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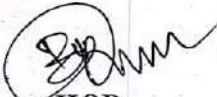
2021-2022

Department of Electrical and Electronics Engineering

21EE01- Electric Vehicle Technology

MARK SHEET

| Sl. No | Register Number | Student Name | MARKS |
|--------|-----------------|---------------|-------|
| 1 | 18TE0852 | MAHALAKSHMI.M | 88 |
| 2 | 18TC1207 | KAVITHA.U | 92 |


HOD




PRINCIPAL

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL

RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
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Puducherry - 605 110



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VALUE ADDED COURSES

2021-2022

Department of Electrical and Electronics Engineering

21EE01- Electric Vehicle Technology

NAME:

CLASS:

DATE:

1. When was the first electric car invented?

- a) 1830
- b) 1985
- c) 1832
- d) 1945

Answer: c

2. The moving coil instrument measures the _____ of the signal.

- a) Average value
- b) R.M.S value
- c) Zero value
- d) Half value


Answer: b

3. The PMMC instrument measures the average value of the signal.

- a) True
- b) False

Answer: a




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4. Which of the relationship is correct in Ferromagnetic motor?

- a) $T \propto (I_a)^2$
- b) $T \propto (I_a)^0$
- c) $T \propto I_a$
- d) $T^2 \propto I_a$

Answer: c

5. Calculate Fill factor using the data: $P_{max}=5$ W, $V_{oc}=0$ V, $I_{sc}=1$ A.

- a) ∞
- b) 3
- c) 2
- d) 1

Answer: a

6. Electric Vehicles are generally powered by _____

- a) Aluminum batteries
- b) Lead-acid batteries
- c) Sodium batteries
- d) Magnesium batteries

Answer: b




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7. Calculate the line voltage in star connection when phase voltage=315 V.

- a) 545.5 V
- b) 548.6 V
- c) 547.8 V
- d) 585.8 V

Answer: a

8. Who coined the term battery?

- a) George Franklin
- b) Benjamin Fernandes
- c) Benjamin Franklin
- d) George Bush


Answer: c

9. Who invented the battery?

- a) Alessandro Volta
- b) Alexander Bell
- c) Alessandro Bell
- d) Tim Southee

Answer: a




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10. Combination of cells is known as the battery.

- a) True
- b) False

Answer: a

11. Calculate the active power in a 315 F capacitor.

- a) 45 W
- b) 81 W
- c) 0 W
- d) 64 W

Answer: c

12. Calculate the frequency of the waveform $v(t) = \sin(\pi t + \pi/4) + \sin(\pi t + \pi/74) + \sin(\pi t + \pi/56)$.

- a) .1 Hz
- b) .8 Hz
- c) .5 Hz
- d) .2 Hz


Answer: c

13. The diode conducts only when current flows from anode to cathode.

- a) True
- b) False

Answer: a




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14. Full form of EV is _____

- a) Energy voltage
- b) Electric vehicles
- c) Electric voltage
- d) Energy vehicles

Answer: b

15. Full form of ICV is _____

- a) Internal combustion vehicles
- b) Internet combustion vehicles
- c) Internally combined vehicles
- d) Internet combined vehicles

Answer: b

16. Electric trains are of two types.

- a) True
- b) False

Answer: a

17. The shape of pantograph collector is _____

- a) Square
- b) Pentagon
- c) Circle




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d) Hexagon

Answer: b

18. There are typically three types of pantograph.

a) True

b) False

Answer: a

19. Full form of EMU is _____

a) Electronics Multiple Unit

b) Electrical Multiple Unit

c) Electrical Multiple Usage

d) Electrical Multiple User

Answer: b

20. Who is known as the Father of Indian Railways?

a) Lord Dalhousie

b) Lord Ripon

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Answer: a


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21. Who built the first train?

- a) Richardson
- b) Rampa
- c) Richard Trevithick
- d) John Carry

Answer: c

22. Who built the first bullet train?

- a) Hideo Rampa
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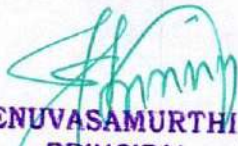
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23. The supply conductor in electric trains is also known as _____

- a) Contact Wire
- b) Contact Distance
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Answer: a




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24. Calculate the value measured by PMMC when a sinusoidal voltage signal is applied to it.

- a) 15 V
- b) 0 V
- c) 16 V
- d) 18 V

Answer: b

25. Calculate the value measured by Moving Iron when a sinusoidal voltage signal $V(t)=20\sin(\omega t)$ is applied to it.

- a) 14.14 V
- b) 20.15 V
- c) 16.18 V
- d) 22.18 V

Answer: a




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21EE01- Electric Vehicle Technology

NAME: KAVITHA U

CLASS: IV/EEE

DATE: 20/08/2021

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23

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92%

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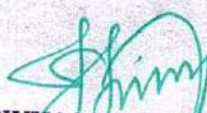
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VALUE ADDED COURSES

2021-2022

Department of Electrical and Electronics Engineering

21EE02- Machine Learning and Deep Learning

NAME: KAVIMANJ.M

CLASS: III / EEE

DATE: 20/08/2021

1. What is Machine learning?

- a) The selective acquisition of knowledge through the use of computer programs
- b) The selective acquisition of knowledge through the use of manual programs
- c) The autonomous acquisition of knowledge through the use of computer programs
- d) The autonomous acquisition of knowledge through the use of manual programs

2. K-Nearest Neighbors (KNN) is classified as what type of machine learning algorithm?

- a) Instance-based learning
- b) Parametric learning
- c) Non-parametric learning
- d) Model-based learning

24
25

96%

3. Which of the following is not a supervised machine learning algorithm?

- a) K-means
- b) Naïve Bayes
- c) SVM for classification problems
- d) Decision tree

4. What's the key benefit of using deep learning for tasks like recognizing images?

- a) They need less training data than other methods.
- b) They're easier to explain and understand than other models.
- c) They can learn complex details from the data on their own.
- d) They work faster and are more efficient computationally.

5. Which algorithm is best suited for a binary classification problem?

- a) K-nearest Neighbors
- b) Decision Trees
- c) Random Forest
- d) Linear Regression

6. What is the key difference between supervised and unsupervised learning?

- a) Supervised learning requires labeled data, while unsupervised learning does not.
- b) Supervised learning predicts labels, while unsupervised learning discovers patterns.
- c) Supervised learning is used for classification, while unsupervised learning is used for regression.
- d) Supervised learning is always more accurate than unsupervised learning.

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7. Which type of machine learning algorithm falls under the category of “unsupervised learning”?

- a) Linear Regression
- b) K-means Clustering
- c) Decision Trees
- d) Random Forest

8. Which of the following statements is true about AdaBoost?

- a) It is particularly prone to overfitting on noisy datasets
- b) Complexity of the weak learner is important in AdaBoost
- c) It is generally more prone to overfitting
- d) It improves classification accuracy

9. Which one of the following models is a generative model used in machine learning?

- a) Support vector machines
- b) Naïve Bayes
- c) Logistic Regression
- d) Linear Regression

10. An artificially intelligent car decreases its speed based on its distance from the car in front of it. Which algorithm is used?

- a) Naïve-Bayes
- b) Decision Tree
- c) Linear Regression
- d) Logistic Regression

11. Which of the following statements is false about Ensemble learning?

- a) It is a supervised learning algorithm
- b) It is an unsupervised learning algorithm
- c) More random algorithms can be used to produce a stronger ensemble
- d) Ensembles can be shown to have more flexibility in the functions they can represent

12. Which of the following statements is true about stochastic gradient descent?

- a) It processes one training example per iteration
- b) It is not preferred, if the number of training examples is large
- c) It processes all the training examples for each iteration of gradient descent
- d) It is computationally very expensive, if the number of training examples is large

13. Decision tree uses the inductive learning machine learning approach.

- a) False
- b) True




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14. What elements describe the Candidate-Elimination algorithm?

- a) depends on the dataset
- b) just a set of candidate hypotheses
- c) just a set of instances
- d) set of instances, set of candidate hypotheses

15. Which of the following statements is not true about boosting?

- a) It mainly increases the bias and the variance
- b) It tries to generate complementary base-learners by training the next learner on the mistakes of the previous learners
- c) It is a technique for solving two-class classification problems
- d) It uses the mechanism of increasing the weights of misclassified data in preceding classifiers

16. What is present in the version space of the Find-S algorithm in the beginning?

- a) Set of all hypotheses H
- b) Both maximally general and maximally specific hypotheses
- c) Maximally general hypothesis
- d) Maximally specific hypothesis

17. When does the hypothesis change in the Find-S algorithm, while iteration?

- a) Any example (positive or negative) is encountered
- b) Any negative example is encountered
- c) Positive Example inconsistent with the hypothesis is encountered
- d) Any positive example is encountered

18. What is one of the assumptions of the Find-S algorithm?

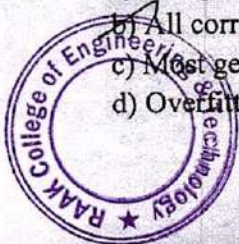
- a) No assumptions are made
- b) The most specific hypothesis is also the most general hypothesis
- c) All training data are correct (there is no noise)
- d) Overfitting does not occur

19. What is one of the advantages of the Find-S algorithm?

- a) Computation is faster than other concept learning algorithms
- b) All correct hypotheses are output
- c) Most generalized hypothesis is output
- d) Overfitting does not occur

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21. How does the hypothesis change gradually?

- a) Specific to Specific
- b) Specific to General
- c) General to Specific
- d) General to General

22. $S = \langle \phi, \phi, \phi \rangle$ Training data = $\langle \text{rainy, cold, white} \rangle \Rightarrow$ No (negative example). How will S be represented after encountering this training data?

- a) $\langle \phi, \phi, \phi \rangle$
- b) $\langle \text{sunny, warm, white} \rangle$
- c) $\langle \text{rainy, cold, black} \rangle$
- d) $\langle ?, ?, ? \rangle$

23. What is one of the drawbacks of the Find-S algorithm?

- a) Computation cost is high
- b) Time-ineffective
- c) All correct hypotheses are not output
- d) Most specific accurate hypothesis is not output

24. Noise or errors in the dataset can severely affect the performance of the Find-S algorithm.

- a) True
- b) False

25. The algorithm accommodates all the maximally specific hypotheses.

- a) True
- b) False




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Certificate of Completion

2021-2022

This is to certify that Mr/Ms KAVITHA.....

Year..... Department. E.E.E... has successfully Completed the Value added course.

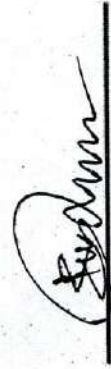
SCORE: 92.....

COURSE

COURSE

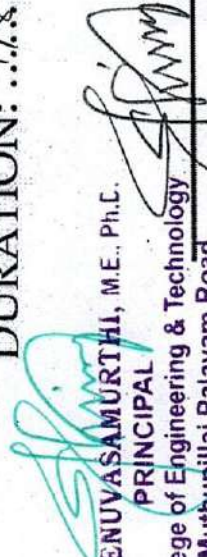
TITLE: ELECTRIC VEHICLE TECHNOLOGY

DURATION: 9.8.21 to 11.8.21



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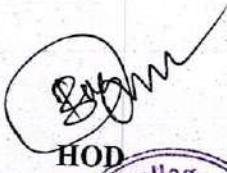
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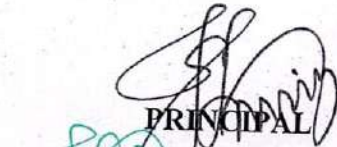
21EE02- Machine Learning and Deep Learning

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| 1 | 19TE0551 | NIRMAL GEORGE.A | 96 |
| 2 | 19TE0552 | BRANAN.D | 88 |
| 3 | 19TE0553 | SANJAIDHARAN.G | 84 |
| 4 | 19TE0554 | KEERTHIKA.N | 88 |
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Answer: a

4. What's the key benefit of using deep learning for tasks like recognizing images?

- a) They need less training data than other methods.
- b) They're easier to explain and understand than other models.
- c) They can learn complex details from the data on their own.
- d) They work faster and are more efficient computationally.

Answer: c

5. Which algorithm is best suited for a binary classification problem?

- a) K-nearest Neighbors
- b) Decision Trees
- c) Random Forest
- d) Linear Regression


Answer: b

6. What is the key difference between supervised and unsupervised learning?

- a) Supervised learning requires labeled data, while unsupervised learning does not.
- b) Supervised learning predicts labels, while unsupervised learning discovers patterns.
- c) Supervised learning is used for classification, while unsupervised learning is used for regression.
- d) Supervised learning is always more accurate than unsupervised learning.

Answer: a




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7. Which type of machine learning algorithm falls under the category of “unsupervised learning”?

- a) Linear Regression
- b) K-means Clustering
- c) Decision Trees
- d) Random Forest

Answer: b

8. Which of the following statements is true about AdaBoost?

- a) It is particularly prone to overfitting on noisy datasets
- b) Complexity of the weak learner is important in AdaBoost
- c) It is generally more prone to overfitting
- d) It improves classification accuracy

Answer: c

9. Which one of the following models is a generative model used in machine learning?

- a) Support vector machines
- b) Naïve Bayes
- c) Logistic Regression
- d) Linear Regression

Answer: b

10. An artificially intelligent car decreases its speed based on its distance from the car in front of it. Which algorithm is used?

- a) Naïve-Bayes
- b) Decision Tree




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- c) Linear Regression
- d) Logistic Regression

Answer: c

11. Which of the following statements is false about Ensemble learning?

- a) It is a supervised learning algorithm
- b) It is an unsupervised learning algorithm
- c) More random algorithms can be used to produce a stronger ensemble
- d) Ensembles can be shown to have more flexibility in the functions they can represent

Answer: b

12. Which of the following statements is true about stochastic gradient descent?

- a) It processes one training example per iteration
- b) It is not preferred, if the number of training examples is large
- c) It processes all the training examples for each iteration of gradient descent
- d) It is computationally very expensive, if the number of training examples is large

Answer: a

13. Decision tree uses the inductive learning machine learning approach.

- a) False
- b) True

Answer: b

14. What elements describe the Candidate-Elimination algorithm?

- a) depends on the dataset
- b) just a set of candidate hypotheses
- c) just a set of instances




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d) set of instances, set of candidate hypotheses

Answer: d

15. Which of the following statements is not true about boosting?

- a) It mainly increases the bias and the variance
- b) It tries to generate complementary base-learners by training the next learner on the mistakes of the previous learners
- c) It is a technique for solving two-class classification problems
- d) It uses the mechanism of increasing the weights of misclassified data in preceding classifiers

Answer: a

16. What is present in the version space of the Find-S algorithm in the beginning?

- a) Set of all hypotheses H
- b) Both maximally general and maximally specific hypotheses
- c) Maximally general hypothesis
- d) Maximally specific hypothesis

Answer: d

17. When does the hypothesis change in the Find-S algorithm, while iteration?

- a) Any example (positive or negative) is encountered
- b) Any negative example is encountered
- c) Positive Example inconsistent with the hypothesis is encountered
- d) Any positive example is encountered

Answer: c




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18. What is one of the assumptions of the Find-S algorithm?

- a) No assumptions are made
- b) The most specific hypothesis is also the most general hypothesis
- c) All training data are correct (there is no noise)
- d) Overfitting does not occur

Answer: c

19. What is one of the advantages of the Find-S algorithm?

- a) Computation is faster than other concept learning algorithms
- b) All correct hypotheses are output
- c) Most generalized hypothesis is output
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Answer: a

20. What is one of the advantages of the Find-S algorithm?

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Answer: a




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21. How does the hypothesis change gradually?

- a) Specific to Specific
- b) Specific to General
- c) General to Specific
- d) General to General

Answer: b

22. $S = \langle \phi, \phi, \phi \rangle$ Training data = $\langle \text{rainy, cold, white} \rangle \Rightarrow$ No (negative example). How will S be represented after encountering this training data?

- a) $\langle \phi, \phi, \phi \rangle$
- b) $\langle \text{sunny, warm, white} \rangle$
- c) $\langle \text{rainy, cold, black} \rangle$
- d) $\langle ?, ?, ? \rangle$

Answer: a

23. What is one of the drawbacks of the Find-S algorithm?

- a) Computation cost is high
- b) Time-ineffective
- c) All correct hypotheses are not output
- d) Most specific accurate hypothesis is not output

Answer: a

24. Noise or errors in the dataset can severely affect the performance of the Find-S algorithm.

- a) True
- b) False

Answer: a



S. Seenuvasamurthi
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25. The algorithm accommodates all the maximally specific hypotheses.

a) True

b) False

Answer: b




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VALUE ADDED COURSES

2021-2022

Department of Electrical and Electronics Engineering

21EE02- Machine Learning and Deep Learning

NAME: KAVIMANI.M

CLASS: III / EEE

DATE: 20/08/2021

1. What is Machine learning?

- a) The selective acquisition of knowledge through the use of computer programs
- b) The selective acquisition of knowledge through the use of manual programs
- c) The autonomous acquisition of knowledge through the use of computer programs
- d) The autonomous acquisition of knowledge through the use of manual programs

2. K-Nearest Neighbors (KNN) is classified as what type of machine learning algorithm?

- a) Instance-based learning
- b) Parametric learning
- c) Non-parametric learning
- d) Model-based learning

24
25

96%

3. Which of the following is not a supervised machine learning algorithm?

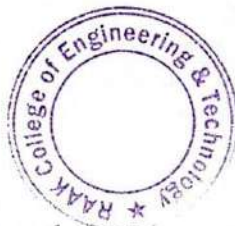
- a) K-means
- b) Naïve Bayes
- c) SVM for classification problems
- d) Decision tree

4. What's the key benefit of using deep learning for tasks like recognizing images?

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VALUE ADDED COURSES

2021-2022

Department of Electrical and Electronics Engineering

21EE03- Nano Electronics

MARK SHEET

| Sl. No | Register Number | Student Name | MARKS |
|--------|-----------------|-------------------|-------|
| 1 | 20TE0251 | ARUN.S | 96 |
| 2 | 20TE0252 | KANMANI.K | 88 |
| 3 | 20TE0253 | NALLARASAN.E | 84 |
| 4 | 20TE0254 | PRITHEESH KUMAR.R | 88 |
| 5 | 20TE0255 | VENKATESAN.S | 96 |
| 6 | 20TEL095 | ARUN.P | 92 |
| 7 | 20TEL097 | GOKUL.C | 92 |
| 8 | 20TEL098 | MARIYAPPAN.S | 92 |
| 9 | 20TEL099 | MOHAMED AASHIK.M | 96 |
| 10 | 20TEL100 | PUVIARASU.M | 88 |

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Certificate of Completion 2021-2022

This is to certify that Mr/Ms RAKESH.M.....

Year..... Department..... has successfully Completed the Value added course.

SCORE: 92.....

COURSE

MACHINE LEARNING AND

TITLE: DEEP LEARNING.....

COURSE

DURATION: 9/18/21...to...14/8/21





HOD



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VALUE ADDED COURSES

2021-2022

Department of Electrical Engineering

21EE03-Nano Electronics

NAME:

CLASS:

DATE:

1. Which of the following is a potential environmental application of nanotechnology?

- a) Carbon emissions
- b) Oil spill cleanup
- c) Deforestation
- d) Plastic production

Answer: b

2. Which technique is commonly used for the fabrication of nanoparticles?

- a) Sedimentation
- b) Filtration
- c) Distillation
- d) Lithography

Answer: d

3. What is the typical size range of nanoparticles?

- a) 1 to 100 millimeters
- b) 1 to 100 micrometers
- c) 1 to 100 nanometers
- d) 1 to 100 picometers

Answer: c



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4. Which of the following is not used as a tool for Nanotribology studies?

- a) Compound Microscope
- b) AFM (Atomic Force Microscope)
- c) STM (Scanning Tunneling Microscope)
- d) SPM (Scanning Probe Microscope)

Answer: a

5. Which of the following is not considered as a subfield of computational nanotechnology?

- a) Electrochemistry
- b) Nanoinformatics
- c) Nano-device simulation
- d) Molecular modeling

Answer: a

6. Which of the following is not an advantage of nanowires?

- a) High electron mobility
- b) Shorter response time
- c) Greater dielectric constant
- d) Asymmetric electron-hole characteristic

Answer: d

7. Which of the given option is incorrect about nano informatics.

- a).It is used in the development and comparative characterization of nanomaterials
- b) It improves environmental health
- c) It is limited to collecting and sharing of data about nanotechnologies
- d) It applies techniques of data mining machine learning, product designing, logistics and optimization



[Signature]
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8. What is the major drawback of the advanced numerical techniques in nanofluidics?

- a) High computational cost
- b) Time consuming
- c) Poor understanding of atomistic behavior in confined nanoscale transport
- d) Very low accuracy and precision

Answer: a

9. What is the term used to describe the self-assembly of nanoparticles into ordered structures?

- a) Nanomorphosis
- b) Nanoassembly
- c) Nanosynthesis
- d) Nanoscale patterning

Answer: b

10. Why is the conductivity of a nanowire much less than that of the corresponding bulk material?

- a) Due to precise control of the heating mechanism
- b) Due to greater mean free path
- c) Due to scattering from wire boundaries
- d) Due to the response of nanowires to an applied load

Answer: c

11. Choose the correct statement from the give options.

- a) Quantum Cellular Automata (QCA) provides an interconnected method of information exchange
- b) Basic operation of a spin device depends on the anti-ferromagnetic materials




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- c) Quantum computing avoids the usage of interference properties of entangle quantum mechanical particles
- d) High cost of CMOS fabrication plants is due to the non-defect tolerant lithographic fabrication methods

Answer: d

12. Who were the developers of the first MOSFET?

- a) Cyrus Tabery and Jakub Kedziersk
- b) Dawon Kahng and Mohamed Atalla
- c) Nick Lindert and Toru Kang
- d) Eiji Takada and Shibly Ahmed

Answer: b

13. Identify the types of set memory that is a miniature version of CMOS flash memory found in phones and MPEG music stick players.

- a) Gate memory
- b) Miniature flash memory
- c) Yano-type memory
- d) Coulomb blockade


Answer: b

14. Which of the following is not an advantage of nanowires?

- a) High electron mobility
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15. Esaki diodes use only one type of charge carriers during their operation.

- a) True
- b) False

Answer: b

16. What is the major downside to Yano-type Memory?

- a) Robustness of the memory node
- b) Little or no amplifications
- c) Mass production of the memory devices
- d) Scalability of the circuits

Answer: c

17. Why are super-miniature electronic ICs fully functional at nanoscale while mechanical devices are not?

- a) Greater volume
- b) Greater friction
- c) Greater surface area
- d) Greater power


Answer: b

18. Why does a p-n junction stop electrons from being transported through a system?

- a) Formation of depletion layer
- b) Presence of very high voltage
- c) Absence of impurities in silicon
- d) Swift transportation of electrons

Answer: a




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19. Who proposed molecular electronics?

- a) Ari Aviram
- b) Gordon Moore
- c) C.N.R. Rao
- d) James Chadwick

Answer: a

20. How can the transmission coefficient (T) be expressed for electrons undergoing quantum mechanical tunneling?

- a) $T \approx H/16E$
- b) $T \approx (16H/E)e^{-2\alpha b}$
- c) $T \approx E/16H$
- d) $T \approx (16E/H)e^{-2\alpha b}$

Answer: d

21. What is Qubit?

- a) Spin dependent tunneling of electrons
- b) Crossbar switch based electronics
- c) Non-volatile main memory for PCs
- d) A basic unit of quantum information

Answer: d

22. How does the ciliary movement of micro-organisms occur?

- a) Using normal frictional forces
- b) Using buoyant forces
- c) Using laminar forces
- d) Using casimir forces




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23. Why are Quantum dot lasers preferred to traditional semiconductor lasers?

- a) QD lasers have surface defects
- b) QD lasers have reduced electron-phonon interactions
- c) QD lasers have narrow emission line
- d) QD lasers have multiparticle Auger recombination

Answer: c

24. Who was the first manufacturer of Esaki diodes?

- a) Sony
- b) Samsung
- c) Nantero
- d) Hewlett Packard

Answer: a

25. Choose the correctly matched pair from the following.

- a) Nanophotonics – study of transport of ions
- b) Nanoionics – study of quantum mechanics
- c) Nanomechanics – study of electronic components
- d) Nanolithography – science of etching and writing on a surface

Answer: d




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VALUE ADDED COURSES

2021-2022

Department of Electrical Engineering
21EE03-Nano Electronics

NAME: ARUN.S

CLASS: II/EEE

DATE: 20/08/2021

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- c) Nano-device simulation
- d) Molecular modelling

6. Which of the following is not an advantage of nanowires?

- a) High electron mobility
- b) Shorter response time
- c) Greater dielectric constant
- d) Asymmetric electron-hole characteristic



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7. Which of the given option is incorrect about nanoinformatics.
- a) It is used in the development and comparative characterization of nanomaterials
 - b) It improves environmental health
 - c) It is limited to collecting and sharing of data about nanotechnologies
 - d) It applies techniques of data mining machine learning, product designing, logistics and optimization

8. What is the major drawback of the advanced numerical techniques in nanofluidics?
- a) High computational cost
 - b) Time consuming
 - c) Poor understanding of atomistic behavior in confined nanoscale transport
 - d) Very low accuracy and precision

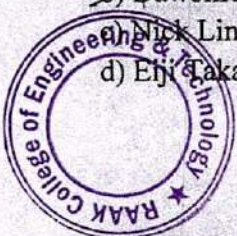
9. What is the term used to describe the self-assembly of nanoparticles into ordered structures?
- a) Nanomorphosis
 - b) Nanoassembly
 - c) Nanosynthesis
 - d) Nanoscale patterning


10. Why is the conductivity of a nanowire much less than that of the corresponding bulk material?
- a) Due to precise control of the heating mechanism
 - b) Due to greater mean free path
 - c) Due to scattering from wire boundaries
 - d) Due to the response of nanowires to an applied load

11. Choose the correct statement from the give options.
- a) Quantum Cellular Automata (QCA) provides an interconnected method of information exchange
 - b) Basic operation of a spin device depends on the anti-ferromagnetic materials
 - c) Quantum computing avoids the usage of interference properties of entangle quantum mechanical particles
 - d) High cost of CMOS fabrication plants is due to the non-defect tolerant lithographic fabrication methods

12. Who were the developers of the first MOSFET?

- a) Cyrus Tabery and JakubKedziersk
- b) DawonKahng and Mohamed Atalla
- c) Nick Lindert and Toru Kang
- d) Eiji Takada and Shibly Ahmed




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13. Identify the types of set memory that is a miniature version of CMOS flash memory found in phones and MPEG music stick players.

- a) Gate memory
- b) Miniature flash memory
- c) Yano-type memory
- d) Coulomb blockade

14. Which of the following is not an advantage of nanowires?

- a) High electron mobility
- b) Shorter response time
- c) Greater dielectric constant
- d) Asymmetric electron-hole characteristic

15. Esaki diodes use only one type of charge carriers during their operation.

- a) True
- b) False

16. What is the major downside to Yano-type Memory?

- a) Robustness of the memory node
- b) Little or no amplifications
- c) Mass production of the memory devices
- d) Scalability of the circuits

17. Why are super-miniature electronic ICs fully functional at nanoscale while mechanical devices are not?

- a) Greater volume
- b) Greater friction
- c) Greater surface area
- d) Greater power

18. Why does a p-n junction stop electrons from being transported through a system?

- a) Formation of depletion layer
- b) Presence of very high voltage
- c) Absence of impurities in silicon
- d) Swift transportation of electrons

19. Who proposed molecular electronics?

- a) Ari Aviram
- b) Gordon Moore
- c) C.N.R. Rao
- d) James Chadwick




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20. How can the transmission coefficient (T) be expressed for electrons undergoing quantum mechanical tunneling?

- a) $T \approx H/16E$
- b) $T \approx (16H/E)e^{-2ab}$
- c) $T \approx E/16H$
- d) $T \approx (16E/H)e^{-2ab}$

21. What is Qubit?

- a) Spin dependent tunneling of electrons
- b) Crossbar switch based electronics
- c) Non-volatile main memory for PCs
- d) A basic unit of quantum information

22. How does the ciliary movement of micro-organisms occur?

- a) Using normal frictional forces
- b) Using buoyant forces
- c) Using laminar forces
- d) Using casimir forces

23. Why are Quantum dot lasers preferred to traditional semiconductor lasers?

- a) QD lasers have surface defects
- b) QD lasers have reduced electron-phonon interactions
- c) QD lasers have narrow emission line
- d) QD lasers have multiparticle Auger recombination


24. Who was the first manufacturer of Esaki diodes?

- a) Sony
- b) Samsung
- c) Nantero
- d) Hewlett Packard

25. Choose the correctly matched pair from the following.

- a) Nanophotonics – study of transport of ions
- b) Nanoionics – study of quantum mechanics
- c) Nanomechanics – study of electronic components
- d) Nanolithography – science of etching and writing on a surface




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