# BIBLIOGRAPHY

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# APPENDICES

## PERCEIVED SCHOOL CLIMATE SCALE (PSCS)

**Please fill in the following information:** **Date** ☐☐☐☐☐☐☐☐

**Name : ……** **Date of birth** ☐☐☐☐☐☐☐☐

**Sex:** **Male** ☐ **Female** ☐ **Area:** **Urban** ☐ **Rural** ☐

**Type of family:** **Nuclear** ☐ **Joint** ☐

**Type of Institution: Govt.** ☐ **Private** ☐

**Name of the School : …….**

**Instructions:**

Here are a few statements, dealing with perceived school climate scale. Each statement has five alternatives. Read the statements carefully and decide whether you **Strongly Agree (SA), Agree (A), Undecided (U), Disagree (D), or Strongly Disagree (SD)** with the statements using the following 5-point scale. Kindly make sure that you have dealt with all statements. Please tick on the appropriate option as they apply to yourself. There is no right and wrong option. Your information will be kept confidential.

*** marked items are negative.**

| Sr. No. | Statements | | | | | | SCORE |
|---|---|---|---|---|---|---|---|
| | | SA | A | U | D | SD | |
| 1 | All pupils receive the same punishment for disobeying the rules. | | | | | | |
| 2 | I feel secure outside of school, including on the bus, when walking to and from school, and other places. | | | | | | |
| 3 | My daily life difficulties are not known by my teachers.* | | | | | | |
| 4 | My teachers inform me when I perform well. | | | | | | |
| 5 | My school attempts to involve my family in school events. | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 6 | A teacher or other responsible adult at my school is aware of my absence. | | | | | | |
| 7 | I've been called names, teased, and made fun of numerous times at my school.* | | | | | | |
| 8 | Teachers encourage me to go beyond what I think I'm capable of. | | | | | | |
| 9 | My teachers show concern for me. | | | | | | |
| 10 | Students at this institution can relatively easily get away with disobeying the rules.* | | | | | | |
| 11 | At my school, there have been numerous instances of pupils injuring other students (by being pushed, slapped, hit, etc.). * | | | | | | |
| 12 | The staff and teachers seem to be very interested about my academic progress. | | | | | | |
| 13 | The adults in my school are fair in their enforcement of the rules by all students. | | | | | | |
| 14 | I feel secure throughout the entire campus, including the restrooms, cafeteria, corridors, and classes. | | | | | | |
| 15 | The school's teachers and students get along well. | | | | | | |
| 16 | The school's policies are unfair* | | | | | | |
| 17 | There aren't many students at my school that make fun of other students. | | | | | | |
| 18 | At my school, adults enjoy interacting with pupils and getting to know them. | | | | | | |
| 19 | I'm not satisfied with my performance at school.* | | | | | | |
| 20 | Most of the pupils at my school get along well with one another. | | | | | | |
| 21 | My teachers push me to experiment with original concepts. | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 22 | Making fun of others or using derogatory language is prohibited at my school. | | | | | | |
| 23 | Communication with the teachers at this school is challenging.* | | | | | | |
| 24 | My teachers give me a variety of opportunities to demonstrate my knowledge (such as projects, tests, assignments, etc.). | | | | | | |
| 25 | There are no policies at my school prohibiting harming other people, such as hitting, shoving, tripping, etc.* | | | | | | |
| 26 | My teachers educate me how to learn from my mistakes. | | | | | | |
| 27 | At this school, students are only disciplined when they deserve it. | | | | | | |
| 28 | The students at this school don't like each other.* | | | | | | |
| 29 | I have repeatedly witnessed students at my school being called names, harassed, or otherwise mocked.* | | | | | | |
| 30 | My teacher doesn't believe I'll perform well in school.* | | | | | | |
| 31 | My teachers give me individualised attention when I ask for it. | | | | | | |
| 32 | Adults at my school will intervene when they observe students inflicting harm on one another (by pushing, slapping, beating one another up, etc.). | | | | | | |
| 33 | I believe this school is the best fit for me. | | | | | | |
| 34 | If I need help with my homework, I have friends who can help. | | | | | | |
| 35 | I've been hit, shoved, slapped, etc. in school more than once.* | | | | | | |
| 36 | At my school, I feel accepted. | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 37 | Students of all races and ethnicities are treated equally. | | | | | | |
| 38 | My school's teacher doesn't help us pupils with our problems.* | | | | | | |
| 39 | Students at my school will work to stop peers from making fun of others. | | | | | | |
| 40 | My teacher gives me confidence in myself. | | | | | | |
| 41 | My teacher doesn't let me know how I'm doing in class.* | | | | | | |
| 42 | The students at this school are unfriendly to one another.* | | | | | | |
| 43 | Teachers tell me exactly what I have to do to get the grade I want. | | | | | | |
| 44 | I enjoy working with individuals who are different from me (for example, where they come from, what they look like, if they are a boy or girl, etc.) | | | | | | |
| 45 | My parents are hesitant to communicate with my teachers.* | | | | | | |
| 46 | Teachers are unavailable when I need to talk to them.* | | | | | | |
| 47 | The members of my family feel welcome at my school. | | | | | | |
| 48 | Even if they are not close friends, pupils get along well in class. | | | | | | |
| 49 | New students are made to feel unwelcome by current pupils.* | | | | | | |
| 50 | My school discourages pupils to participate in after-school activities.* | | | | | | |
| 51 | I hesitate to inform my teacher when I don't grasp something in class. * | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 52 | Adults at my school intervene when they notice children calling other students names or making fun of them. | | | | | | |
| 53 | My school attempts to keep my family informed of what goes on there. | | | | | | |
| 54 | At this school, people of many racial, cultural, and ethnic backgrounds get on very well. | | | | | | |
| 55 | This school will help me achieve my goals. | | | | | | |
| 56 | I have friends I can trust and talk to about my concerns. | | | | | | |
| 57 | My teachers guide me in determining how best to learn. | | | | | | |
| 58 | Some students tend to make others feel excluded.* | | | | | | |
| 59 | My interactions with my classmates are unpleasant.* | | | | | | |

# CLASSROOM TEST OF

# SCIENTIFIC REASONING

***Multiple Choice Version***

Directions to Students:

This is a test of your ability to apply aspects of scientific and mathematical reasoning to analyze a situation to make a prediction or solve a problem. Make a dark mark on the answer sheet for the best answer for each item. If you do not fully understand what is being asked in an item, please ask the test administrator for clarification.

## DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO

Revised Edition: August 2000 by Anton E. Lawson, Arizona State University. Based on: Lawson, A.E. 1978. Development and validation of the classroom test of formal reasoning. *Journal of Research in Science Teaching*, 15(1): 11-24.

1. Suppose you are given two clay balls of equal size and shape. The two clay balls also weigh the same. One ball is flattened into a pancake-shaped piece. *Which of these statements is correct?*

   a. The pancake-shaped piece weighs more than the ball
   b. The two pieces still weigh the same
   c. The ball weighs more than the pancake-shaped piece

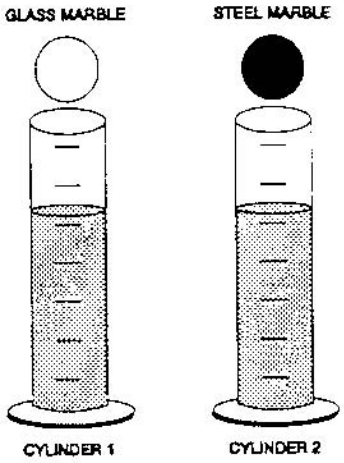
2. *because*

   a. the flattened piece covers a larger area.
   b. the ball pushes down more on one spot.
   c. when something is flattened it loses weight.
   d. clay has not been added or taken away.
   e. when something is flattened it gains weight.

3. To the right are drawings of two cylinders filled to the same level with water. The cylinders are identical in size and shape.

   Also shown at the right are two marbles, one glass and one steel. The marbles are the same size but the steel one is much heavier than the glass one.

   When the glass marble is put into Cylinder 1 it sinks to the bottom and the water level rises to the 6th mark. *If we put the steel marble into Cylinder 2, the water will rise*

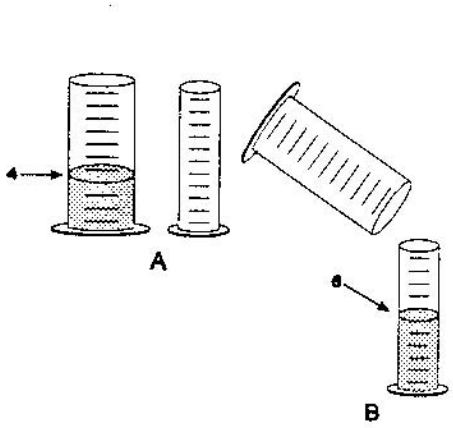



   a. to the same level as it did in Cylinder 1
   b. to a higher level than it did in Cylinder 1
   c. to a lower level than it did in Cylinder 1

4. *because*

   a. the steel marble will sink faster.
   b. the marbles are made of different materials.
   c. the steel marble is heavier than the glass marble.
   d. the glass marble creates less pressure.
   e. the marbles are the same size.

5. To the right are drawings of a wide and a narrow cylinder. The cylinders have equally spaced marks on them. Water is poured into the wide cylinder up to the 4th mark (see A). This water rises to the 6th mark when poured into the narrow cylinder (see B).




Both cylinders are emptied (not shown) and water is poured into the wide cylinder up to the 6th mark. *How high would this water rise if it were poured into the empty narrow cylinder?*

a. to about 8
b. to about 9
c. to about 10
d. to about 12
e. none of these answers is correct

6. *because*

a. the answer can not be determined with the information given.
b. it went up 2 more before, so it will go up 2 more again.
c. it goes up 3 in the narrow for every 2 in the wide.
d. the second cylinder is narrower.
e. one must actually pour the water and observe to find out.

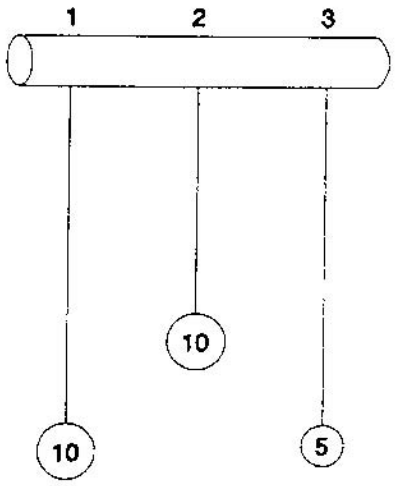
7. Water is now poured into the narrow cylinder (described in Item 5 above) up to the 11th mark. *How high would this water rise if it were poured into the empty wide cylinder?*

a. to about 7 1/2
b. to about 9
c. to about 8
d. to about 7 1/3
e. none of these answers is correct

8. *because*

a. the ratios must stay the same.
b. one must actually pour the water and observe to find out.
c. the answer can not be determined with the information given.
d. it was 2 less before so it will be 2 less again.
e. you subtract 2 from the wide for every 3 from the narrow.

9. At the right are drawings of three strings hanging from a bar. The three strings have metal weights attached to their ends. String 1 and String 3 are the same length. String 2 is shorter. A 10 unit weight is attached to the end of String 1. A 10 unit weight is also attached to the end of String 2. A 5 unit weight is attached to the end of String 3. The strings (and attached weights) can be swung back and forth and the time it takes to make a swing can be timed.



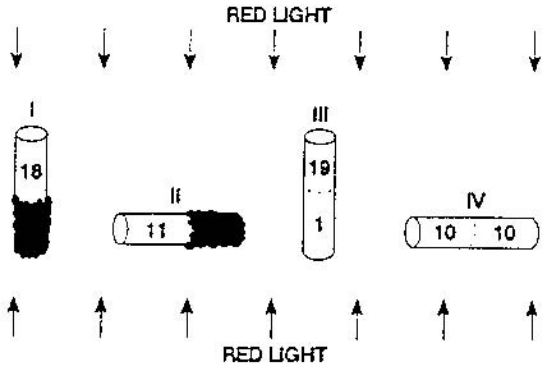

Suppose you want to find out whether the length of the string has an effect on the time it takes to swing back and forth. *Which strings would you use to find out?*

a. only one string
b. all three strings
c. 2 and 3
d. 1 and 3
e. 1 and 2

10. *because*

a. you must use the longest strings.
b. you must compare strings with both light and heavy weights.
c. only the lengths differ.
d. to make all possible comparisons.
e. the weights differ.

11. Twenty fruit flies are placed in each of four glass tubes. The tubes are sealed. Tubes I and II are partially covered with black paper; Tubes III and IV are not covered. The tubes are placed as shown. Then they are exposed to red light for five minutes. The number of flies in the uncovered part of each tube is shown in the drawing.



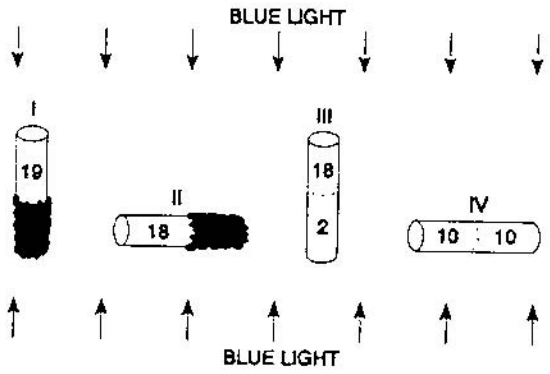

*This experiment shows that flies respond to* (respond means move to or away from):

a. red light but not gravity
b. gravity but not red light
c. both red light and gravity
d. neither red light nor gravity

12. *because*

a. most flies are in the upper end of Tube III but spread about evenly in Tube II.
b. most flies did not go to the bottom of Tubes I and III.
c. the flies need light to see and must fly against gravity.
d. the majority of flies are in the upper ends and in the lighted ends of the tubes.
e. some flies are in both ends of each tube.

13. In a second experiment, a different kind of fly and blue light was used. The results are shown in the drawing.



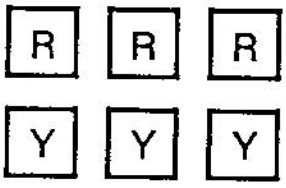

*These data show that these flies respond to* (respond means move to or away from):

a. blue light but not gravity
b. gravity but not blue light
c. both blue light and gravity
d. neither blue light nor gravity

14. *because*

a. some flies are in both ends of each tube.
b. the flies need light to see and must fly against gravity.
c. the flies are spread about evenly in Tube IV and in the upper end of Tube III.
d. most flies are in the lighted end of Tube II but do not go down in Tubes I and III.
e. most flies are in the upper end of Tube I and the lighted end of Tube II.

15. Six square pieces of wood are put into a cloth bag and mixed about. The six pieces are identical in size and shape, however, three pieces are red and three are yellow. Suppose someone reaches into the bag (without looking) and pulls out one piece. *What are the chances that the piece is red?*

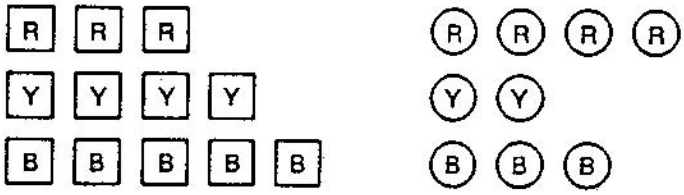



a. 1 chance out of 6
b. 1 chance out of 3
c. 1 chance out of 2
d. 1 chance out of 1
e. cannot be determined

16. *because*

a. 3 out of 6 pieces are red.
b. there is no way to tell which piece will be picked.
c. only 1 piece of the 6 in the bag is picked.
d. all 6 pieces are identical in size and shape.
e. only 1 red piece can be picked out of the 3 red pieces.

17. Three red square pieces of wood, four yellow square pieces, and five blue square pieces are put into a cloth bag. Four red round pieces, two yellow round pieces, and three blue round pieces are also put into the bag. All the pieces are then mixed about. Suppose someone reaches into the bag (without looking and without feeling for a particular shape piece) and pulls out one piece.



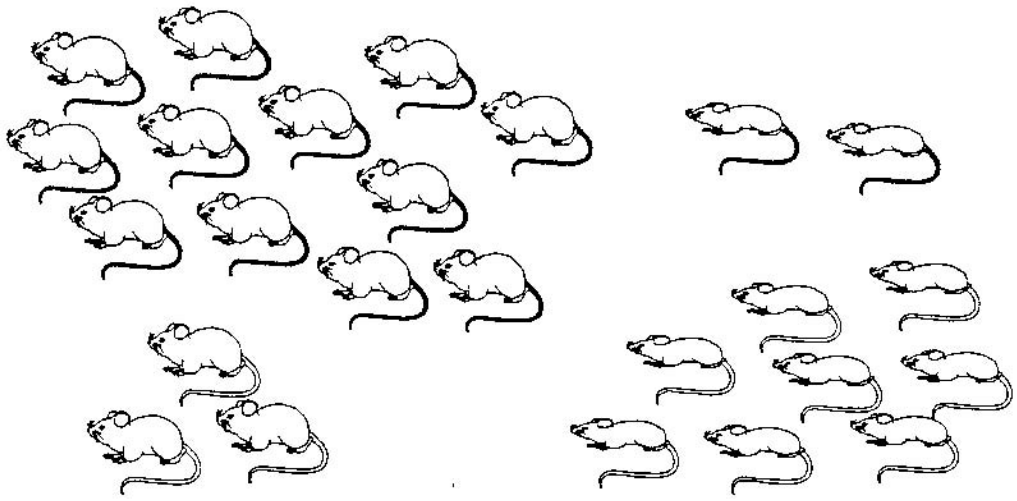

*What are the chances that the piece is a red round or blue round piece?*

a. cannot be determined
b. 1 chance out of 3
c. 1 chance out of 21
d. 15 chances out of 21
e. 1 chance out of 2

18. *because*

a. 1 of the 2 shapes is round.
b. 15 of the 21 pieces are red or blue.
c. there is no way to tell which piece will be picked.
d. only 1 of the 21 pieces is picked out of the bag.
e. 1 of every 3 pieces is a red or blue round piece.

19. Farmer Brown was observing the mice that live in his field. He discovered that all of them were either fat or thin. Also, all of them had either black tails or white tails. This made him wonder if there might be a link between the size of the mice and the color of their tails. So he captured all of the mice in one part of his field and observed them. Below are the mice that he captured.



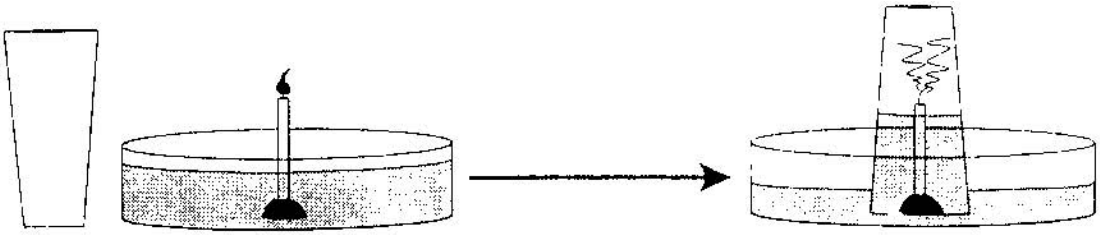
*Do you think there is a link between the size of the mice and the color of their tails?*

a. appears to be a link
b. appears not to be a link
c. cannot make a reasonable guess

20. *because*

a. there are some of each kind of mouse.
b. there may be a genetic link between mouse size and tail color.
c. there were not enough mice captured.
d. most of the fat mice have black tails while most of the thin mice have white tails.
e. as the mice grew fatter, their tails became darker.

21. The figure below at the left shows a drinking glass and a burning birthday candle stuck in a small piece of clay standing in a pan of water. When the glass is turned upside down, put over the candle, and placed in the water, the candle quickly goes out and water rushes up into the glass (as shown at the right).



This observation raises an interesting question: Why does the water rush up into the glass?

Here is a possible explanation. The flame converts oxygen into carbon dioxide. Because oxygen does not dissolve rapidly into water but carbon dioxide does, the newly formed carbon dioxide dissolves rapidly into the water, lowering the air pressure inside the glass.

Suppose you have the materials mentioned above plus some matches and some dry ice (dry ice is frozen carbon dioxide). *Using some or all of the materials, how could you test this possible explanation?*

a. Saturate the water with carbon dioxide and redo the experiment noting the amount of water rise.
b. The water rises because oxygen is consumed, so redo the experiment in exactly the same way to show water rise due to oxygen loss.
c. Conduct a controlled experiment varying only the number of candles to see if that makes a difference.
d. Suction is responsible for the water rise, so put a balloon over the top of an open-ended cylinder and place the cylinder over the burning candle.
e. Redo the experiment, but make sure it is controlled by holding all independent variables constant; then measure the amount of water rise.

22. What result of your test (mentioned in #21 above) would show that your explanation is probably wrong?

a. The water rises the same as it did before.
b. The water rises less than it did before.
c. The balloon expands out.
d. The balloon is sucked in.

23. A student put a drop of blood on a microscope slide and then looked at the blood under a microscope. As you can see in the diagram below, the magnified red blood cells look like little round balls. After adding a few drops of salt water to the drop of blood, the student noticed that the cells appeared to become smaller.

Magnified Red Blood Cells  After Adding Salt Water

This observation raises an interesting question: Why do the red blood cells appear smaller?

Here are two possible explanations: I. Salt ions ($Na^+$ and $Cl^-$) push on the cell membranes and make the cells appear smaller. II. Water molecules are attracted to the salt ions so the water molecules move out of the cells and leave the cells smaller.

To test these explanations, the student used some salt water, a very accurate weighing device, and some water-filled plastic bags, and assumed the plastic behaves just like red-blood-cell membranes. The experiment involved carefully weighing a water-filled bag, placing it in a salt solution for ten minutes and then reweighing the bag.

*What result of the experiment would best show that explanation I is probably wrong?*

a. the bag loses weight
b. the bag weighs the same
c. the bag appears smaller

24. *What result of the experiment would best show that explanation II is probably wrong?*

a. the bag loses weight
b. the bag weighs the same
c. the bag appears smaller

**Procrastination Scale** (Lay, 1986) - For student populations

Instructions:

People may use the following statements to describe themselves. For each statement, decide whether the statement is uncharacteristic or characteristic of you using the following 5 point scale. Note that the 3 on the scale is Neutral – the statement is neither characteristic nor uncharacteristic of you. In the box to the right of each statement, fill in the number on the 5 point scale that best describes you.

| Extremely Uncharacteristic | Moderately Uncharacteristic | Neutral | Moderately Characteristic | Extremely Characteristic |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

| | | |
|---|---|---|
| 1. | I often find myself performing tasks that I had intended to do days before. | ☐ |
| 2.* | I do not do assignments until just before they are to be handed in. | ☐ |
| 3.* | When I am finished with a library book, I return it right away regardless of the date it is due. | ☐ |
| 4. | When it is time to get up in the morning, I most often get right out of bed. | ☐ |
| 5. | A letter may sit for days after I write it before mailing it. | ☐ |
| 6. | I generally return phone calls promptly. | ☐ |
| 7. | Even with jobs that require little else except sitting down and doing them, I find they seldom get done for days. | ☐ |
| 8. | I usually make decisions as soon as possible. | ☐ |
| 9. | I generally delay before starting on work I have to do. | ☐ |
| 10.* | I usually have to rush to complete a task on time. | ☐ |
| 11. | When preparing to go out, I am seldom caught having to do something at the last minute. | ☐ |
| 12. | In preparing for some deadline, I often waste time by doing other things. | ☐ |
| 13.* | I prefer to leave early for an appointment. | ☐ |
| 14.* | I usually start an assignment shortly after it is assigned. | ☐ |
| 15. | I often have a task finished sooner than necessary. | ☐ |
| 16. | I always seem to end up shopping for birthday or Christmas gifts at the last minute. | ☐ |
| 17. | I usually buy even an essential item at the last minute. | ☐ |
| 18. | I usually accomplish all the things I plan to do in a day. | ☐ |
| 19. | I am continually saying “I’ll do it tomorrow”. | ☐ |
| 20. | I usually take care of all the tasks I have to do before I settle down and relax for the evening. | ☐ |

Note: Reversed-keyed items: 3,4,6,8,11,13,14,15,18,20

Note: * indicates items that differ from student to non-student forms

## References

Lay, C. (1986). At last, my research article on procrastination. *Journal of Research in Personality*, *20*, 474-495.

# *Perceived Parental Autonomy Support Scale (P-PASS)*

## Please cite the validation paper:

Mageau, G. A., Ranger, F., Joussemet, M., Koestner, R., Moreau, E., & Forest, J. (2015). Validation of the Perceived Parental Autonomy Support Scale (P-PASS). *Canadian Journal of Behavioural Science, 47,* 251-262. FI = 0.85.

Paper that successfully used the scale :

Bureau, J. & Mageau, G. A. (2014). Parental autonomy support and honesty: The mediating role of identification with the honesty value and perceived costs and benefits of honesty. *Journal of Adolescence, 37*, 225-236.

Papers that successfully used an adapted version of the scale :

**At work:**

*Moreau, E.*, & Mageau, G. A. (2012). The importance of perceived autonomy support for the psychological health and work satisfaction of health professionals: Not only supervisors count, colleagues too! *Motivation and Emotion, 36,* 268-286.

**With children aged 8 to 12 years:**

Joussemet, M., Mageau, G. A., *&* Koestner, R. (in press). Promoting Optimal Parenting and Children's Mental Health: A Preliminary Evaluation of the How-to Parenting Program. *Journal of Child and Family Studies.*

# YOUR PERCEPTION OF YOUR PARENTS

Please answer the following questions about your mother and father while you were growing up. If you did not have any contact with one of your parents (for example, your father), but another parent of the same sex lived with you (for example, your stepfather), please answer the questions about this other adult.

*If you did not have any contact with one of your parents, and no other adult of the same sex lived with you, please leave the questions about this parent blank.*

Using the scale bellow, please indicate the extent to which you agree with each of the statements regarding your mother and father's behaviors.

| Do not agree at all 1 | Hardly agree 2 | Slightly agree 3 | Somewhat agree 4 | agree 5 | Strongly agree 6 | Very strongly agree 7 |
|---|---|---|---|---|---|---|

***BE CAREFUL, the order of responses for your mother and father changes for each item.***

## WHEN I WAS GROWING UP …

| | |
|---|---|
| 1. My parents gave me many opportunities to make my own decisions about what I was doing. | **Mother 1 2 3 4 5 6 7**<br>*Father* 1 2 3 4 5 6 7* |
| 2. When my parents asked me to do something, they explained why they wanted me to do it. | *Father* 1 2 3 4 5 6 7*<br>**Mother 1 2 3 4 5 6 7** |
| 3. When I refused to do something, my parents threatened to take away certain privileges in order to make me do it. | **Mother 1 2 3 4 5 6 7**<br>*Father* 1 2 3 4 5 6 7* |
| 4. My point of view was very important to my parents when they made important decisions concerning me. | *Father* 1 2 3 4 5 6 7*<br>**Mother 1 2 3 4 5 6 7** |
| 5. My parents refused to accept that I could want simply to have fun without trying to be the best. | **Mother 1 2 3 4 5 6 7**<br>*Father* 1 2 3 4 5 6 7* |
| 6. When my parents wanted me to do something differently, they made me feel guilty. | *Father* 1 2 3 4 5 6 7*<br>**Mother 1 2 3 4 5 6 7** |
| 7. My parents encouraged me to be myself. | **Mother 1 2 3 4 5 6 7**<br>*Father* 1 2 3 4 5 6 7* |
| 8. Within certain limits, my parents allowed me the freedom to choose my own activities. | *Father* 1 2 3 4 5 6 7*<br>**Mother 1 2 3 4 5 6 7** |
| 9. When I was not allowed to do something, I usually knew why. | **Mother 1 2 3 4 5 6 7**<br>*Father* 1 2 3 4 5 6 7* |
| 10. I always had to do what my parents wanted me to do, if not, they would threaten to take away privileges. | *Father* 1 2 3 4 5 6 7*<br>**Mother 1 2 3 4 5 6 7** |
| 11. My parents believed that, in order to succeed, I always had to be the best at what I did. | **Mother 1 2 3 4 5 6 7**<br>*Father* 1 2 3 4 5 6 7* |
| 12. My parents made me feel guilty for anything and everything. | *Father* 1 2 3 4 5 6 7*<br>**Mother 1 2 3 4 5 6 7** |
| 13. My parents were able to put themselves in my shoes and understand my feelings. | **Mother 1 2 3 4 5 6 7**<br>*Father* 1 2 3 4 5 6 7* |

| | |
|---|---|
| 14. My parents hoped that I would make choices that corresponded to my interests and preferences regardless of what theirs were. | *Father** *1 2 3 4 5 6 7*<br>**Mother 1 2 3 4 5 6 7** |
| 15. When my parents wanted me to do something, I had to obey or else I was punished. | **Mother 1 2 3 4 5 6 7**<br>*Father* 1 2 3 4 5 6 7* |
| 16. My parents were open to my thoughts and feelings even when they were different from theirs. | *Father* 1 2 3 4 5 6 7*<br>**Mother 1 2 3 4 5 6 7** |
| 17. In order for my parents to be proud of me, I had to be the best. | **Mother 1 2 3 4 5 6 7**<br>*Father* 1 2 3 4 5 6 7* |
| 18. When my parents wanted me to act differently, they made me feel ashamed in order to make me change. | *Father* 1 2 3 4 5 6 7*<br>**Mother 1 2 3 4 5 6 7** |
| 19. My parents made sure that I understood why they forbid certain things. | **Mother 1 2 3 4 5 6 7**<br>*Father* 1 2 3 4 5 6 7* |
| 20. As soon as I didn't do exactly what my parents wanted, they threatened to punish me. | *Father* 1 2 3 4 5 6 7*<br>**Mother 1 2 3 4 5 6 7** |
| 21. My parents used guilt to control me. | **Mother 1 2 3 4 5 6 7**<br>*Father* 1 2 3 4 5 6 7* |
| 22. My parents insisted that I always be better than others. | *Father* 1 2 3 4 5 6 7*<br>**Mother 1 2 3 4 5 6 7** |
| 23. When I asked why I had to do, or not do, something, my parents gave me good reasons. | **Mother 1 2 3 4 5 6 7**<br>*Father* 1 2 3 4 5 6 7* |
| 24. My parents listened to my opinion and point of view when I disagreed with them. | *Father* 1 2 3 4 5 6 7*<br>**Mother 1 2 3 4 5 6 7** |

# Scoring key

***AUTONOMY-SUPPORT***

*OFFERING CHOICE WITHIN CERTAIN LIMITS*
4 items
1, 4, 8, 14

*EXPLAINING THE REASONS BEHIND THE DEMANDS, RULES, AND LIMITS*
4 items
2, 9, 19, 23

*BEING AWARE OF, ACCEPTING, AND RECOGNIZING THE CHILD'S FEELINGS*
4 items
7, 13, 16, 24

***PSYCHOLOGICAL CONTROL***

*THREATENING TO PUNISH THE CHILD*
4 items
3, 10, 15, 20

*INDUCING GUILT*
4 items
6, 12, 18, 21

*ENCOURAGING PERFORMANCE GOALS*
4 items
5, 11, 17, 22

*NOTA BENE*

1. *Because autonomy support and psychological control are opposite poles of a same continuum, that of children's perception of autonomy, it should be possible to recode the psychological control items to create a single composite that represents autonomy support. However, some researchers think that because they form two factors, they should not be combined. The trend is thus to investigate them separately.*

## ACHIEVEMENT TEST IN PHYSICS FOR CLASS 12TH

**Please fill in the following information:** **Date** | | | | | | | | |

**Name : ……** **Date of birth** | | | | | | | | |

**Sex: Male** ☐ **Female** ☐ **Area:** **Urban** ☐ **Rural** ☐

**Type of family:** **Nuclear** ☐ **Joint** ☐

**Type of Institution:** **Govt.** ☐ **Private** ☐

**Name of the School : …….**

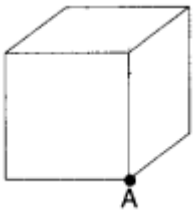
**Instructions:**

**Time: 2 Hours** **Total Marks: 90**

Please read the questions carefully before answering. Kindly make sure that you have dealt with all statements. Your information will be kept confidential.

**MULTIPLE CHOICE QUESTIONS (70 X 1= 70)**

1. Solve the given problem. If a charge is applied to the cube's corner A, the total flux through the cube's faces with side length an will be




(a) $\frac{q}{8\varepsilon_0}$ (b) $\frac{q}{4\varepsilon_0}$

(c) $\frac{q}{2\varepsilon_0}$ (d) $\frac{q}{\varepsilon_0}$

2. Identify which of the following statements regarding Gauss's law is untrue?

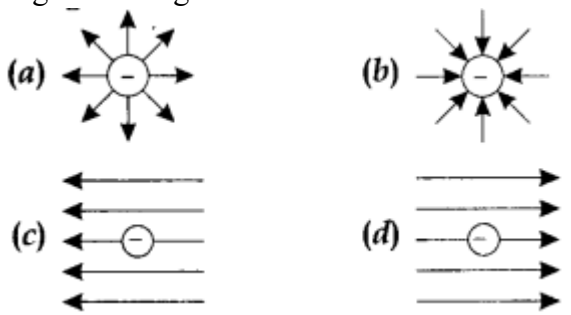
(A) Any closed surface is subject to Gauss's law.

(b) The total of all charges contained by the surface is included in the word q on the right side of Gauss's law.

(c) When the system has considerable symmetry, Gauss's law is not very helpful in determining the electrostatic field.

(d) Gauss's law is based on the coulomb's law's inverse square dependence on distance.

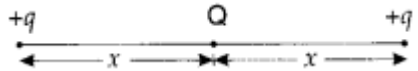
3. Indicate which among the following images best captures the lines created by a single negative charge in an electric field?




4. The electric dipole moment is measured in

(a) newton (b) coulomb (c) farad (d) debye

5. As illustrated in the image, a charge Q is positioned in the middle of the line connecting the two point charges +q and +q. Compute the ratio of charges Q and q.




(a) 4 (b) ¼ (c) -4 (d) -1/4

6. Consider a situation where W represents the amount of work required to move a unit positive charge from an infinite distance to a position that is x distance away from a positive charge Q. In this case, the potential at that point is

(a) $\frac{WQ}{x}$ (b) W

(c) $\frac{W}{x}$ (d) WQ

7. An electric dipole of moment $\vec{p}$ is placed in a uniform electric field $\vec{E}$. Examine the given statements and select the correct option.

(i) the torque on the dipole is $\vec{p} \times \vec{E}$

(ii) the potential energy of the system is $\vec{p} . \vec{E}$

(iii) the resultant force on the dipole is zero. Choose the correct option.

(a) (i), (ii) and (iii) are correct (b) (i) and (iii) are correct and (ii) is incorrect

(c) only (i) is correct (d) (i) and (ii) are correct and (iii) is incorrect

8. The equivalent of 1 volt is

(a) $\frac{\text{newton}}{\text{second}}$ (b) $\frac{\text{newton}}{\text{coulomb}}$

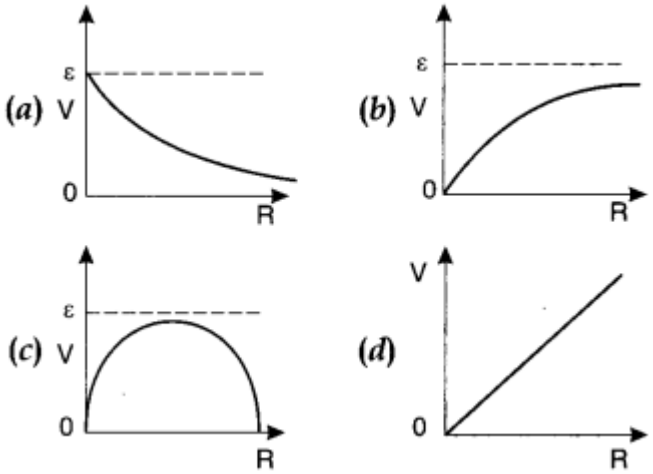
(c) $\frac{\text{joule}}{\text{coulomb}}$ (d) $\frac{\text{joule}}{\text{second}}$

9. Imagine that a capacitor is connected to a dc source and contains some dielectric between its plates. The dielectric is now removed after which the battery is detached. Predict what will happen?

(a) capacitance will increase. (b) energy stored will decrease.

(c) electric field will increase. (d) voltage will decrease.

10. A cell connected across a changeable external resistance R has an internal resistance r and an emf E. Decide which graph shows the plot of the potential difference V across R when the resistance R is raised.




11. What will happen in a series combination of two or more resistances?

(A) The same current flows through each resistance.

(b) Each resistance receives the same voltage.

(c) No two resistances have the same voltage or current.

(d) The voltage and current flowing through each resistance are identical.

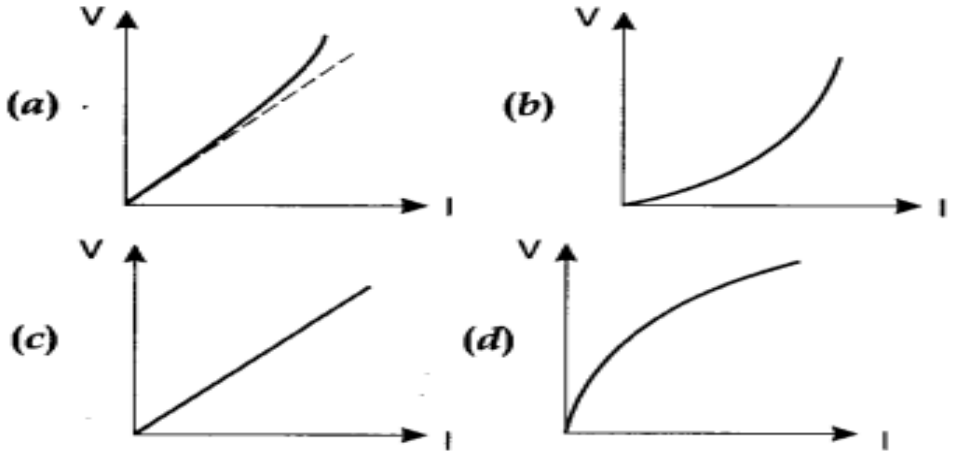
12. When there is parallel combination of n cells

(a) more voltage (b) more current (c) less voltage (d) less current

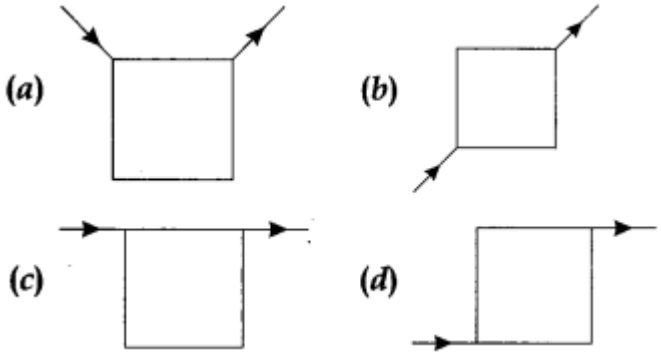
13. When a metal conductor connected to left gap of a meter bridge is heated, the balancing point

(a) shifts to the right (b) shifts to the left (c) doesn't change (d) stays at zero

14. The following are the V-I graph of a good conductor. Identify the correct one.



15. As depicted in the illustration, current flows through uniform, square frames. Assess in what case is the magnetic field at the frame's centre greater than zero?




16. Parallel and anti-parallel currents' characteristics are

(a) parallel currents repel, and antiparallel currents attract.

(b) parallel currents attract, and antiparallel currents repel.

(c) both currents attract.

(d) both currents repel.

17. A current carrying loop is placed in a uniform magnetic field. The torque acting on it does not depend upon

(a) area of loop (b) value of current (c) magnetic field (d) None of these

18. A moving coil galvanometer is transformed into a voltmeter by

(a) introducing a resistance of large value in series.

(b) introducing a resistance of small value in parallel.

(c) introducing a resistance of large value in parallel.

(d) introducing a resistance of small value in series.

19. Analyse what happens when a magnetic compass needle is carried nearby to a straight wire carrying current.

(I) the straight wire cause a noticeable deflection in the compass needle.

(II) the alignment of the needle is tangential to an imaginary circle with straight wire as its centre and has a plane perpendicular to the wire

(a) (I) is correct (b) (II) is correct

(c) both (I) and (II) are correct (d) neither (I) nor (II) is correct

20. Identify which of the following statements regarding magnetic forces is true?

(a) Magnetic forces always obey Newton’s third law.

(b) Magnetic forces do not obey Newton’s third law.

(c) For very high current, magnetic forces obey Newton’s third law.

(d) Inside low magnetic field, magnetic forces obey Newton’s third law.

21. The magnetic field of the earth behaves like a magnet, pointing roughly in the directions of

(a) North to South (b) South to North (c) East to West (d) West to East

22. The magnetic field of the earth has a strength that is

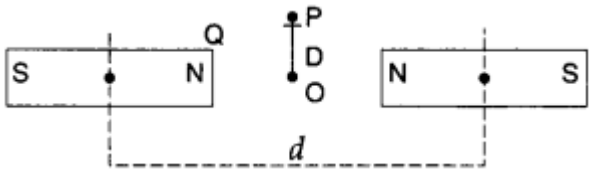
(a) constant everywhere. (b) zero everywhere.

(c) having very high value. (d) vary from place to place on the earth's surface.

23. The angle of dip is at a specific location where the earth's magnetic field's horizontal and vertical components are equal. Select the correct angle.

(a) 30° (b) 75° (c) 60° (d) 45°

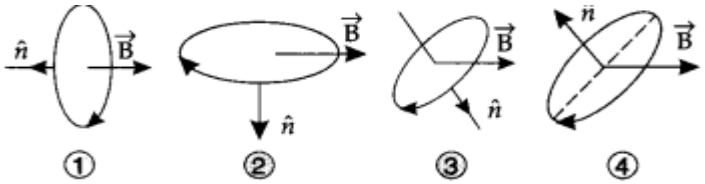
24. The centres of two identical bar magnets are placed at a distance d apart. As indicated in the figure, a stationary charge Q is positioned at P between the gaps of the two magnets, at a distance D from the centre O. Calculate the force on charge Q.




(a) zero (b) directed along OP

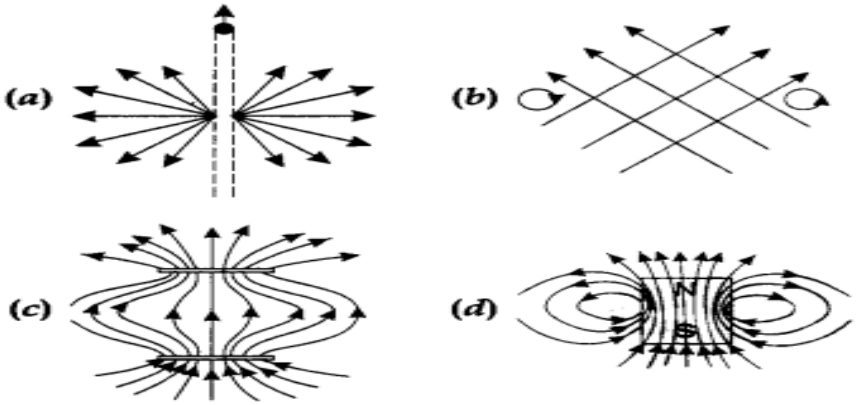
(c) directed along PO (d) directed perpendicular to the plane of paper

25. A current carrying loop is placed in a uniform magnetic field in four different orientations as shown in figure. Arrange them in the decreasing order of potential energy.




(a) 4, 2, 3,1 (b) 1, 4, 2, 3 (c) 4, 3, 2,1 (d) 1, 2, 3, 4

26. Identify the correct direction of magnetic field from the provided images.




27. Faraday's laws are consequence of the conservation of

(a) charge (b) energy (c) magnetic field (d) both (b) and (c)

28. Suppose there is a uniform magnetic field directed perpendicular and into the plane of the paper. An irregular shaped conducting loop is slowly changing into a circular loop in the plane of the paper. When this happens,

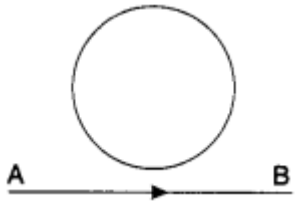
(a) The loop experiences an anticlockwise induction of current.

(b) The loop experiences a clockwise induction of current.

(c)The loop induces ac in case.

(d) The loop does not induce any current.

29. In the given figure current from A to B in the straight wire is decreasing. What can you infer about the direction of induced current in the loop?




(a) clockwise (b) anticlockwise (c) changing (d) nothing can be said

30. A metal plate can be heated by

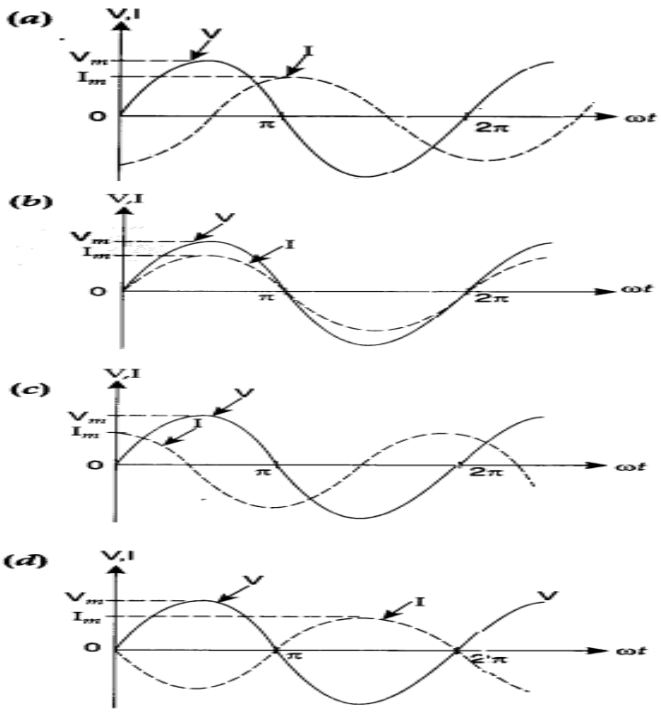
(a) running alternating or direct current through the plate.

(b) putting in a magnetic field that changes over time.

(c) introducing a magnetic field that changes but is not time-varying into an environment.

(d) both (a) and (b) are true

31. Identify the best illustration of the phase connection between current and voltage in a pure resistive circuit.



32. In the case of an inductor

(a) voltage lags the current by π2 (b) voltage leads the current by π2

(c) voltage leads the current by π3 (d) voltage leads the current by π4

33. Quality factor and power factor both have the dimensions of

(a) time (b) frequency (c) work (d) angle

34. A transformer works on the principle of

(a) self-induction (b) electrical inertia

(c) mutual induction (d) magnetic effect of the electrical current

35. When the frequency of the supply is raised, the current in an alternating current circuit with elements connected in series rises. Analyse which of the following components is likely to make up the circuit?

(a) Only resistor (b) Resistor and inductor (c) Resistor and capacitor (d) Only inductor

36. The displacement current and conduction current are same when the source is

(a) ac only (b) dc only (c) either ac or dc (d) neither dc nor ac

37. Artificial satellites communicate using waves that are

(a) microwaves (b) infrared waves (c) radio waves (d) X-rays

38. Determine what type of electromagnetic wave is used in medicine to kill cancer cells?

(a) IR-rays (b) Visible rays (c) Gamma rays (d) Ultraviolet rays

39. Which of the following, for each position of the object, creates a virtual and upright image?

(a) Concave lens (b) Concave mirror (c) Convex mirror (d) Both (a) and (c)

40. Which of the following white light colours deviates the most when it is passed through a prism?

(a) Red light (b) Violet light (c) Yellow light (d) Both (a) and (b)

41. Even in crystal clear water, an underwater swimmer cannot see very clearly due to

(a) absorption of light in water (b) scattering of light in water

(c) reduction of speed of light in water (d) change in the focal length of eye lens

42. Phenomenon of mirage occurs due to

(a) refraction of light (b) reflection of light

(c) total internal reflection of light (d) diffraction of light.

43. Explain what happens when interference of light takes place

(a) energy is created in the region of maximum intensity

(b) energy is destroyed in the region of maximum intensity

(c) conservation of energy holds good and energy is redistributed

(d) conservation of energy does not hold good

44. An optically active compound

(a) rotates the plane of polarised light (b) changes the direction of polarised light

(c) does not allow plane polarised light to pass through (d) none of these

45. The idea of secondary wavelets for the. propagation of a wave was first given by

(a) Newton (b) Huygens (c) Maxwell (d) Fresnel

46. Distinguish which among the following is correct for light deviating from a point source?

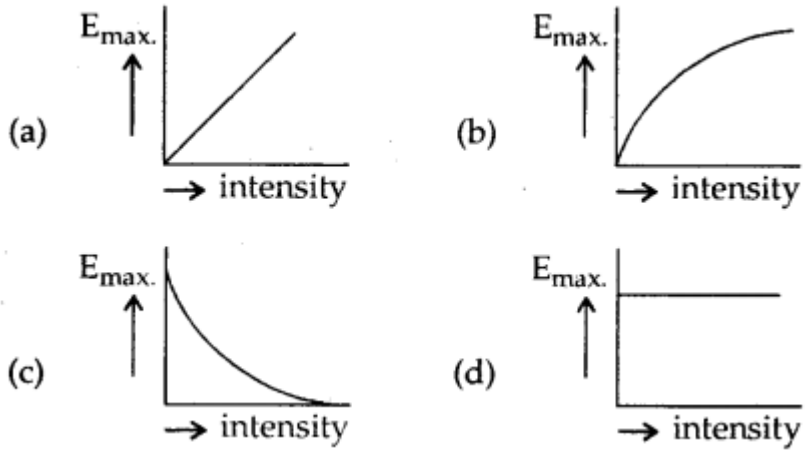
(a) The intensity decreases in proportion with the distance squared.

(b) The wavefront is parabolic.

(c) The intensity at the wavelength does not depend on the distance.

(d) None of these.

47. Evaluate which of the following graphs best depicts the relationship between the intensity of incident radiations with a constant frequency and the fluctuation in maximum kinetic energy Emax?




48. The best metal to be used for photoemission is:

(a) Potassium (b) Lithium (c) Sodium (d) Cesium

49. When light is directed at the metal surface, the emitted electrons:

(a) are called photons (b) have energies that depend upon the intensity of light.

(c) have random energies. (d) have energies that depend upon the frequency of light.

50. If the wavelength associated with n electron is 1Å calculate the potential difference required for accelerating it.

(a) 100 V (b) 150 V (c) 250 V (d) $10^3$ V

51. A spectral line is emitted when an electron

(a) jumps from lover orbit to higher orbit. (b) jumps from higher orbit to lower orbit.

(c) rotates in a circular orbit. (d) rotates in an elliptical orbit.

52. At the time of total solar eclipse, the spectrum of solar radiation would be

(a) a large number of dark Fraunhoffer lines

(b) a small number of dark Fraunhofer lines.

(c) All Fraunhofer lines changed into brilliant colours.

(d) None of these.

53. How does the energy difference between two consecutive energy levels vary when the quantum number n increases?

(a) does not change (b) decreases (c) increases (d) may increase or decrease.

54. Which of the following type ot radiation is not emitted by the electronic structure of atoms :

(a) X-rays (b) Visible light (c) γ-rays (d) Ultraviolet light.

55. When the number of nucleons in nuclei increases, the binding energy per nucleon numerically

(a) increases continuously with mass number.

(b) decreases continuously with mass number.

(c) First increases and then decreases with increase of mass number.

(d) Remains constant with mass number.

56. Which of the following is the best nuclear fuel.

(a) Thorium-236 (b) Plutonium – 239 (c) Neptunium-239 (d) Uranium-236.

57. Heavy water is used as a moderator in a nuclear reactor. The function of the moderator is to

(a) absorb neutrons and stop chain reaction (b) To cool the reactor

(c) To slow down the neutrons to thermal energies. (d) To control the energy released.

58. Which of the following nuclei is most stable

(a) even-even (b) odd-odd (c) odd-even (d) even-odd

59. Fusion reactions place at high temp, because

(a) Kinetic energy is high enough to overcome repulsion between nuclei.

(b) Nuclei break up at high temperature.

(c) Atoms are ionised at high temperature.

(d) Molecules break up at high temperature.

60. If the conductivity of a semiconductor is only due to break of the covalent band due to the thermal excitation, then the semiconductor is called:

(a) intrinsic (b) extrinsic (c) Acceptor (d) none of these

61. A hole in a p-type semiconductor is-

(a) an excess electron (b) A missing atom (c) A missing electron (d) A donor level.

62. The Voltage gain is highest for

(a) common emitter amplifier (b) common base amplifier

(c) common collector amplifier. (d) Equal in all the three.

63. In the common emitter amplifier, the phase difference between the input voltage and output voltage signal across the collector and emitter is:

(a) 0 (b) $\pi/2$ (c) $\pi$ (d) $\pi/4$

64. In common base amplifier, the phase difference between the input and output voltage signal is

(a) 0 (b) $\pi/2$ (c) $\pi/4$ (d) $\pi$

65. The conductivity of semiconductors like Ge and Si:

(a) increases when it is doped with pentavalent impurity.

(b) increases when it is doped with trivalent impurity.

(c) increases when it is doped with pentavalent or trivalent impurity.

(d) none

66. Indicate what happens when the frequency deviation is doubled in FM?

(a) Modulation is doubled (b) Modulation is halved

(c) Carrer swing is halved (d) The modulation index is decreased

67. The term used “to collect the information about an object and a place without physical contact” is called :

(a) modulation (b) communication (c) amplification (d) remote sensing

68. The space waves which are affected seriously by atmospheric conditions are:

(a) MF (b) HUF (c) VHF (d) UHF

69. In space communication, the sound waves can be sent from one place to another:

(a) through space

(b) through wires

(c) by superimposing it on undamped electro-magnetic waves

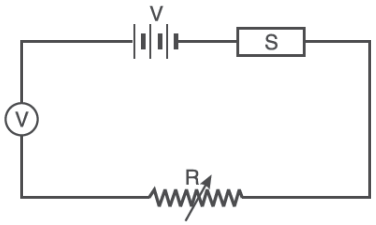
(d) by superimposing it on damped electro-magnetic waves

70. Communication channel consists of:

(a) transmission line only (b) optical fibre only (c) free space only (d) All of the above

**SHORT ANSWER QUESTIONS (10 X 2= 20)**

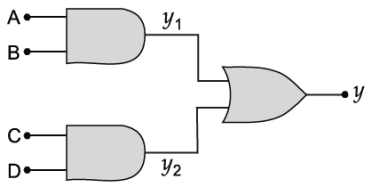
71. Explain why vehicles suffer from ignition failure in damp weather and also in cold areas.
72. The figure shown below shows a piece of pure semi-conductor S in a series with a variable resistor R and a source of constant voltage V. Analyse the circuit diagram and answer whether you would increase or decrease the value of R to keep the reading of Ammeter A constant when semi-conductor S is heated? Also explain the reason.




73. Why does the earth's magnetic field not affect the working of a moving coil galvanometer?
74. Suppose there are two spherical balls of the same size- one made of metal and the other made of glass. If both are thrown freely from the same height above the ground at the same time, establish which of the two will reach the ground earlier.
75. Analyse the wavelengths of the following radiations and arrange them in the descending order of wavelength:

    X-ray, Infrared ray, Red light, Yellow light, Radiowave

76. A myopic person uses spectacles of power -1.0 dioptre for distinct vision. As he gets older, he might have to use a separate reading glass of power +2.0 dioptre. Explain what may have happened?
77. If radiation has both particle and wave properties, how can one decide which property to use in describing physical phenomenon?
78. he spectrum of hydrogen atom has many lines although a hydrogen atom has only one electron. Justify.
79. Create the Boolean expression for the logic circuit shown below.




80. What mode of communication is employed for transmission of TV signals? Explain why TV towers are usually made very high.