Entry-Level Apprenticeship Aptitude Sample Test

This test has been created as a sample for employers and apprentices to illustrate the types of core skills in basic mathematics, physics and reasoning that will be necessary for success in the academic portions of trades training. This test is intended as a guideline and an example only and not as a substitute for formal evaluation testing. If an individual can successfully pass this test with no difficulties they will be more likely to pass any entry level test requirements for their chosen trade. The test has been designed to incorporate questions ranging up to Physics 12 and Math 12, not all trades require this level of education, so please see the BC Trades Training Grid for more information in regards to the trade which is of interest to you.

For further practice testing you may find the following sites helpful:

BCIT – Practice Tests for Upgrading
http://www.bcit.ca/admission/upgrading/testoptions.shtml

Camosun College Assessment Centre–
http://camosun.ca/services/assessment/sample.html

CNC Student Success Centre
http://www.cnc.bc.ca

If you would like to create a formal testing component in your apprentice development program for your business please visit the sites below for further information:

BCIT – TRADES TESTING
BCIT is the ideal impartial third party to assist recruiters in selecting the best trades candidates. Many companies have optimized and augmented their internal resources with BCIT's sequence of customized screening and testing tools, including written and practical assessments, and private interviews when hiring millwrights, machinists, sheet metal workers, instrumentation operators and many other skilled personnel. http://www.mechanical.bcit.ca/indserv/services.shtml

T.R.A.D.E.S. (Trades Referral Assessment, Direct Employment Strategy)
No Fee Employment Assistance Services and Workshops
Available to Unemployed Adults & Youth
http://www.tradesbc.org/home.html

LANGUAGE SKILLS

Vocabulary

This section consists of items requiring you to recognize words that have a similar or opposite meaning of the underlined word.

In questions 1 – 4, circle the word or phrase that means the same or about the same as the underlined word.

1. defective component

   a. real b. good c. suitable d. faulty

2. effectively completed

   a. cheaply b. properly c. expensively d. occasionally

3. specific instructions

   a. unclear b. optional c. detailed d. verbal

4. accurate assessment

   a. correct b. secret c. neat d. fixed

5. A template is

   a. hand shears b. metal cutting saw c. pattern d. paper punch

In questions 5 – 8, chose the word that means the opposite of the underlined word.

6. assist a coworker

   a. belief b. reward c. ignore d. help

7. punctual attendance

   a. take b. new c. on time d. late

8. ventilated workspace

   a. open b. closed c. brightly lit d. locked

9. tedious job

   a. repetitive b. noxious c. tiresome d. interesting

10. essential task

    a. optional b. time-consuming c. necessary d. suggested

Reading Comprehension

Reading Passage 1:

Temporary Turbines, Inc.

Safety Memo

To: All Supervisors
From: Safety & Training Department
Subject: Portable Electrical Tools

The recent rash of accidents at our plant should have taught all of us a lesson: portable electric power tools can be very hazardous if they are not used properly. Because of the seriousness of this matter, the Safety & Training Department is setting forth the following guidelines. Please inform all employees in your department that these simple common-sense guidelines must be strictly adhered to at all times. Supervisors will be held responsible for any infractions.

Some of our older portable electric tools do not have automatic shut-off controls to make them stop operating when the worker's hand is removed from the on-off switch. Before plugging in these tools, make sure that the switch is in the "off" position. Failure to do so could result in the tool starting unexpectedly and causing an accident.

Tool cords, extension cords, and plugs must be routinely inspected every time a worker checks out a tool from inventory. A tool must not be used if it has worn cords or broken plugs. Defective tool cords and plugs must be replaced as soon as possible by the Maintenance Department.

Most important, electric power tools must never be used by people who have not been trained to use them. Supervisors must make sure that anyone assigned to work with a tool has a thorough knowledge of all the procedures pertaining to its use and care. Failure to do so will be looked upon as supervisory negligence.

Questions – Passage 1

1. According to the memo, workers should

    a) repair broken tools
    b) inspect plugs when equipment is checked out
    c) ask their supervisors to replace worn extension cords
    d) use slightly damaged tools only with a supervisor's permission

2. The memo states that the most important principle concerning portable electric tools is that they should be used only

    a) by people who have been trained in their use
    b) if it can be shown that they are not dangerous
    c) if they have automatic shut-off controls
    d) under a supervisor's guidance

3. The main point of this memo about portable electric power tools is to discuss their

    a) advantages
    b) disadvantages
    c) safe operation
    d) repair

4. The memo also states that the high accident rate

    a) was due to untrained people using hazardous tools
    b) was the fault of the supervisors
    c) will result in firing of the person or persons involved
    d) was the reason for setting out the guidelines

5. The guidelines set forth in this memo concern

    a) all the employees
    b) supervisors only
    c) special departments only
    d) all power tools

6. The person responsible for making employees aware of these guidelines is
    a) each employee
    b) an employee's supervisor
    c) a representative from the Worker's Compensation Board
    d) the company safety auditor

Reading Comprehension

Reading Passage 2:

TRADE TIPS for TECHNICAL WORKERS in BC

Blueprint reading is the universal language used by mechanics, technicians, builders, engineers, and designers all over the world. Trades people everywhere depend on them to convey necessary information about the various parts of many different machines and buildings. This is because the shape, size, and appearance of every part is graphically described in necessary detail. Pictures, photographs, by comparison, are simply not precise or detailed enough to do the job. Unlike blueprints, they do not indicate correct sizes, and may not show hidden sections or parts.

When blueprints are used in manufacturing or construction, each part produced can be made to a specific size and shape. A person trained in blueprint reading can look at the blueprint and visualize every part needed for a product.

For all of these reasons, learning how to read and interpret blueprints is an important part of vocational training.

Questions – Passage 2

1. In which one of the following qualities is a blueprint superior to a photograph?

    a. precision
    b. proportion
    c. appearance
    d. colour

2. Learning how to read blueprints enables a trades expert to

    a. improve the quality of manufactured products
    b. become more inventive and turn out more creative work
    c. join the international community of engineers and designers
    d. identify all the parts of a machine regardless of where the machine was made

3. The passage suggests that if Japanese mechanics or carpenters looked at some French blueprints, they would

    a. be able to read the French blueprints as easily as they could read Japanese blueprints
    b. need some help before they could read the French blueprints
    c. find the French blueprints so different from the Japanese blueprints that they would need an interpretive guide
    d. be unable to read the French blueprints unless they repeated their trades and technical training in French-based trades training.

4. The passage suggests that a person untrained in blueprint reading would

    a. be able to identify most of the machine parts described, with a little practice
    b. be able to visualize the object in a blueprint, except for hidden parts
    c. have trouble visualizing the object described in a blueprint
    d. not be able to understand some of the words used in a blueprint

5. What is the main point of the passage

    a. blueprints are a different way of showing machine parts than pictures
    b. blueprints provide precise information about the size and shape of every part
    c. blueprints show machine operations in graphic detail
    d. blueprints and photographs are both useful to people in the trades

6. If a tradesperson from Mexico wanted to work in Canada, they would need to be able to read blueprints in which one of the following languages
    a. French
    b. Spanish
    c. English
    d. None of the above

APPLIED MATH, SCIENCE and REASONING SKILLS

Section A

1. The number 6 400 082 in words is:
    a. Six million, four thousand, eighty two
    b. Six million, forty thousand, eighty two
    c. Six million, four hundred, eighty two
    d. Six million, four hundred thousand, eighty two

2. Choose the answer which best completes the number pattern:

    12 18 ____ 30 36

    a. 20
    b. 24
    c. 22
    d. 28

3. Add the following quantities: 3742 + 4719 + 11 + 374
    a. 8736
    b. 8746
    c. 8836
    d. 8846

4. A new drill bit is regularly priced at $24.98 It is on sale with a discount of 15%. Approximately how much would be saved by purchasing the drill bit while it is on sale?
    a. $3.75
    b. $3.70
    c. $21.23
    d. $20.48

5. Gary answered all 60 questions on his final exam. If he scored 82% on the test, how many questions did he get right?
    a. 49
    b. 11
    c. 18
    d. 37

6. If 5.7 litres of paint is required to cover 53 m^2 of wall area, how many m^2 of wall area could be painted with 10 litres of paint?

    a. 55 m^2
    b. 78 m^2
    c. 83 m^2
    d. 93 m^2

7. Round 8764 to the nearest hundred.
    a. 8000
    b. 8700
    c. 8800
    d. 8760

8. If a jet travels 815 kms per hour how many kms will it travel in 12 hours and 45 minutes.
    a. 10,052 kms
    b. 10,391 kms
    c. 12,281 kms
    d. 12,815 kms

9. An oil tank is 3/8 full. It takes 180 more litres to fill the tank. The number of litres the tank holds is?
    a. 100 litres
    b. 178 litres
    c. 288 litres
    d. 450 litres

10. An oil tank holds 225 litres. When the tank is 5/8 full, the number of litres of oil in the tank is?
    a. 141 litres
    b. 156 litres
    c. 184 litres
    d. 215 litres

Section B

1. To floor a small building required 275 boards each 2 inches thick by 12 inches wide by 12 feet long. How many board feet should be ordered? *(Lumber is usually measured in board feet. A board foot of lumber is a piece one foot square and one inch thick. To calculate board feet, multiple the thickness in inches by the width in feet by the length in feet. Count any thickness less than one inch as one inch.)*
    a. 2750 board feet
    b. 6600 board feet
    c. 8350 board feet
    d. 10,000 board feet

2. The load limit of a flatbed trailer is posted at 5 tons. Several large pieces of equipment that have their weight tagged by the manufactures have been loaded onto the truck. The tags show 3,850 pounds, 375 pounds, 1550 kilograms, and 2973 pounds. What is the total weight (in kg) of all the equipment loaded onto the trailer? (1 ton = 2000 lbs and 1 kg = 2.5 lbs)
    a. 3,850.33 kg
    b. 1,375.9 kg
    c. 4,429.2 kg
    d. 2,225.850 kg

3. Tongue and grooved flooring must always be blind (hidden nailed). To accomplish this, a builder may use wire nails which must be spaced 10 inches apart. How many nails will be needed for three lengths of 12 feet flooring?
    a. 12 nails
    b. 28 nails
    c. 36 nails
    d. 42 nails

4. A 220 volt air conditioner drawing 15 amperes of current operates 10 hours a day. The total cost of operation for four weeks at the rate of 4¢ per kilowatt hour would be:
    a. $18.48
    b. $55.44
    c. $26.40
    d. $36.96

5. The distance between Prince George and Edmonton is 737 kms. A trucker driving from Prince George to Edmonton drove for the first 100 kms at one speed and then increased their driving speed by 5 km/hr and drove the rest of the way at the higher speed. If 90 km/hr was the initial speed, then the total traveling time in hours is:
    a. 5.33 hours
    b. 7.82 hours
    c. 7.37 hours
    d. 4.88 hours

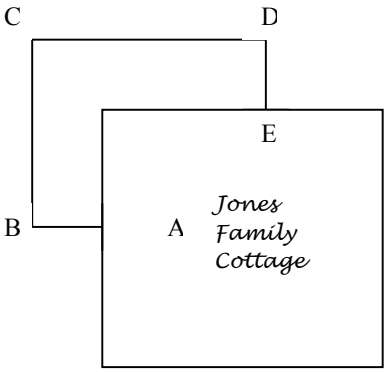
6. A client wants to increase the size of their office by 25%. If their present office is 20m x 10m, how big will their new office be?
    a. 35m x 20m
    b. 25m x 10m
    c. 15m x 20m
    d. 50m x 20m

7. A contractor calculates 35% labour, 45% material and 20% miscellaneous expenses. What is the material cost, if the labour cost is $385.00? How much will the contractor estimate the project will cost?
    a. $500
    b. $750
    c. $1,100
    d. $2,560

8. Nine large pipes will drain a pond in eight hours and six small pipes will drain the same pond in sixteen hours. How long will it take 3 large pipes and 5 small pipes to drain the pond?
    a. 3 hours and 50 minutes
    b. 14 hours and 15 minutes
    c. 12 hours and 20 minutes
    d. 10 hours and 40 minutes

9. Many farmers in dryland farming areas use circular irrigation systems. A single sprinkler is placed on the center of the field. If the sprinkler sprays water just to the four edges of the field what percent of the field is not watered?
    a. 21.5%
    b. 33%
    c. 15.5%
    d. 25%

10. The Jones family wants to build a deck on their lake cottage. The architect drew a diagram for them which shows it built on the corner of a cottage. A railing is to be constructed around the four outer edges of the deck. If AB = DE, BC = CD and the length of the railing is 30 meters, then what dimensions will give maximum area?



a. 3.5m * 7m * 7m * 3.5m
b. 5m * 10m * 10m * 5m
c. 5m * 5m * 5m * 5m
d. 30m * 5m * 30m * 5m

Section C

1. Find exact value of $\cos \frac{\pi}{4}$

a. $1/\sqrt{2}$
b. $\sqrt{2}$
c. 1
d. $\sqrt[2]{3}$

2. As a general contractor you need to order replacement sod to return a worksite to its pre-project condition. The area you need to cover is 60 feet long and 20 feet wide. Sod comes in squares that are 18" on a side and can only be ordered in pallets of 50. How many pallets will you need to order to complete the restoration?
   a. 10 pallets
   b. 11 pallets
   c. 12 pallets
   d. 13 pallets

3. If a car goes from 10 m/s to a full stop, then its change in velocity is 10 m/s. If it decelerates at a rate of 2.5 m/s^2, it will take 4s to stop. How far will this car travel when braking to a stop?
   a. 2 meters
   b. 12 meters
   c. 20 meters
   d. 22 meters

4. Force as a vector has what properties?
    a. value, pitch
    b. height, width
    c. magnitude, direction
    d. velocity, force

5. On a warm summer night (30°C) you hear a clap of thunder about 3 seconds after you see the flash of lightning associated with it. Approximately how far away did the lightning strike? (Vsound = 331 + 0.6T)
    a. 3350 m or about 3 km
    b. 1050 m or about 1 km
    c. 2500 m or about 2 km
    d. 1500 m or about .5 km

6. Use Ohm's law (I = V/R) to determine the current flowing through your body if you are accidentally electrocuted. You can assume a voltage of 120V and a resistance of 100 Ω.
    a. 0.2A
    b. 2.2A
    c. 1.0A
    d. 1.2A

7. A resistor has a power of 12.5 watts. How much voltage is there if its resistance is 2 Ω?

    a. 5 volts
    b. 15 volts
    c. 15.5 volts
    d. 17 volts

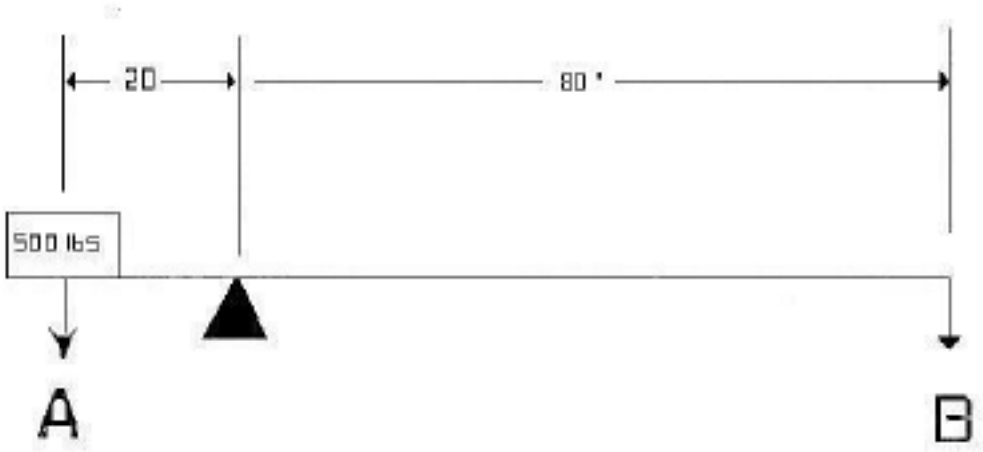
8. A machinist needs to use two shims with a combined thickness of 0.084 inches. One shim is to be three times as thick as the other. What are the thicknesses of the shims?
    a. 0.002 in. and 0.45 in.
    b. 1.34 in. and 0.06 in.
    c. 0.34 in. and 0.0563 in.
    d. 0.021 in. and 0.063 in.

9. A rectangle is 12 ft x 5 ft. Calculate its diagonal.
    a. 16 ft
    b. 12 ft
    c. 13 ft
    d. 17 ft.

10. The length of a rectangle is 4 metres longer than its width and its area is 10 square meters. What is the width of the rectangle?
    a. $\sqrt{5/2}$
    b. $\sqrt{2}$
    c. 2
    d. 5/2

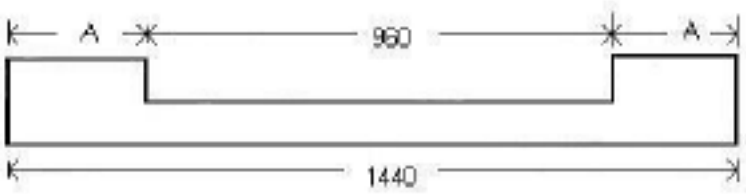
Section D

1. How many pounds are needed at "B" to balance the 500 lbs at "A"?



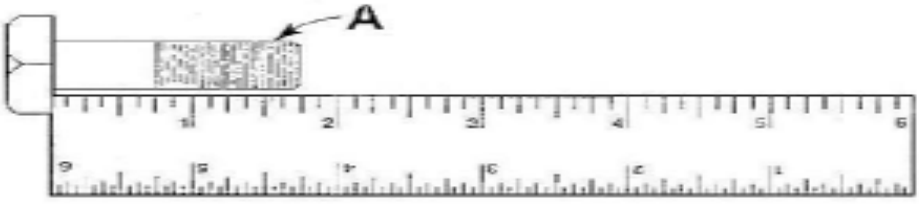
a) 62.5 lbs b) 117 lbs c) 125 lbs d) 500 lbs

2. What is the missing dimension of A in the illustration below?



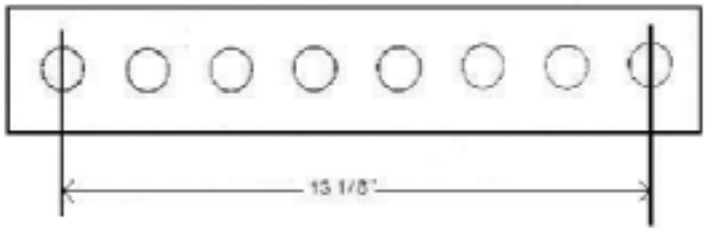
a. 480
b. 240
c. 420
d. 840

3. In the illustration below, the length of bolt "A" is



a. ¾"
b. 1 ¼"
c. 1 ½"
d. 1 ¾

4. Eight equally spaced holes are to be drilled as shown. What is the distance between these holes centre to centre? (Reduce your answer to the lowest term possible).

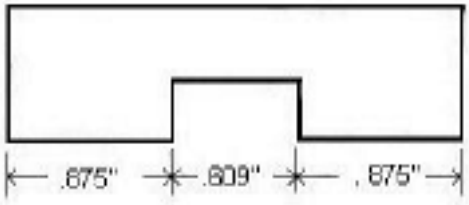


a. 1 5/8” b. 1 7/8” c. 1 6/7” d. 2 7/8”

5. When liquids or gases are heated, they

a. Shrink in volume and become less dense
b. Shrink in volume and become more dense
c. Expand in volume and become more dense
d. Expand in volume and become less dense
e. Stay the same there is no change

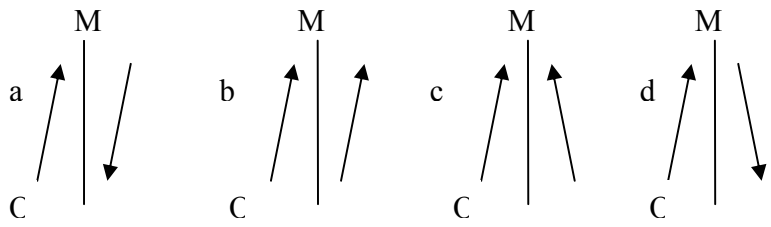
6. The overall length of this object measured in decimal fractions of an inch is



a. 0.2349
b. 0.2359
c. 2.255
d. 2.359

7. An object travels for 8.00 seconds with an average speed of 160 metres per second. The distance traveled by the object is
   a. 20 m
   b. 200 m
   c. 1280 m
   d. 2560 m

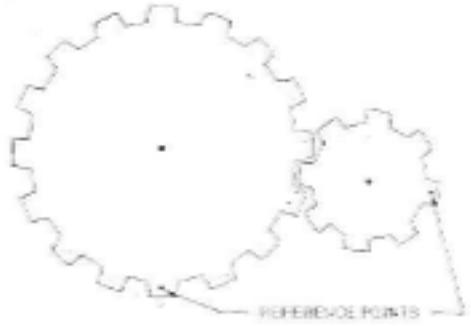
8. Which diagram best represents the reflection of an object 0 by plane mirror M?



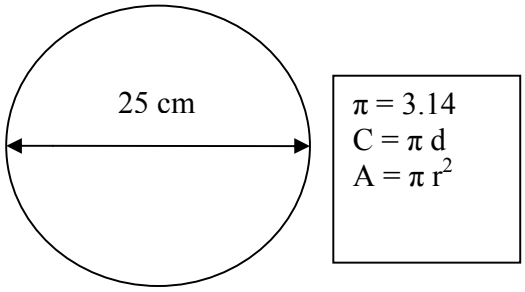
9. Some metric measures of length are: (1) metre, (2) centimetre, (3) kilometre, (4) millimetre. In increasing order of length, the correct order for listing these units is

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

10. For every four revolutions of the large gear, the small gear will turn
    a. 2 times b) 4 times c) 8 times d) 16 times e) 32 times



<u>To answer the following questions refer to the circle illustrated below, and the formulas</u>



11. The radius of the circle is

    a. 12.5 cm b) 125 cm c) 500 cm d) 750 cm e) 300 cm

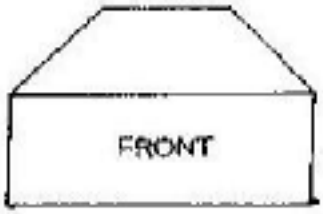
12. The circumference of the circle is

    a. 38.25 cm b) 39.25 cm c) 78.50 cm d) 79.50 cm e) 80 cm
    b.

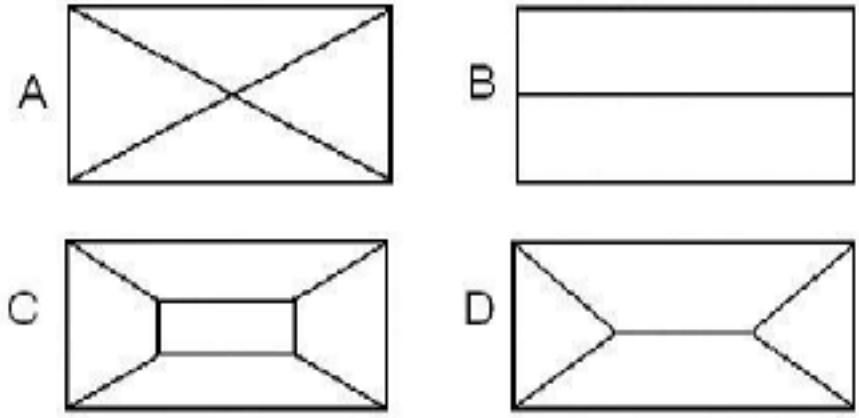
13. The area of the circle is

    a. 500.5 cm^2 b) 490.6 cm^2 c) 780.5 cm^2 d) 1490.6 cm^2 e) 1236.7 cm^2

- The front and right side views of an object are



14. Therefore which of the following illustrates the top view?
    a. A b. B c. C d. D



Apprenticeship Aptitude Test Key

TEST SECTION			
LANGUAGE SKILLS			
Vocabulary			
Question 1	D	Question 6	C
Question 2	B	Question 7	D
Question 3	C	Question 8	B
Question 4	A	Question 9	D
Question 5	C	Question 10	A
Reading Comprehension #1			
Question 1	B	Question 4	D
Question 2	A	Question 5	A
Question 3	C	Question 6	B
Reading Comprehension #2			
Question 1	A	Question 4	C
Question 2	D	Question 5	B
Question 3	A	Question 6	D
APPLIED MATH & SCIENCE SKILLS			
Section A			
Question 1	D	Question 6	D
Question 2	B	Question 7	C
Question 3	D	Question 8	B
Question 4	A	Question 9	C
Question 5	A	Question 10	A
Section B			
Question 1	B	Question 6	B
Question 2	C	Question 7	C
Question 3	D	Question 8	D
Question 4	D	Question 9	A
Question 5	B	Question 10	B
Section C			
Question 1	A	Question 6	D
Question 2	B	Question 7	A
Question 3	C	Question 8	D
Question 4	C	Question 9	C
Question 5	B	Question 10	A
Section D			
Question 1	C	Question 8	C
Question 2	B	Question 9	D
Question 3	D	Question 10	C
Question 4	B	Question 11	A
Question 5	D	Question 12	C
Question 6	D	Question 13	B
Question 7	C	Question 14	D