

**B.Sc (HONS.) IN CSE FOURTH YEAR SEVENTH SEMESTER  
EXAMINATION, 2021**

**ARTIFICIAL INTELLIGENCE**  
*[According to the New Syllabus]*

**Subject Code : 540201**

**Examination Code-5617**

**Time—3 hours**

**Full marks—80**

*[N.B. The figures in the right margin indicate full marks. Answer any four questions.]*

- |  | Marks |
|--|-------|
| 1. (a) What is the definition of Artificial Intelligence?  | 3     |
| (b) What are some common benefits of Artificial Intelligence Technology?                           | 5     |
| (c) How machine learning is related to AI?   | 5     |
| (d) What are the different components of expert system? Describe them.                             | 7     |
| 2. (a) What is the intelligent agent in AI and where are they used?                                | 3     |
| (b) How many types of agents are there in AI?  | 6     |
| (c) Describe the rules of inference.   | 6     |
| (d) What is knowledge representation in AI?  | 5     |
| 3. (a) Define problem. Describe single state and multiple state problem with the help of an agent. | 1+5=6 |
| (b) Mention the criteria for the evaluation of search strategy. Explain.                           | 4     |
| (c) Give a PEAS description of the task environment for automated car driver.                      | 5     |
| (d) Differentiate breadth first search and depth first search.                                     | 5     |
| 4. (a) What is heuristic and admissible heuristic? Prove that A* search is optimal.                | 3+5=8 |
| (b) Discuss hill climbing search. Mention some drawbacks of hill climbing search.                  | 4+3=7 |
| (c) Write a short note on genetic algorithm.   | 5     |

*[Please turn over*

- |  | Marks   |
|--|---------|
| 5. (a) What is artificial neural network? Give an analogy between artificial neural network and biological neural network. | 2+4=6   |
| (b) What is McCulloch-Pitts neuron model? Discuss Rosenblatt's perceptron learning algorithm.                              | 3+5=8   |
| (c) What is linear separability? How do you solve XoR with multilayer perceptron?  | 1+5=6   |
| 6. Write short notes on following topics (any four):   | 5×4 =20 |
| (a) Reactive Agents  |         |
| (b) Bidirectional Search   |         |
| (c) Backpropagation  |         |
| (d) First Order Logic  |         |
| (e) Data Representation  |         |
| (f) Forward Chaining   |         |
| (g) Game Theory.   |         |



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B.Sc. (HONS.) IN CSE FOURTH YEAR SEVENTH SEMESTER  
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**COMPILER DESIGN AND CONSTRUCTION**

**Subject Code : 540203**

**Examination Code-5617**

*[According to the new Syllabus]*

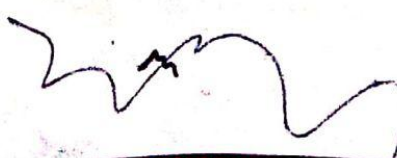
Time—3 hours

Full marks—80

*[N.B. The figures in the right margin indicate full marks. Answer any four questions.]*

- |  | Marks |
|--|-------|
| 1. (a) Define translator software. What are the differences between compiler and interpreter?  | 6     |
| (b) What are the phases of a compiler? Describe all the phases of compiler with example.   | 6     |
| (c) What do you mean by tokens? Explain different types of tokens.   | 4     |
| (d) Define preprocessor. What are the functions of preprocessor?   | 4     |
| 2. (a) How does a lexical analyzer interface between input stream and a parser?  | 5     |
| (b) Why is buffering used in lexical analysis? What are the commonly used buffering methods?   | 5     |
| (c) What is CFG? What are the components of CFG? Brief about them.   | 1+4=5 |
| (d) Consider the context free grammar:<br>$T \rightarrow TT^* \mid TT + \mid m$<br>Show how the string $mm \mid m^*$ can be generated by this grammar. | 5     |
| 3. (a) What do you mean by transition diagram? Draw the transition diagram of relational operators.  | 4     |
| (b) Write down the differences between NFA and DFA.  | 4     |
| (c) An NFA $N$ accepting the language $(a/b)^* abb$ , construct the DFA using the subset construction rule.  | 7     |
| (d) Write down the algorithm constructing a DFA from a regular expression $r$ .  | 5     |

*[Please turn over*



## Marks

4. (d) What are the four possible actions a shift-reduce parser? 6  
 Consider the grammar  $E \rightarrow E + E \mid E * E \mid (E) \mid id$   
 Show shift-reduce actions in stack for the input string  $id1+id2*id3$
- (b) What are the main problems of top-down parsing? Consider the 6  
 grammar—  
 $E \rightarrow E + T \mid T$   
 $T \rightarrow T * F \mid F$   
 $F \rightarrow (E) \mid id$   
 Eliminate the left-recursion from the above grammar.
- (c) Find FIRST and FOLLOW for the following grammar 6  
 $E \rightarrow TE'$   
 $E' \rightarrow + TE' \mid E$   
 $T \rightarrow FT'$   
 $T' \rightarrow * FT' \mid E$   
 $F \rightarrow (E) \mid id$
- (d) What is operator precedence parsing? 2
5. (h) Why it is necessary to optimize code? List out code 2+3=5  
 optimization rules.
- (b) Briefly describe loop optimization technique. 5
- (g) Translate the arithmetic expression into the following: 5  
 $a != b * -c + b * -c$   
 (f) Quadruples  
 (h) Triples
- (d) Describe code generation algorithm. 5
6. (a) What is dag? Write down the applications of dag. Write down the 8  
 algorithm for constructing a dag.
- (b) Describe peephole optimization briefly. 4
- (c) Illustrate loop optimization techniques. 4
- (d) Describe different types of errors. 4



B.Sc (HONS.) IN CSE FOURTH YEAR SEVENTH SEMESTER  
EXAMINATION, 2021

COMPUTER GRAPHICS

Subject Code : 540205

Examination Code-5617

[According to the New Syllabus]

Time—3 hours

Full marks—80

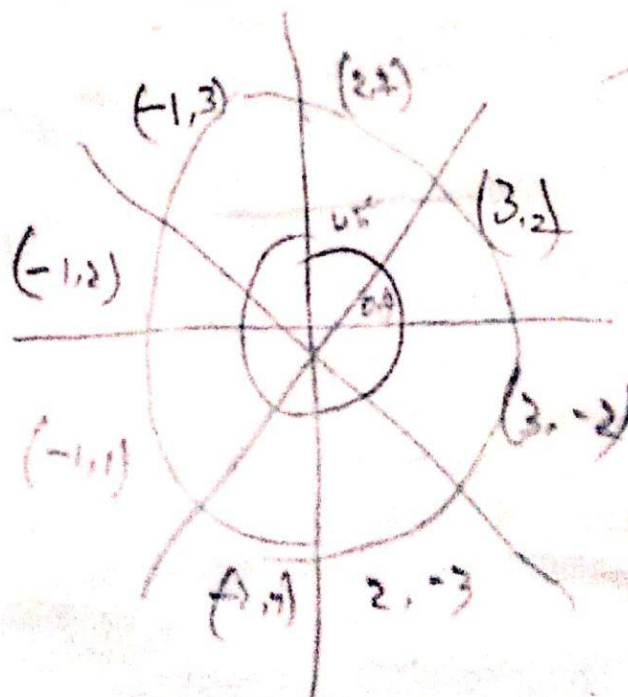
[N.B. The figures in the right margin indicate full marks. Answer any four questions.]

- |   | Marks |
|---|-------|
| 1. (a) What do you mean by interactive graphics system? Explain the conceptual framework for interactive graphics.  | 6     |
| (b) What is scan conversation? Describe the side effects of scan conversation.  | 4     |
| (c) Write down the differences between computer graphics and image processing.  | 4     |
| (d) Describe the midpoint algorithm for scan converting a circle.   | 6     |
| 2. (a) Describe the YIQ and CMYK color model.   | 5     |
| (b) Describe the eight-way symmetry of a circle.  | 5     |
| (c) What are the advantages of Bresenham line algorithm over DDA algorithm.   | 4     |
| (d) Define the following terms:   | 3×2=6 |
| (i) MIDI.   |       |
| (ii) RGB Color Model.   |       |
| (iii) Animation.  |       |
| 3. (a) What is projection? What are the various types of projections?   | 1+3=4 |
| (b) Describe Bresenham's algorithm for scan converting a line.  | 6     |
| (c) Write down the differences between raster display and vector display.   | 4     |
| (d) Explain applications of computer graphics.  | 6     |
| 4. (a) What is initial parameter ( $P_0$ ) of Midpoint circle drawing algorithm? Consider a circle has radius $r=10$ and initial point, $P_0(0, 10)$ . Now plot the circle according to Midpoint algorithm. | 6     |
| (b) Briefly discuss Scan-line Polygon Filling algorithm.  | 4     |
| (c) What is transformation? Differentiate between Geometric and Coordinate transformation.  | 4     |
| (d) Discuss Translation, Scaling and Rotation with mathematical equation.   | 6     |

[Please turn over



	Marks
5. (a) What is clipping? How does Cohen Sutherland line clipping algorithm work to detect a line for clipping?	6
(b) Define Hidden Surface Problem. What kinds of problems that we faced in hidden surface problem?	4
(c) How does the Z-Buffer algorithm determine which surfaces are hidden? Explain.	6
(d) Discuss Painter's algorithm for visible surface determination.	4
6. (a) Define wire frame model. How can we use wire frame model to design an object?	5
(b) Define Window and Viewport. Convert Window-to-Viewport coordinate.	5
(c) How do we get normals for phong shading? At what points are these normals calculated?	6
(d) Differentiate between interpolation and approximation curve.	4



B.Sc (HONS.) IN CSE FOURTH YEAR SEVENTH SEMESTER  
EXAMINATION, 2021

**E-COMMERCE AND WEB ENGINEERING**

*[According to the New Syllabus]*

**Subject Code : 540207**

**Examination Code-5617**

Time—3 hours

Full marks—80

*[N.B. The figures in the right margin indicate full marks. Answer any four questions.]*

- |   | Marks      |         |            |         |  |        |  |  |         |  |  |      |  |
|---|------------|---------|------------|---------|--|--------|--|--|---------|--|--|------|--|
| 1. (a) What is E-commerce? What are the advantages of E-commerce transaction?   | 5          |         |            |         |  |        |  |  |         |  |  |      |  |
| (b) Explain the working principle of B2B E-commerce with block diagram.   | 5          |         |            |         |  |        |  |  |         |  |  |      |  |
| (c) Describe basic payment methods commonly used in E-commerce system.  | 4          |         |            |         |  |        |  |  |         |  |  |      |  |
| (d) Define the term Digital Government and E-governance. What are the challenges of web security?   | 6          |         |            |         |  |        |  |  |         |  |  |      |  |
| 2. (a) Write down the basic structure of a website. Which components are needed to create a fully dynamic webpage?  | 4+2=6      |         |            |         |  |        |  |  |         |  |  |      |  |
| (b) Write down the differences between static and dynamic website.  | 4          |         |            |         |  |        |  |  |         |  |  |      |  |
| (c) Describe common features of web server.   | 5          |         |            |         |  |        |  |  |         |  |  |      |  |
| (d) Why is SEO used? Which is better on page SEO or Offpage SEO? Explain with diagrams.   | 5          |         |            |         |  |        |  |  |         |  |  |      |  |
| 3. (a) What is tag? Briefly explain different uses of <meta> and <link> tag.  | 4          |         |            |         |  |        |  |  |         |  |  |      |  |
| (b) What is HTML attributes? Explain the HTML elements.   | 5          |         |            |         |  |        |  |  |         |  |  |      |  |
| (c) Write down the CSS and HTML code to design the following menu:  | 7          |         |            |         |  |        |  |  |         |  |  |      |  |
| <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse; text-align: center;"> <tr> <td>HOME</td> <td>DEPARTMENT</td> <td>CONTACT</td> </tr> <tr> <td></td> <td>BANGLA</td> <td></td> </tr> <tr> <td></td> <td>ENGLISH</td> <td></td> </tr> <tr> <td></td> <td>MATH</td> <td></td> </tr> </table> |            | HOME    | DEPARTMENT | CONTACT |  | BANGLA |  |  | ENGLISH |  |  | MATH |  |
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|   | BANGLA     |         |            |         |  |        |  |  |         |  |  |      |  |
|   | ENGLISH    |         |            |         |  |        |  |  |         |  |  |      |  |
|   | MATH       |         |            |         |  |        |  |  |         |  |  |      |  |
| (d) Write down different style sheet approaches. Which one is best and why?   | 4          |         |            |         |  |        |  |  |         |  |  |      |  |

*[Please turn over]*



4. (a) What is scripting language? Write down the differences between GET and POST method. 1+4=5
- (b) Write down the differences between programming language and scripting language. 5
- (c) Discuss some common mistakes in java scripts. 5
- (d) Write a java script program to calculate the Fibonacci series. 5
5. (a) What is PHP? Write down the process of running a PHP script on a webserver. 5
- (b) What are the different types of PHP variables? 5
- (c) Briefly explain a simple PHP form validation with example. 5
- (d) Explain the procedure of retrieving data using PHP. 5
6. (a) What are the features that made My SQL a popular database management system? 5
- (b) Briefly explain basic My SQL functions used in PHP. 5
- (c) What are the main differences between CHAR and VARCHAR? 3
- (d) Create the following table in SQL and write PHP code to insert values in a 'Student' table— 7
- Student (Name, Roll, DOB).