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NPTEL (<https://swayam.gov.in/explorer?ncCode=NPTEL>) » Research Methodology (course)

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Course outline

How does an
NPTEL
online
course
work? ()

Week 1:
Group
Discussion
on Research
()

● Part 1 (unit?
unit=16&lesso
n=17)

● Part 2 (unit?
unit=16&lesso
n=18)

● Part 3 (unit?
unit=16&lesso
n=19)

● Part 4 (unit?
unit=16&lesso
n=20)

Week 1: Assignment 1

The due date for submitting this assignment has passed.

Due on 2023-08-30, 23:59 IST.

Assignment submitted on 2023-08-30, 21:48 IST

1) What distinguishes a research degree from other degrees?

1 point

- ☐ Emphasis on acquiring practical skills and hands-on experience.
- ☐ Focus on developing critical thinking and analytical abilities.
- ☒ Specialized knowledge in a specific field.
- ☐ Completion of coursework and examinations.

Yes, the answer is correct.

Score: 1

Accepted Answers:

Specialized knowledge in a specific field.

2) What distinguishes a textbook from a research paper?

1 point

- ☒ Textbooks provide accumulated knowledge, while research papers explore new frontiers.
- ☐ Textbooks are organized and systematic, while research papers are more abstract.
- ☐ Textbooks focus on learning, while research papers push the boundaries of knowledge.
- ☐ Textbooks offer predictable outcomes, while research papers are unpredictable.

Yes, the answer is correct.

Score: 1

Accepted Answers:

Textbooks provide accumulated knowledge, while research papers explore new frontiers.

3) What is an important step in the early stages of research that involves trial and error?

1 point

- ☒ Conducting a literature survey to identify interesting topics.

● **Quiz: Week 1:
Assignment 1
(assessment?
name=134)**

● Week 1
Feedback
Form:
Research
Methodology
(unit?
unit=16&lesso
n=21)

**Week 1:
Overview of
Research ()**

**Week 2:
Literature
Survey,
Experimental
skills ()**

**Week 3 -
Data
analysis and
Modelling
skills ()**

**Week 4:
Technical
presentation
and writing ()**

**Week 5:
Creativity in
research ()**

**Week 6-
Intellectual
property ()**

**Week 7-
Design of
Experiments
()**

**Week 8-
Department
specific
discussions
()**

- ☐ Selecting a favourite monument or sightseeing place.
- ☐ Spending more time exploring and understanding a chosen subject.
- ☐ Contributing to the chosen area through research.

Yes, the answer is correct.

Score: 1

Accepted Answers:

Conducting a literature survey to identify interesting topics.

4) What is the relationship between incremental research and path-breaking research? **1 point**

- ☒ Incremental research leads to path-breaking research.
- ☐ Path-breaking research precedes incremental research.
- ☐ Incremental research and path-breaking research are unrelated.
- ☐ Path-breaking research is a structured process in contrast to incremental research.

Yes, the answer is correct.

Score: 1

Accepted Answers:

Incremental research leads to path-breaking research.

5) What are the important factors to consider when selecting a research area and guide/advisor? **1 point**

- ☒ The appeal and interest in the area of study and the impact it has on the scientific community.
- ☐ The availability of independent research opportunities.
- ☐ The proximity of the research lab to the scientific community.
- ☐ The recommendation of peers or colleagues.

Yes, the answer is correct.

Score: 1

Accepted Answers:

The appeal and interest in the area of study and the impact it has on the scientific community.

6) What is the role of an advisor in research? **1 point**

- ☐ To provide day-to-day instructions and guidance on what to do.
- ☒ To steer the direction of the research when the student gets lost.
- ☐ To execute a calendar of instructions and oversee the student's progress.
- ☐ To interpret and put the results of the research in the wrong perspective.

Yes, the answer is correct.

Score: 1

Accepted Answers:

To steer the direction of the research when the student gets lost.

7) What are the important characteristics for students to fulfil their role as researchers? **1 point**

- ☐ Super intelligence and adventurous mindset.
- ☐ No work ethic and perseverance.
- ☒ Spark of interest and spirit of learning.
- ☐ Collaborative and communicative abilities.

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Yes, the answer is correct.

Score: 1

Accepted Answers:

Spark of interest and spirit of learning.

8) What attitude should a student maintain when pursuing research?

1 point

- ☐ A sense of urgency and impatience to achieve immediate results.
- ☒ A steady and incremental approach while keeping the long-term goal in mind.
- ☐ An obsessive-compulsive disorder to overcome any obstacles.
- ☐ A focus on day-to-day tasks without considering the long-term objective.

Yes, the answer is correct.

Score: 1

Accepted Answers:

A steady and incremental approach while keeping the long-term goal in mind.

9) What are some motivations for conducting research?

1 point

- ☐ Improving efficiency and reducing manual work.
- ☐ Promoting betterment of society and the world.
- ☐ Experiencing joy, passion, and appreciation for scientific endeavours.
- ☒ All of the above.

Yes, the answer is correct.

Score: 1

Accepted Answers:

All of the above.

10) Why is it important to have a clear understanding of the purpose of research?

1 point

- ☐ It helps determine the degree of art involved in the research.
- ☐ It enables individuals to answer the question of why they are conducting research.
- ☐ It ensures survival and longevity in the field of research.
- ☒ All of the above.

Yes, the answer is correct.

Score: 1

Accepted Answers:

All of the above.

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Research ()

Week 2:
Literature
Survey,
Experimental
skills ()

● Overview of
Literature
Survey (unit?)

Week 2: Assignment 2

The due date for submitting this assignment has passed.

Due on 2023-09-06, 23:59 IST.

Assignment submitted on 2023-09-03, 18:53 IST

Questions 1 to 5 are multiple choice type. Read the questions carefully and select a correct answer from the choices. Question 6 to 10 are True or False type.

- 1) Which of the following is a recommended criterion to pick a reference article for inclusion in a publication? **1 point**

- ☐ The article is authored by likely reviewers
☒ The article is a prior work directly relating to the topic
☐ The article is authored by someone well known in that topic
☐ The article appeared in a well known journal

Yes, the answer is correct.
Score: 1

Accepted Answers:

The article is a prior work directly relating to the topic

- 2) Which of the following indices is considered as a measure of the impact of a particular article in its area of specialization? **1 point**

- ☐ Number of likes
☐ Number of views
☐ Number of downloads
☒ Number of articles referring to it

Yes, the answer is correct.
Score: 1

Accepted Answers:

Number of articles referring to it

unit=24&less
n=25)

● Literature
Survey using
Web of Science
(unit?
unit=24&less
n=26)

● Literature
Survey using
Scopus (unit?
unit=24&less
n=27)

● Writing Up
(unit?
unit=24&less
n=28)

● Tutorial on
using BibTeX
with LaTeX to
add references
to a document
(unit?
unit=24&less
n=29)

● Tutorial on
using
Microsoft Word
with
Bibliographic
Sources (unit?
unit=24&less
n=30)

● Tutorial on
using
Microsoft Word
with endnote
entries (unit?
unit=24&less
n=31)

● Demo video
on how to
submit the
assignment
summary
writing (unit?
unit=24&less
n=32)

● Demo video
for submitting
and peer
reviewing

3) Which of the following bibliographic details is necessary to retrieve all other details of a digitally published article? **1 point**

- ☐ ISSN
☐ ISBN
☒ DOI
☐ URL

Yes, the answer is correct.

Score: 1

Accepted Answers:

DOI

4) Consider that you have collected the following resources towards your research: (1) A book published recently without an ISBN (2) An article in an archival journal that you just read (3) A copy of proceedings of a conference with an ISSN number (4) A journal article recently submitted, archived on arXiv.org, yet to be accepted. Which of the following can be considered as valid references for inclusion in a publication? **1 point**

- ☐ All four of them
☐ Only 1, 2 and 3
☒ Only 2, 3 and 4
☐ Only 1, 3 and 4

Yes, the answer is correct.

Score: 1

Accepted Answers:

Only 2, 3 and 4

5) You have read a white paper published by an organization in their website and would like to refer to it in a journal article you are writing. Which of the following describes an acceptable way to refer? **1 point**

- ☐ Author, title of the article, organization
☒ Author, title of the article, website containing the article, last accessed date
☐ Title of the article, organization, website
☐ Author, title of the article, website of the organization

Yes, the answer is correct.

Score: 1

Accepted Answers:

Author, title of the article, website containing the article, last accessed date

6) Gloves of any kind are safe for handling hot samples. **1 point**

- ☐ True
☒ False

Yes, the answer is correct.

Score: 1

Accepted Answers:

False

7) In a tube furnace, with flowing gas, different locations can have different temperatures. **1 point**

assignment 1_
summary
writing (unit?
unit=24&lesso
n=33)

Experimental
skills (unit?
unit=24&lesso
n=34)

Literature
Survey from
Home (unit?
unit=24&lesso
n=35)

**Quiz: Week 2:
Assignment 2
(assessment?
name=135)**

Week 2
Feedback
Form:
Research
Methodology
(unit?
unit=24&lesso
n=36)

**Week 3 -
Data
analysis and
Modelling
skills ()**

**Week 4:
Technical
presentation
and writing ()**

**Week 5:
Creativity in
research ()**

**Week 6-
Intellectual
property ()**

**Week 7-
Design of
Experiments
()**

☒ True
☐ False

Yes, the answer is correct.
Score: 1

Accepted Answers:
True

8) Any glass covering the eyes, can be considered as providing eye safety **1 point**

☐ True
☒ False

Yes, the answer is correct.
Score: 1

Accepted Answers:
False

9) In a well designed experiment, there will be no errors, and it will be possible to reproduce each data point value without error, indefinitely. **1 point**

☐ True
☒ False

Yes, the answer is correct.
Score: 1

Accepted Answers:
False

10) Only hot objects such as a furnace, are dangerous. Cold items such as liquid nitrogen are not dangerous **1 point**

☐ True
☒ False

Yes, the answer is correct.
Score: 1

Accepted Answers:
False

**Week 8-
Department
specific
discussions
()**

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Data
analysis and

Week 3: Assignment 3

The due date for submitting this assignment has passed.

Due on 2023-09-13, 23:59 IST.

Assignment submitted on 2023-09-13, 22:02 IST

The assignment for 3rd week is here. The assignment is multiple choice (MCQ) type. There may be more than one answer for few/all of the questions. You need to select all the correct answers.

1) Which of the following statements is true?

1 point

- ☐ All processes are purely stochastic.
- ☒ The outcome of a random process can be sometimes predicted accurately.
- ☒ Processes can have a mix of both deterministic and stochastic effects.
- ☐ Procedures and methods for data analysis are identical for deterministic and stochastic processes

No, the answer is incorrect.

Score: 0

Accepted Answers:

Processes can have a mix of both deterministic and stochastic effects.

2) What is / are the feature(s) of a pure deterministic process?

1 point

- ☒ It is always periodic
- ☒ Errors in prediction are usually small
- ☐ Repeated experiments under controlled and identical conditions produce same series
- ☒ At any instant in time, there exists only one possible known outcome

No, the answer is incorrect.

Score: 0

Accepted Answers:

Repeated experiments under controlled and identical conditions produce same series

At any instant in time, there exists only one possible known outcome

Modelling skills ()

Data analysis Part 1 (unit? unit=37&lesson=38)

Data analysis Part 2 (unit? unit=37&lesson=39)

Modelling skills Part 1 (unit? unit=37&lesson=40)

Modelling skills Part 2 (unit? unit=37&lesson=41)

Text file of data analysis (unit? unit=37&lesson=42)

Safety in laboratory (unit? unit=37&lesson=43)

Quiz: Week 3: Assignment 3 (assessment? name=136)

Week 3 Feedback Form: Research Methodology (unit? unit=37&lesson=44)

Week 4: Technical presentation and writing ()

Week 5: Creativity in

3) Identify the correct statement(s) among the following.

1 point

- ☐ For a deterministic process, the ensemble and sample averages are identical.
- ☒ A statistic and estimator are both mathematical functions of the observed data.
- ☐ An estimate can have a large bias but low variability and vice versa.
- ☒ Variability is a measure of how the estimate varies with sample size.

No, the answer is incorrect.

Score: 0

Accepted Answers:

A statistic and estimator are both mathematical functions of the observed data.

An estimate can have a large bias but low variability and vice versa.

4) Prasiddha has two data sets D1 and D2, each containing records of two variables X and Y of a process, but from two different experimental conditions. Which of the following is NOT necessarily true? **1 point**

- ☐ The sample correlation between X and Y can be identical for D1 and D2.
- ☐ A model built from D1 should predict well on D2 and vice versa.
- ☐ The best model for the process is the average of two models built from D1 and D2.
- ☒ If D1 and D2 have the same signal-to-noise ratio and sample size, we can expect identical models.

Partially Correct.

Score: 0.34

Accepted Answers:

A model built from D1 should predict well on D2 and vice versa.

The best model for the process is the average of two models built from D1 and D2.

If D1 and D2 have the same signal-to-noise ratio and sample size, we can expect identical models.

5) Which of the following is true w.r.t. empirical (data-driven) and first-principles models? **1 point**

- ☐ Empirical models have very good extrapolation capabilities.
- ☐ First-principles models are not necessarily suited for handling uncertainties in processes.
- ☐ It is easy to obtain physical insights (into the process) from empirical models.
- ☒ Data-driven, i.e., empirical models, can be of much simpler structure than their first-principles counterparts.

Partially Correct.

Score: 0.5

Accepted Answers:

First-principles models are not necessarily suited for handling uncertainties in processes.

Data-driven, i.e., empirical models, can be of much simpler structure than their first-principles counterparts.

6) Aprameya collects, for a given process, two data sets D1 and D2 of same sample sizes, but with two different signal-to-noise ratios of 40 and 10, respectively. **1 point**

- ☒ Parameter estimates from D1 are more precise than those obtained from D2.
- ☒ Model built from one-fourth of data in D1 is as good as the model built from D2.

research ()

Week 6-
Intellectual
property ()Week 7-
Design of
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()Week 8-
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- ☒ The signal in data set D2 is 2 times weaker in amplitude than that in D1.
- ☐ Estimates obtained from D1 will have much lesser bias than those from D2.

No, the answer is incorrect.

Score: 0

Accepted Answers:

Parameter estimates from D1 are more precise than those obtained from D2.

7) Identify, among the following models, the linear dynamic model(s) for a generic (discrete-time) process with input $u[k]$ and output $y[k]$: **1 point**

- ☒ $y[k] = 0.8u[k - 1] + u[k - 10]$
- ☐ $y[k] = 2.5u^2[k - 1] + 3$
- ☐ $y[k] + 0.9y[k - 1] = 2u[k]$
- ☒ $y[k] = u[k - 1] - u[k - 2]$

Partially Correct.

Score: 0.67

Accepted Answers:

$y[k] = 0.8u[k - 1] + u[k - 10]$
 $y[k] + 0.9y[k - 1] = 2u[k]$
 $y[k] = u[k - 1] - u[k - 2]$

8) Which of the following is true w.r.t. overfitting in data-driven modelling? **1 point**

- ☐ Overfitting implies using more observations than required.
- ☐ In an overfitted model, the “extra” parameter estimates are always zero-valued.
- ☒ Overfit models generally perform poorly on fresh data sets.
- ☒ Overfitting occurs because the model is forced to explain highly-local noise characteristics.

Yes, the answer is correct.

Score: 1

Accepted Answers:

Overfit models generally perform poorly on fresh data sets.

Overfitting occurs because the model is forced to explain highly-local noise characteristics.

9) The first-order linearized form of the function t^3 , around the steady state value t_0 is: **1 point**

- ☐ $3t_0^2 t$
- ☐ $3t_0^2 t + t$
- ☐ $3t_0^2 t - 2t_0^3$
- ☒ None of the above

No, the answer is incorrect.

Score: 0

Accepted Answers:

$3t_0^2 t - 2t_0^3$

10) A function $f(t)$ is given to be $f(t) = at^{1.5} + b$, where $t \in \mathbb{R}$ and a, b are real-valued **1 point** parameters (independent of time t). Then the function is (select all correct answer(s)):

- ☒ Linear in parameters a and b .
- ☐ Linear in $t^{1.5}$ but non-linear in t .
- ☐ Non-linear in $at^{1.5}$ for a fixed b .
- ☒ Linear in t over the interval $0 \leq t \leq 1$.

No, the answer is incorrect.

Score: 0

Accepted Answers:

Linear in parameters a and b .

Non-linear in $at^{1.5}$ for a fixed b .

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Week 4: Assignment 4

The due date for submitting this assignment has passed.

Due on 2023-09-20, 23:59 IST.

Assignment submitted on 2023-09-13, 22:10 IST

Assignment 4 has all "True or False" type questions.

1) The title of a paper is 'Impact of mobility on velocity'. This title identifies the area of research and what is unique about it. **1 point**

- ☐ True
☒ False

Yes, the answer is correct.

Score: 1

Accepted Answers:

False

2) "Low tyre pressure leads to a softer ride and greater wear and tear of the tyre. This is desirable from the perspective of the tyre company." Use of the word 'this' in the previous sentence is ambiguous. **1 point**

- ☒ True
☐ False

Yes, the answer is correct.

Score: 1

Accepted Answers:

True

3) In images, high magnification leads to high resolution. **1 point**

- ☐ True

Modelling skills ()

Week 4: Technical presentation and writing ()

● How to make Technical presentation (unit? unit=50&lesson=51)

● Technical Writing (unit? unit=50&lesson=52)

○ Week 4 Feedback Form: Introduction to Research (unit? unit=50&lesson=53)

● Quiz: Week 4: Assignment 4 (assessment? name=137)

Week 5: Creativity in research ()

Week 6- Intellectual property ()

Week 7- Design of Experiments ()

Week 8- Department specific discussions ()

Text Transcripts ()

☒ False

Yes, the answer is correct.

Score: 1

Accepted Answers:

False

4) Abstract is aimed at an audience that has not yet read the paper.

1 point

☒ True

☐ False

Yes, the answer is correct.

Score: 1

Accepted Answers:

True

5) Data in tables must always indicate as many digits as obtained through the calculator

1 point

☐ True

☒ False

Yes, the answer is correct.

Score: 1

Accepted Answers:

False

6) A reasonable pace for presentation is 5 slides a minute

1 point

☐ True

☒ False

Yes, the answer is correct.

Score: 1

Accepted Answers:

False

7) In a journal paper, the image of a satellite must indicate the solar panels of the satellite to confirm that the image represents a satellite in orbit.

1 point

☐ True

☒ False

Yes, the answer is correct.

Score: 1

Accepted Answers:

False

8) The length of sentences should be such that by the time the readers reach the end of the sentence, they should not have forgotten the beginning. **1 point**

☒ True

☐ False

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Yes, the answer is correct.

Score: 1

Accepted Answers:

True

9) Once you know the result, it is acceptable to state it using "It is obvious that..."

1 point

☐ True

☒ False

Yes, the answer is correct.

Score: 1

Accepted Answers:

False

10) One must give away the best result of the work right at the beginning of the document itself.

1 point

☐ True

☒ False

No, the answer is incorrect.

Score: 0

Accepted Answers:

True

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Week 5: Assignment 5

The due date for submitting this assignment has passed.

Due on 2023-09-27, 23:59 IST.

Assignment submitted on 2023-09-21, 11:03 IST

This is the fifth assignment. This assignment is based on lectures on Creativity.

1) A typical undergraduate degree makes you

1 point

- ☐ A specialist
- ☐ As focused as a PhD candidate
- ☒ A person with limited knowledge on a large number of topics
- ☐ A person successful in science quiz

Yes, the answer is correct.

Score: 1

Accepted Answers:

A person with limited knowledge on a large number of topics

2) Creative people typically

1 point

- ☐ Follow rules
- ☐ Accept boundaries
- ☒ Disagree with conventional thinking
- ☐ Write story books

Yes, the answer is correct.

Score: 1

Accepted Answers:

Disagree with conventional thinking

3) A successful researcher is one whose work recognized as important by

1 point

Modelling skills ()

Week 4: Technical presentation and writing ()

Week 5: Creativity in research ()

☒ Creativity in Research Part 1 (unit? unit=54&lesson=55)

☐ Creativity in research Part 2 (unit? unit=54&lesson=56)

☐ Creativity in research Part 3 (unit? unit=54&lesson=57)

☐ Ethics in Research (unit? unit=54&lesson=58)

☒ Quiz: Week 5: Assignment 5 (assessment? name=138)

☐ Week 5 Feedback Form: Introduction to Research (unit? unit=54&lesson=59)

Week 6- Intellectual property ()

Week 7- Design of

- ☐ His school teacher
- ☐ General public
- ☒ International peer group
- ☐ College students

Yes, the answer is correct.
Score: 1

Accepted Answers:
International peer group

4) To be a successful researcher one has to typically

1 point

- ☐ Know all techniques in engineering
- ☒ Know all appropriate techniques in a field
- ☐ Be strong in computing skills
- ☐ Be fluent in verbal skills

Yes, the answer is correct.
Score: 1

Accepted Answers:
Know all appropriate techniques in a field

5) Some of the most successful people have put in on average

1 point

- ☐ 10 hours of hard work
- ☐ 100 hours of hard work
- ☐ 1,000 hours of hard work
- ☒ 10,000 hours of hard work

Yes, the answer is correct.
Score: 1

Accepted Answers:
10,000 hours of hard work

6) Analysing usual situations in unusual ways is

1 point

- ☐ Productivity
- ☒ Creativity
- ☐ Repeatability
- ☐ Negativity

Yes, the answer is correct.
Score: 1

Accepted Answers:
Creativity

7) The most likely common factor between a large number of successful people is:

1 point

- ☒ Hard work
- ☐ Location
- ☐ Facilities
- ☐ Money

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Yes, the answer is correct.

Score: 1

Accepted Answers:

Hard work

8) Society associates very high importance to

1 point

- ☐ Diligence
- ☐ Impatience
- ☐ Failures
- ☒ Success

Yes, the answer is correct.

Score: 1

Accepted Answers:

Success

9) One form of intrinsic motivation is

1 point

- ☐ Money
- ☐ Fame
- ☐ Awards
- ☒ Satisfaction of having solved the problem

Yes, the answer is correct.

Score: 1

Accepted Answers:

Satisfaction of having solved the problem

10) A conducive environment:

1 point

- ☐ Is necessary for Great work
- ☒ Can help, but is not necessary for great work
- ☐ Does not result in great work
- ☐ Always makes people lazy

Yes, the answer is correct.

Score: 1

Accepted Answers:

Can help, but is not necessary for great work

X

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Course outline

How does an
NPTEL
online
course
work? ()

Week 1:
Group
Discussion
on Research
()

Week 1:
Overview of
Research ()

Week 2:
Literature
Survey,
Experimental
skills ()

Week 3 -
Data
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Week 6: Assignment 6

The due date for submitting this assignment has passed.

Due on 2023-10-04, 23:59 IST.

Assignment submitted on 2023-10-03, 10:49 IST

Choose the correct answer from the options.

1) Which of the following is NOT a type of Intellectual Property Right?

1 point

- ☐ Patents
- ☐ Trade Marks
- ☒ Torts
- ☐ Copyright

Yes, the answer is correct.

Score: 1

Accepted Answers:

Torts

2) What is the duration of copyright protection James can seek for one of his non-fiction book in India?

1 point

- ☐ Non-fiction works cannot be protected by copyright
- ☐ Only during the lifetime of James
- ☒ Lifetime of James plus a period of 60 years after his death
- ☐ James or his legal heirs can seek copyright protection in his work for perpetuity

Yes, the answer is correct.

Score: 1

Accepted Answers:

Lifetime of James plus a period of 60 years after his death

Modelling skills ()

Week 4: Technical presentation and writing ()

Week 5: Creativity in research ()

Week 6- Intellectual property ()

- ☐ Part 1 (unit? unit=60&lesson=61)
- ☐ Part 2 (unit? unit=60&lesson=62)
- ☐ Week 6 Feedback Form: Introduction to Research (unit? unit=60&lesson=63)

Quiz: Week 6: Assignment 6 (assessment? name=139)

Week 7- Design of Experiments ()

Week 8- Department specific discussions ()

Text Transcripts ()

Books ()

3) A street vendor in Adyar is selling fake 'Nike' shoes. Under which area of Intellectual **1 point** Property would Nike likely seek a remedy?

- ☐ Copyright
- ☒ Trade Marks
- ☐ Patents
- ☐ Trade Secrets

Yes, the answer is correct.

Score: 1

Accepted Answers:

Trade Marks

4) Jon Snow has designed a uniquely shaped walker for his brother Brandon Stark, **1 point** which can be collapsed and, with the aid of two levers, also used as a chair. Jon plans to commercially produce his design under the name of Winterfell Stroller. Which of the following types of intellectual property would most likely apply to Jon's creation?

- ☐ Patent; copyright; trademark
- ☐ Trademark; industrial design; trade secret
- ☐ Copyright; trademark; industrial design
- ☒ Patent; trademark; industrial design

Yes, the answer is correct.

Score: 1

Accepted Answers:

Patent; trademark; industrial design

5) Which of the following is NOT a remedy for infringement of Intellectual Property? **1 point**

- ☒ Specific Performance
- ☐ Accounts for Profits
- ☐ Injunction
- ☐ Damages

Yes, the answer is correct.

Score: 1

Accepted Answers:

Specific Performance

6) Which of following types of Intellectual Property need not be registered to seek **1 point** protection?

- ☐ Patents
- ☐ Trade Marks
- ☒ Copyright
- ☐ Geographical Indication

Yes, the answer is correct.

Score: 1

Accepted Answers:

Copyright

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7) A patent can be granted if an invention is—

1 point

- ☐ Novel
- ☐ Non-obvious
- ☐ Capable of Industrial Applicability
- ☒ All of the above

Yes, the answer is correct.

Score: 1

Accepted Answers:

All of the above

8) Which of the following statements is true with respect to Industrial Designs?

1 point

- ☐ It protects the ornamental and aesthetic aspect of an article
- ☐ In India, the maximum term of protection is 15 years
- ☐ Industrial Design protects both three dimensional and two-dimensional features of a product
- ☒ All of the above are true

Yes, the answer is correct.

Score: 1

Accepted Answers:

All of the above are true

9) In India, a computer programme/software on its own can be protected by which of the following?

1 point

- ☐ Trade Marks
- ☒ Copyright
- ☐ Patents
- ☐ No IP protection is granted

Yes, the answer is correct.

Score: 1

Accepted Answers:

Copyright

10) Sheldon has been granted a patent for his gyroscope idea. Having a patent, he is entitled to which of these rights?

1 point

- ☐ Right of excludability
- ☐ Right of commercial exploitation
- ☐ Right to file a suit in case of infringement
- ☒ All of the above

Yes, the answer is correct.

Score: 1

Accepted Answers:

All of the above


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Week 7: Assignment 7

The due date for submitting this assignment has passed.

Due on 2023-10-11, 23:59 IST.

Assignment submitted on 2023-10-03, 10:54 IST

1) When conducting experiments in the lab you should have control over **1 point**

- ☐ Decided experimental settings
- ☐ instrument precision
- ☐ Instrument calibration
- ☒ All of the above

Yes, the answer is correct.

Score: 1

Accepted Answers:

All of the above

2) Even well planned and conducted experiments performed repeatedly fail **1 point**
to usually give identical responses because of

- ☐ instrument fault
- ☐ inattentiveness of experimenter
- ☒ random effects on which the experimenter has no control of
- ☐ none of the above

Yes, the answer is correct.

Score: 1

Accepted Answers:

random effects on which the experimenter has no control of

3) When you do experiments repeatedly you should analyse **1 point**

- ☐ the average value of the responses only

Modelling skills ()

Week 4: Technical presentation and writing ()

Week 5: Creativity in research ()

Week 6- Intellectual property ()

Week 7- Design of Experiments ()

☒ DOE Part 1 (unit? unit=64&lesson=65)

☐ DOE part 2 (unit? unit=64&lesson=66)

☐ DOE part 3 (unit? unit=64&lesson=67)

☐ DOE part 4 (unit? unit=64&lesson=68)

☐ DOE part 5 (unit? unit=64&lesson=69)

☐ Week 7 Feedback Form: Introduction to Research (unit? unit=64&lesson=70)

☒ Quiz: Week 7: Assignment 7

- ☐ the standard deviation of the responses only
- ☐ neither the average or standard deviation
- ☒ both mean and standard deviation

Yes, the answer is correct.

Score: 1

Accepted Answers:

both mean and standard deviation

4) Which of the following have the same units as the data collected for an analysis **1 point**

- ☐ Mean and variance
- ☒ mean and standard deviation
- ☐ mean only
- ☐ variance only

Yes, the answer is correct.

Score: 1

Accepted Answers:

mean and standard deviation

5) In a normal distribution with parameter μ and σ^2 , the **1 point**

- ☐ mean is always zero
- ☐ mean is always positive (>0)
- ☒ mean is same as μ
- ☐ mean is same as σ^2

Yes, the answer is correct.

Score: 1

Accepted Answers:

mean is same as μ

6) ONE of the following is zero, where \bar{x} is the sample mean and n is the sample size **1 point**

- ☒ $\sum_{i=1}^n (x_i - \bar{x}) = 0$
- ☐ $\sum_{i=1}^n (x_i - \bar{x})^2 = 0$
- ☐ $\sum_{i=1}^n |(x_i - \bar{x})| = 0$
- ☐ $\sum_{i=1}^n (x_i - \bar{x})^{0.5} = 0$

Yes, the answer is correct.

Score: 1

Accepted Answers:

$\sum_{i=1}^n (x_i - \bar{x}) = 0$

7) In a normal probability distribution $\int_{-\infty}^{0.5} f(x)dx = \int_{0.5}^{\infty} f(x)dx$, then **1 point**

☒

(assessment?
name=140)

Week 8-
Department
specific
discussions
()

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$$\int_{-\infty}^{\infty} f(x)dx = 1$$

- ☐ the probability distribution is symmetric about 0.5
- ☐ the mean of the probability distribution is 0.5
- ☐ All of the above

No, the answer is incorrect.

Score: 0

Accepted Answers:

All of the above

Data for problems 8, 9 and 10: Sample data of ages of students studying in class VI is given by 8, 9, 9, 9, 10, 12, 11, 10

8) Mean of the above data set is

1 point

- ☐ 8
- ☐ 9
- ☒ 9.75
- ☐ 7.82

Yes, the answer is correct.

Score: 1

Accepted Answers:

9.75

9) Variance of the above data set is

1 point

- ☐ 9.75
- ☐ 7.82
- ☐ 1.282
- ☒ 1.643

Yes, the answer is correct.

Score: 1

Accepted Answers:

1.643

10) Median of the above data set is

1 point

- ☐ 8.5
- ☐ 9
- ☒ 9.5
- ☐ 10

Yes, the answer is correct.

Score: 1

Accepted Answers:

9.5

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Week 8: Assignment 8

The due date for submitting this assignment has passed.

Due on 2023-10-18, 23:59 IST.

Assignment submitted on 2023-10-09, 20:25 IST

1) What is one of the main differences between a classroom environment and a research program? **1 point**

- ☐ In a classroom environment, problems are well defined and involve multiple variables, while in research, problems have fewer given variables and require the scholar to determine the others.
- ☐ In a classroom environment, problems involve only one variable, while in research, problems involve multiple variables and require the scholar to find their relationships.
- ☐ In a classroom environment, problems are open-ended and involve multiple variables, while in research, problems have well-defined solutions and involve only one variable.
- ☒ In a classroom environment, problems are well defined and involve only one variable, while in research, problems have multiple variables and require the scholar to find their relationships.

Yes, the answer is correct.

Score: 1

Accepted Answers:

In a classroom environment, problems are well defined and involve only one variable, while in research, problems have multiple variables and require the scholar to find their relationships.

2) What is the recommended approach for students to undertake research? **1 point**

- ☒ Students should have an open mind and be prepared to work on interdisciplinary problems, as many real-world problems do not fit within narrow vertical silos of a single field.
- ☐ Students should focus only on deepening their knowledge within their specific undergraduate discipline, as it will be sufficient to solve most research problems.
- ☐ Students should not prioritize enjoying the research journey.

Modelling skills ()**Week 4: Technical presentation and writing ()****Week 5: Creativity in research ()****Week 6- Intellectual property ()****Week 7- Design of Experiments ()****Week 8- Department specific discussions ()**

☐ Research in Applied Mechanics (unit? unit=71&lesson=72)

☐ Research in Chemical Engineering (unit? unit=71&lesson=73)

☐ Research in Civil Engineering (unit? unit=71&lesson=74)

☐ Research in Computer Science & Engineering (unit? unit=71&lesson=75)

☐ Students should focus only on well-defined fields to get publications.

Yes, the answer is correct.

Score: 1

Accepted Answers:

Students should have an open mind and be prepared to work on interdisciplinary problems, as many real-world problems do not fit within narrow vertical silos of a single field.

3) Which of the following is NOT a characteristic of a successful researcher at the end of their PhD program? **1 point**

- ☐ Clear understanding of their work and ability to explain it to others.
- ☐ Identification of the limitations and boundaries of their research.
- ☐ Setting goals for future research based on their current work.
- ☒ Dependence on others to carry out research independently.

Yes, the answer is correct.

Score: 1

Accepted Answers:

Dependence on others to carry out research independently.

4) What is the purpose of research in education? **1 point**

- ☐ To diminish social status.
- ☐ To reduce employment opportunities.
- ☐ To suppress personal development.
- ☒ To contribute to becoming a respected educational professional.

Yes, the answer is correct.

Score: 1

Accepted Answers:

To contribute to becoming a respected educational professional.

5) Which of the following are primary objectives of research in modern society? **1 point**

- ☐ Acquiring new knowledge.
- ☐ Staying updated with advancements in knowledge.
- ☐ Conducting systematic examination and critical analysis of investigations and sources.
- ☒ All of the above

Yes, the answer is correct.

Score: 1

Accepted Answers:

All of the above

6) Which process is typically not required in experimental research? **1 point**

- ☐ Controlling variables.
- ☐ Making observations.
- ☒ Collecting references.
- ☐ Manipulating results.

No, the answer is incorrect.

☐ Research in Engineering Design (unit? unit=71&lesson=76)

☐ Research in Humanities & Social Sciences (unit? unit=71&lesson=77)

☐ Research in Mechanical Engineering (unit? unit=71&lesson=78)

☐ Research in Metallurgical & Materials Engineering (unit? unit=71&lesson=79)

☐ Research in Ocean Engineering (unit? unit=71&lesson=80)

☐ Research in Management Studies (unit? unit=71&lesson=81)

☐ Research in Aerospace Engineering (unit? unit=71&lesson=82)

☐ Research in Biotechnology (unit? unit=71&lesson=83)

☐ Research in Chemistry (unit?)

Score: 0

Accepted Answers:

Manipulating results.

7) What is the rationale behind discouraging manipulation in research?

1 point

- ☐ It distorts the validity and reliability of the findings.
- ☐ It undermines the integrity and credibility of the researcher.
- ☐ It hampers the progress and advancement of knowledge.
- ☒ All of the above.

Yes, the answer is correct.

Score: 1

Accepted Answers:

All of the above.

8) Which of the following options best defines research?

1 point

- ☐ Repeating a search process multiple times.
- ☐ Discovering solutions to various problems.
- ☒ Conducting systematic scientific investigations to uncover the truth about a specific problem.
- ☐ None of the above.

Yes, the answer is correct.

Score: 1

Accepted Answers:

Conducting systematic scientific investigations to uncover the truth about a specific problem.

9) Which of the following is a primary requirement when starting research?

1 point

- ☐ Creating a research design
- ☒ Establishing a research question
- ☐ Determining the data analysis procedure
- ☐ Writing thesis

Yes, the answer is correct.

Score: 1

Accepted Answers:

Establishing a research question

10) What is the primary objective of interdisciplinary research?

1 point

- ☐ To complicate research problems.
- ☒ To incorporate a comprehensive methodology by merging two or more fields.
- ☐ To provide an introduction to traditional research methodology.
- ☐ To diminish the focus on a single subject within the research domain.

Yes, the answer is correct.

Score: 1

Accepted Answers:

To incorporate a comprehensive methodology by merging two or more fields.

unit=71&less
n=84)

☐ Research in
Electrical
Engineering
(unit?
unit=71&less
n=85)

☐ Research in
Mathematics
(unit?
unit=71&less
n=86)

☐ Research in
Physics (unit?
unit=71&less
n=87)

☐ Discussion
with Research
Scholars (unit?
unit=71&less
n=88)

☐ Week 8
Feedback
Form:
Introduction to
Research
(unit?
unit=71&less
n=89)

☒ **Quiz: Week 8:
Assignment 8
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name=141)**

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