation of line of action of the resultant of coplanar forces is :

(a) $Yx - Xy = 0$

(b) $Yx - Xy + G = 0$

(c) $Xx - Yy + G = 0$

(d) None of the above

समतलीय बलों के परिणामी की क्रिया-रेखा का समीकरण है :

(a) $Yx - Xy = 0$

(b) $Yx - Xy + G = 0$

(c) $Xx - Yy + G = 0$

(d) उपरोक्त में से कोई नहीं

(iv) Change of velocity with respect to time is called :

(a) Force

(b) Displacement

(c) Acceleration

(d) None of the above

समय के सापेक्ष वेग में परिवर्तन कहलाता है :

(a) बल

(b) विस्थापन

(c) त्वरण

(d) उपरोक्त में से कोई नहीं

(v) The differential equation of S.H.M. is :

(a) $\frac{d^2x}{dt^2} = -\mu x$

(b) $\frac{dx}{dt} = -\mu x$

(c) $\frac{d^2x}{dt^2} = \mu x$

(d) None of these

सरल आवर्त गति का अवकल समीकरण है :

(a) $\frac{d^2x}{dt^2} = -\mu x$

(b) $\frac{dx}{dt} = -\mu x$

(c) $\frac{d^2x}{dt^2} = \mu x$

(d) इनमें से कोई नहीं

(vi) If $y = \sqrt{\sin x}$, then $\frac{dy}{dx}$ is :

(a) $\frac{1}{2}\sin x.\cos x$

(b) $\sqrt{\cos x}$

(c) $\sqrt{\sin x}.\cos x$

(d) None of these

यदि $y = \sqrt{\sin x}$, तब $\frac{dy}{dx}$ है :

(a) $\frac{1}{2}\sin x.\cos x$

(b) $\sqrt{\cos x}$

(c) $\sqrt{\sin x}.\cos x$

(d) इनमें से कोई नहीं

(vii) If $y = x\sin(a+y)$, then $\frac{dy}{dx}$ is

(a) $\frac{\sin^2(a+y)}{\sin a}$

(b) $\frac{\sin a}{\sin^2(a+y)}$

(c) $\frac{\sin(a+y)}{\cos a}$

(d) None of the above

यदि $y = x\sin(a+y)$, तब $\frac{dy}{dx}$ है :

(a) $\frac{\sin^2(a+y)}{\sin a}$

(b) $\frac{\sin a}{\sin^2(a+y)}$

(c) $\frac{\sin(a+y)}{\cos a}$

(d) उपरोक्त में से कोई नहीं

(viii) If $y = \sin(\log x)$, then $\frac{dy}{dx}$ is :

(a) $\frac{\log x}{\sin x}$

(b) $\frac{1}{x} \cdot \cos(\log x)$

(c) $\cos(\log x)$

(d) None of these

यदि $y = \sin(\log x)$, तब $\frac{dy}{dx}$ है :

(a) $\frac{\log x}{\sin x}$

(b) $\frac{1}{x} \cdot \cos(\log x)$

(c) $\cos(\log x)$

(d) इनमें से कोई नहीं

(ix) If $x^x = y^y$, then $\frac{dy}{dx}$ is :

(a) $-\frac{y}{x}$

(b) $-\frac{x}{y}$

(c) $\dfrac{1+\log x}{1+\log y}$

(d) None of the above

यदि $x^x = y^y$, तब $\dfrac{dy}{dx}$ है :

(a) $-\dfrac{y}{x}$

(b) $-\dfrac{x}{y}$

(c) $\dfrac{1+\log x}{1+\log y}$

(d) उपरोक्त में से कोई नहीं

(x) $\int \log x \, dx$ is equal to :

(a) $x \log x - x + c$

(b) $\dfrac{1}{x} + c$

(c) $x \log x + c$

(d) None of the above

$\int \log x \, dx$ के समान है :

(a) $x\log x - x + c$

(b) $\frac{1}{x} + c$

(c) $x\log x + c$

(d) उपरोक्त में से कोई नहीं

Group-A / (समूह–अ) [20 marks each]

2. (a) If $y = \sin(ax+b)$, then find y_n.

यदि $y = \sin(ax+b)$, तब y_n का मान प्राप्त कीजिए।

(b) State and prove Leibnitz theorem on successive differentiation.

लाइबनिज़ के उत्तरोत्तर अवकलन की प्रमेय का कथन दीजिए और सिद्ध कीजिए।

3. (a) Show that : $\int_0^1 \frac{\log(1+x)}{1+x^2} dx = \frac{\pi}{8}\log 2$

दिखाइए कि : $\int_0^1 \frac{\log(1+x)}{1+x^2} dx = \frac{\pi}{8}\log 2$

(b) Evaluate : $\int \frac{x\sin^{-1}x}{\sqrt{1-x^2}}dx$

मूल्यांकन कीजिए : $\int \frac{x\sin^{-1}x}{\sqrt{1-x^2}}dx$

4. (a) Solve : $\frac{dy}{dx} = \frac{y}{x} + \tan\frac{y}{x}$

हल कीजिए : $\frac{dy}{dx} = \frac{y}{x} + \tan\frac{y}{x}$

(b) Solve : $\frac{dy}{dx}(1+x^2)\cdot\tan^{-1}x + y = 0$

हल कीजिए : $\frac{dy}{dx}(1+x^2)\cdot\tan^{-1}x + y = 0$

5. (a) Solve : $(x+1)\cdot\frac{dy}{dx}+1 = 2e^{-y}$

हल कीजिए : $(x+1)\cdot\frac{dy}{dx}+1 = 2e^{-y}$

(b) Solve : $x\frac{dy}{dx}+3y = x$

हल कीजिए : $x\frac{dy}{dx}+3y = x$

Group-B/ (समूह-ब) [20 marks each]

6. If $\vec{a}, \vec{b}, \vec{c}$ are three non-coplanar vectors, then prove that $\vec{b} \times \vec{c}, \vec{c} \times \vec{a}, \vec{a} \times \vec{b}$ are also non-coplanar.

   यदि $\vec{a}, \vec{b}, \vec{c}$ कोई तीन गैर-समतलीय सदिश हैं, तब सिद्ध कीजिए कि $\vec{b} \times \vec{c}, \vec{c} \times \vec{a}, \vec{a} \times \vec{b}$ भी गैर-समतलीय होंगे।

7. (a) Prove that : $(\vec{a} \times \vec{b}) \times \vec{c} = (\vec{a} \cdot \vec{c})b - (\vec{b} \cdot \vec{c})\vec{a}$

   सिद्ध कीजिए : $(\vec{a} \times \vec{b}) \times \vec{c} = (\vec{a} \cdot \vec{c})b - (\vec{b} \cdot \vec{c})\vec{a}$

   (b) Write down the necessary and sufficient condition that the three non-parallel, non-zero vectors $\vec{a}, \vec{b}, \vec{c}$ be coplanar.

   $\vec{a}, \vec{b}, \vec{c}$ कोई तीन गैर-समानांतर, गैर-शून्य सदिश हैं। इनके समतलीय होने की आवश्यक एवं अनिवार्य शर्त लिखिए।

Group-C/ (समूह-स) [20 marks each]

8. (a) Find the radial acceleration of a particle P(r, θ) describing a smooth curve.

   किसी कण P(r, θ) जो एक निष्कोण वक्र को वर्णित करता है, का त्रिज्य त्वरण ज्ञात कीजिए।

(b) Find the radial velocity of a particle $P(r, \theta)$ describing a smooth curve.

किसी कण $P(r, \theta)$ जो एक निष्कोण वक्र को वर्णित करता है, का त्रिज्य वेग ज्ञात कीजिए।

9. (a) Obtain necessary and sufficient conditions for the equilibrium of a system of coplanar forces acting on a rigid body.

एक दृढ़पिण्ड पर कार्य करने वाले समतलीय बलों की प्रणाली के संतुलन के लिए आवश्यक एवं पर्याप्त शर्तें प्राप्त कीजिए।

(b) Find the equation of the line of action of the resultant of coplanar system of forces acting on a rigid body.

किसी दृढ़पिण्ड पर कार्य करने वाली समतलीय बल प्रणाली के परिणामी की क्रिया-रेखा का समीकरण प्राप्त कीजिए।

THE END

Degree (Part-II) Examination, 2024

(Subsidiary/Vocational/General)

ENGLISH

Paper Code :
- **For Sub. : 220702**
- **For Voc. : 240702**
- **For Gen. : 200702**

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

Note : Candidates are required to give their answers in their own words as far as practicable. The figure in the margin indicate full marks. Answer all questions as directed.

---

1. Attempt **any three** from the following : [17x3=51]

(a) What is the central theme in Katherine Mansfield's short story "The Doll's House"?

(b) Orwell's 'Animal Farm' is full of symbolism. Comment.

(c) What does Robert Lynd say in defense of forgetfulness?

(d) Explain the theme of 'Sacrificial Love' in "The Gift of the Magi".

(e) Write the plot of the short story "The Parrot in the Cage" by Mulk Raj Anand.

(f) What are the chief characteristics of A.G. Gardiner as an essayist?

2. Explain with reference to the context of **any three** of the following : [8x3=24]

(a) Crafty men condemn studies, simple men admire them, and wise men use them; for they teach not their own use; but that is a wisdom without them, and above them, won by observation.

(b) Beasts of England, Beasts of Ireland,

Beasts of every land and clime,

Hearken to my joyful tiding,

Of the golden future time.

(c) Modern man remembers even telephone numbers and names of actors and actresses and cricketers and footballers and murderers. Thus he can remember almost everything in his life.

(d) Life is made up of sobs, sniffles and smiles, with sniffles predominating.

(e) If he be an unbeliever, he will be too profound and large-minded to ridicule religion or to act against it; he is too wise to be a dogmatic or fanatic in his infidelity. He respects piety and devotion; he even supports institutions as venerable, beautiful or useful, to which he does not assent; he honours the ministers of religion, and it contents him to decline its mysteries without assailing or denouncing them.

(f) I have been performing tricks for you, Torvald. That's how I've survived. You wanted it like that. You and papa have done me a great wrong. It's because of you I've made nothing of my life.

3. Rewrite the following sentences as directed without changing the meaning : [1x10=10]

(a) Do you know that he is having a lot of money. (correct the sentence)

(b) Please help the poor girl. (Change into passive voice)

(c) Everyone will like it. (Change into negative)

(d) Hari as well as his father are coming. (Correct the sentence)

(e) He said that he was playing tennis. (Change into direct speech)

(f) He worked hard, for he wanted to succeed. (Change into simple sentence)

(g) She says, "His car is blue". (Change into indirect speech)

(h) There is nothing wrong with me. (Change into interrogative)

(i) You can have tea. You can have coffee. (Combine to form compound sentence)

(j) No other boy is as good as Hari. (Change into superlative degree)

4. Write an essay on **any one** of the following : [15x1=15]

(a) Corona and its Impact on Human Life

(b) Pollution

(c) Addiction of Social Media

THE END