

450

Roll No. _____

[Total No. of Pages : 2]

8E1811

8E1811

B.Tech. VIII Sem. (Main/Back) Examination, June - 2022
Electronics and Comm. Engg.
8EC5-11 Artificial Intelligence and Expert Systems

Time : 3 Hours

Maximum Marks : 120
 Min. Passing Marks : 42

Instructions to Candidates:

Attempt all Ten questions from Part A, five questions out of Seven from Part B and Four questions out of Five from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A

(Answer should be given up to 25 words only)

All questions are **compulsory**

(10×2=20)

1. What is state space search.
2. What is conflict resolution strategies?
3. What is decision tree?
4. What is a Rule Based learning.
5. What is Production system?
6. What is an agent?
7. What is an expert system?
8. What is a frame problem.
9. What is Artificial Intelligence?
10. What is Neural Network?

PART - B

(Analytical/Problem solving questions)

Attempt any **Five** questions

(5×8=40)

1. Write the characteristics of production system, with various types of production systems.

2. Discuss comparison between informed search and uninformed search with various types of control strategies.
3. What do you mean by natural language processing? Explain in brief.
4. Explain water - Jug problem.
5. Represent following statements in Predicate logic -
- Raju only likes to see Hindi - movies.
 - It is safe to assume a movie is American unless explicitly told otherwise.
 - The playhouse rarely shows foreign films.
 - People do not do things that will cause them to be in situations they do not like.
 - Rama does not go to the playhouse very often.
6. What is knowledge representation? Discuss various approaches and issues in knowledge Representation.
7. What is the role of decision tree in inductive learning? Explain in Brief.

PART - C

(Descriptive/Analytical/Problem Solving/Design questions)

Attempt any **Four** questions

(4×15=60)

- What are the concepts of semantic net in knowledge representation? Explain the theory of conceptual dependency using suitable diagram.
 - Why does the search in game playing always proceed forward from the current position rather than backward from goal state?
 - Explain Baye's theorem and prove how fuzzy logic is different from binary logic with example.
 - Explain the resolution principle by taking example. Write steps followed in the resolution.
 - Explain why predicate logic is better approach than propositional logic for knowledge representation. Give some example also.
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402

8E1812	Roll No. _____	[Total No. of Pages : 3]
	8E1812	
	B.Tech. VIII Sem. (Main/Back) Examination, June - 2022 Electronics & Communication Engineering 8EC5-12 Digital Image and Video Processing	

Time : 3 Hours**Maximum Marks : 120****Min. Passing Marks : 42****Instructions to Candidates:**

Attempt all 10 questions from Part A, Five questions out of Seven from Part B and four questions out of five from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination (As mentioned in form No. 205)

PART - A

(Answer should be given up to 25 words only)

All questions are compulsory

(10×2=20)

1. Define digital Image.
2. Specify the elements of Digital Image Processing system.
3. Define sampling and quantization.
4. What are wavelet packets?
5. What is colour slicing?
6. What is image translation and scaling?
7. Define the image sensing
8. Write the function of video encoder and decoder.

- 6052
9. What do you mean by Gray level?
 10. Find the number of bits required to store a 256 X 256 image with 32 gray levels

PART - B

(Analytical/Problem solving questions)

Attempt any five questions

(5×8=40)

1. Explain colour vision model with example.
2. Explain sub band filter banks with suitable diagram.
3. Explain JPEG compression techniques with example.
4. Discuss about MPEG compression standard.
5. Explain the properties of Fourier Transform in details.
6. Explain the Discrete Cosine Transform used in image processing.
7. Explain the working principle of colour model - RGB in colour image processing.
8. Explain the technique of threshold for segmentation.

PART - C

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any FOUR questions

(4×15=60)

1. Why we have Need of HSI model in image processing. Provide the relationship between RGB and HSI colour model with suitable example.
2. What is Lossless Image Compression and how it works write the advantages of Lossless Compression Techniques. Also explain when you should use of these techniques in Image Processing.

604

3. Explain the effectiveness of video segmentation techniques of different categories of videos.
 4. Explain the relationship between pixels, image acquisition system and imaging geometry.
 5. Explain forward and backward motion vectors for interpolative prediction of videos in image processing.
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405

Roll No. _____

[Total No. of Pages : 2]

8E1847

8E1847

B.Tech. VIII Sem. (Main/Back) Examination, June - 2022

Open Elective - II

8CS6-60.1 Big Data Analytics

Time : 3 Hours

Maximum Marks : 120

Min. Passing Marks : 42

Instructions to Candidates:

Attempt all Ten questions from Part A, Five questions out of Seven questions from Part B and Four questions out of Five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No.205)

PART - A

(Answer should be given up to 25 words only)

All questions are compulsory.

(10×2=20)

1. List out the terminologies included in Hadoop Building blocks.
2. Write code for Writable Interface.
3. Describe 3 V's of Big Data.
4. Differentiate between Pseudo distributed mode and fully distributed mode.
5. What is Hadoop API?
6. List out the Writable Classes.
7. List the features of Apache Pig.
8. Draw Hive Architecture diagram.
9. Benefit of Apache Pig.
10. List the limitation of Apache Hive.

PART - B

(Analytical/Problem solving questions)

Attempt any Five questions.

(5×8=40)

1. Describe GFS and HDFS architecture and functionalities.
2. Explain how the Hive is put together and also explain the working with Hive data types.
3. Explain Word Count programs of Hadoop Map Reduce. Also explain all 6 pipeline technologies of Map Reduce.

4. Explain the Application Flow of the Pig Latin.
5. Explain Pig Architecture and Pig script interface.
6. Explain the Hadoop API for Map Reduce Framework (Old & New).
7. Describe Hadoop I/O writable Interface and Writable Comparable. Also explain the Writable Classes with example.

PART - C

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any **four** questions.

(4×15=60)

1. Explain about the implementation of raw comparator and custom raw comparator with an example.
 2. Explain the Working through the ABCs of Pig Latin. And also explain Word Count Program using Pig Script.
 3. Explain the three type of Hadoop complete cluster configurations.
 4. Explain Hive working and Word Count program using Hive query.
 5. Write custom Writable and Writable Comparable program.
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407

Roll No. _____

[Total No. of Pages : 2]

8E1852

8E1852

B.Tech. VIII Sem (Main/Back) Examination, June - 2022

Open Elective - II

8EC6-60.2 - Robotics and Control

Time : 3 Hours

Maximum Marks : 120

Min. Passing Marks : 42

Instructions to Candidates:

Attempt **all Ten** questions from **Part A**, **Five** questions out of **Seven** questions from **Part B** and **Four** questions out of **Five** questions from **Part C**.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No.205)

PART - A

(Answer should be given up to 25 words only)

All questions are **compulsory**

(10×2=20)

1. Differentiate Open Loop System and Close Loop System.
2. Differentiate Preprocessing & Enhancement Techniques in Imaging.
3. What do you mean by Sensor? Write the name of sensors used in Robotics.
4. Differentiate flexible automation and fixed automation.
5. What is Steady State error?
6. What do you mean by Image Acquisition?
7. Define transfer function. Write the standard form of transfer function for First and Second Order system.
8. What do you mean by Synchro's?
9. Give any two application of robots in the field of medicine.
10. Differentiate the low and high level vision in robotics.

PART - B

(Analytical/Problem solving questions)

Attempt any **Five** questions

(5×8=40)

1. What is an industrial robot? State its applications in industry?
2. Sketch and explain various types of joints in manipulator mechanisms.
3. What do you mean by Actuators? Explain various types actuators with an example.
4. What do you mean by robot vision? Explain briefly.

- 58
5. Explain Electrical Analogies of Mechanical Systems.
 6. With suitable diagrams Explain Pitch, Yaw and Roll motions as concerned with a robotic manipulator.
 7. Explain Smart City Security Architecture.

PART - C

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any **four** questions

(4×15=60)

1. What are the proximity sensors? List various range sensors used in mobile robots, also explain three major limitations of sonar sensor.
 2. Define direct and inverse kinematics, Draw and explain various joint link parameters, and also derive an equation for basic link transformation matrix by considering geometric relationship between adjacent links.
 3. What is low level vision? Explain the block diagram of CCD line scanner sensor and also show the continuous image sampled uniformly in to an array of N rows and M columns, also quantities each sample in the form of Intensity.
 4. State Nyquist stability Criteria. Derive the expression of output for second order system with $\varepsilon < 1$ when subjected to unit step input.
 5. What do you mean by Frequency & Time domain analysis? Explain the performance specification parameters of both the domain and the correlation between time and frequency domain.
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909



Total No. of Questions:

Total No. of Pages:

Roll No. _____

B.Tech. VIII Sem(Main) Exam 2021

Open Elective -II

**8EC6-60.1 Open Elective-II Industrial and Medical Applications of
RF Energy**

8E1851

Time: 3 Hours

Maximum Marks: 120

Min. Passing Marks: 42

Attempt all ten questions from Part A, five question out of seven from Part B and four questions out of five from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No.205)

1. _____

2. _____

Part A (Answer should be given up to 25 words only)

All questions are compulsory

- Q.1 What is ISM Band?
- Q.2 Explain the MW sources?
- Q.3 Describe the axial wave applicators?
- Q.4 Explain application of travelling wave?
- Q.5 Describe an elastomers?
- Q.6 Give advantages of microwave processing?
- Q.7 What is process of drying?
- Q.8 Describe a challenge of hyperthermia treatment?
- Q.9 Explain the hazards related to mobile handset?
- Q.10 Explain the cell membrane?

10 x 2 = 20

Part B (Analytical/Problem solving questions)

Attempt any Five questions

- Q.1 Describe the scope and outcome of industrial and medical application of RF energy?
- Q.2 Explain the concept of electromagnetic spectrum with its pros and cons?
- Q.3 Describe complex dielectric constant for RF heating?
- Q.4. Explain the standing wave with its applications?

- 47
- Q.5 Describe the concept of thawing and tempering in food industry and explain its challenges?
Q.6 Explain the biological effect on cells of medical applications?
Q.7 Explain the safety precautions for biomedical equipments with example?

5 x 8 = 40

Part C(Descriptive/Analytical/Problem Solving/Design questions)
Attempt any four questions

- Q. 1 By help of suitable model explain the propagation reflection and transmission?
Q.2 With respect to RF heating simulate the magnetic loss factor, specific heat and rate of rise of temperature?
Q.3 What do you mean by applicators, explain travelling wave applicators with associated challenges and application?
Q.4 Describe the cooking mechanism and animal production process by help of block diagrams?
Q.5 Explain the basic interaction with cell membrane and thermal interaction with living organism by help of suitable diagram?

4 x 15 = 60