ENGINE CADET MODEL QUESTION PAPER

Note:

Please note that you will find sample question/previous years questions below. Each section will have a sample of 30 questions so as to give you an idea. Correct answers are highlighted or specified below the question for your reference.

Section A: Maritime Engineering Knowledge

1.What is the distinctive feature of the sealing arrangement for ball valves?

A. No valve seat

B. Valve seat in pairs – one facing inlet side and one facing outlet side

C. One valve seat sealing both inlet and outlet sides

D. Face to face metal sealing.

2. The mechanical seal of centrifugal sea water pump is lubricated by –

A. Grease

B. Silicon compound

C. Lubrication not required.

D. Sea Water from discharge side of the pump.

3. The definition of portable fire extinguisher is -

A. able to be carried by one person

B. able to be carried by 2 persons.

C. it should be wheel mounted.

D. maximum allowable weight of the extinguisher is 23 kgs.

4. Why should combustion blowers left running for while after firing a boiler?

A. To cool the burner

B. To remove the combustible vapours.

C. To cool the steam and reduce the pressure.

D. None

5. In a Sea Water cooled J.C.W. cooler, the most common cause for loss in cooling efficiency of the heater is:

A. Scale formation on J.C.W. side

B. Mud/silt deposits on J.C.W. side

C. Scale formation on S.W. side

D. None of the above

6. When running TWO centrifugal Pumps in series, discharge pressure is increased.

A. True

B. False

C. May Be

D. I don't know.

7. You are fighting a fire in the electrical switchboard in the engine room.

A. use a portable foam extinguisher.

B. use fire hose

C. use a portable CO2 extinguisher.

D. use ER fixed firefighting system

8. High salinity in distillate of freshwater generator is reduced by -

A. increasing shell temp

B. reducing the SW flow.

C. reducing the Jacket Water flow.

D. automatic recirculation of the distillate to the freshwater generator

9. Hot work onboard is allowed

A. at designated area only

B. to be done by shore w/shop only.

C. by Permit To work system.

D. None of the above

10. What does desludging water do to the running purifier?

A. prevents overflow.

B. cools purifier running parts.

C. opens purifier bowl.

D. removes the separated water and impurities.

21. An example of high-speed positive displacement pump is

A. Double unit reciprocating bilge pump

B. Heavy duty centrifugal pump

C. screw pump

D. all of the above

22. The automatic shut off of fuel to the auxiliary boiler flame failure is due to

A. air supply to boiler being shut off

B. flame failure

C. low feed water level

D. low fuel pressure

23. Mho is a unit of -

A. resistance

B. conductance

C. capacitance

D. inductance

24. In Modern 4-stroke medium speed marine diesel engine, Rotocaps are provided for

A. Rotating Nozzle rings

B. Adjust Tappet clearance.

C. Rotating exhaust valve spindles

D. Rotating piston rings for even wear down.

25. Cylinder heads of marine diesel engines are provided with _____ to relieve any excessive pressure within the combustion chamber

A. Safety valves

B. Indicator cocks

C. Relief valves

D. Bursting discs

26.For a 2-stroke engine with exhaust valves—

A. Scavenge ports closes before exhaust valve

B. Exhaust valves close before scavenging ports

C. Scavenge and exhaust valves close at same time before BDC

D. Scavenge and exhaust valves close at same time after BDC.

27. Springs are used to re-seat which one of these diesel engine components

A. cam followers

B. push rods

C. rocker arms

D. intake valves

28. One of the following also serves as a passage for lubricating oil

A. Banjo bolt

B. Pinching screw

C. Castle nut

D. Grub screw

29. Before starting work on an Air Conditioning or Provision Ref system

A. It is necessary to run the compressor and pack the refrigerant in the condenser.

B. It is necessary to run the compressor and pack the refrigerant in the evaporator.

C. No need to pack the refrigerant as the system has isolation valves in the refrigerant line.

D. None of the above

30. The elevated walkway on ships which serves as a safe access between the accommodation spaces and the forecastle is called

A. Bulwalk

B. Catwalk

C. Bulkhead

D. Bulwark

Section B: Maths, Aptitude and English

EC-B-01

1. The number of prime factors in the expressions $6^4 \times 8^6 \times 10^8 \times 12^{10}$ is:

A. ○ **80**

B. ○ **64**

C. ○ **72**

D. ○ **48**

Answer & Solution | Discuss in Board | Save for Later

Answer & Solution

Answer: Option C

Solution:

$6^4 \times 8^6 \times 10^8 \times 12^{10}$

$= (2 \times 3)^4 \times (2^3)^6 \times (2 \times 5)^8 \times (2^2 \times 3)^{10}$

$= 2^4 \times 3^4 \times 2^{18} \times 2^8 \times 5^8 \times 2^{20} \times 3^{10}$

$= 2^{50} \times 3^{14} \times 5^8$

Thus, the total prime factors,

$= 50 + 14 + 8$ **[By adding maximum power of prime factors.]**

$= 72$

EC-B-02

5. **A student scores 55% marks in 8 papers of 100 marks each. He scores 15% of his total marks in English. How much does he score in English ?**

A. ○ **44**

B. ○ **45**

C. ○ **66**

D. ○ **77**

E. ○ **None of these**

Answer & Solution | Discuss in Board | Save for Later

Answer & Solution

Answer: Option C

Solution:

Total marks obtained by the student

= 55% of 800

$= \frac{55}{100} \times 800$

= 440

∴ Marks scored in English

= 15% of 440

$= \frac{15}{100} \times 440$

= 66

EC-B-03

46. A single reservoir supplies the petrol to the whole city, while the reservoir is fed by a single pipeline filling the reservoir with the stream of uniform volume. When the reservoir is full and if 40, 000 litres of petrol is used daily, the supply fails in 90 days. If 32, 000 litres of petrol used daily, it fails in 60 days. How much petrol can be used daily without the supply ever failing?

A. ○ **64000 litres**

B. ○ **56000 litres**

C. ○ **60000 litres**

D. ○ **78000 litres**

E. ○ **None of these**

Answer & Solution | Discuss in Board | Save for Later

Answer & Solution

Answer: **Option B**

Solution:

Let X litres be the per day filling and L litres be the capacity of the reservoir, then

90X + L = 40000 × 90 ---------- (1)

60X + L = 32000 × 60 ---------- (2)

Solving the equation,

X = 56000 litres

Thus, 56000 litres per day can be used without the failure of supply.

EC-B-04

42. The sum of two numbers is 37 and the difference of their squares is 185, then the difference between the two numbers is :

A. ○ **10**

B. ○ **4**

C. ○ **5**

D. ○ **3**

Answer & Solution | Discuss in Board | Save for Later

Answer & Solution

Answer: Option C

Solution:

Let the numbers be a and b, where a > b

According to the question,

$a+b=37 \& a^2-b^2=185$

$\Rightarrow (a+b)(a-b)=185$

$\Rightarrow 37(a-b)=185$

$\Rightarrow a-b=\frac{185}{37}$

$\Rightarrow a-b=5$

EC-B-05

61. The sum of the numerator and denominator of a fraction is 11. If 1 is added to the numerator and 2 is subtracted from the denominator, it becomes $\frac{2}{3}$. The fraction is :

A. ○ $\frac{5}{6}$

B. ○ $\frac{6}{5}$

C. ○ $\frac{3}{8}$

D. ○ $\frac{8}{3}$

Answer & Solution | Discuss in Board | Save for Later

Answer & Solution

Answer: Option C

Solution:

Let the fraction be $\frac{x}{y}$

Then,

$\Leftrightarrow x + y = 11$.....(i)

$\Leftrightarrow \frac{x+1}{y-2} = \frac{2}{3}$

$\Leftrightarrow 3(x+1) = 2(y-2)$

$\Leftrightarrow 3x - 2y = -7$.....(ii)

Solving (i) and (ii), we get:

x = 3 and y = 8

So, the fraction is $\frac{3}{8}$

EC-B-06

22. A pipe can fill a tank in 3 hours. There are two outlet pipes from the tank which can empty it in 7 and 10 hours respectively. If all the three pipes are opened simultaneously, then the tank will be filled in -

A. ○ **8 hours**

B. ○ **9 hours**

C. ○ **10 hours**

D. ○ **11 hours**

Answer & Solution | Discuss in Board | Save for Later

Answer & Solution

Answer: Option D

Solution:

Net part filled in 1 hour

$$= \frac{1}{3} - \left(\frac{1}{7} + \frac{1}{10}\right)$$

$$= \frac{1}{3} - \frac{17}{70}$$

$$= \frac{19}{210}$$

$\therefore$ The tank will be filled in $\frac{210}{19}$ hours i.e.

$$= 11\frac{1}{19} \text{ hours}$$

$$\cong 11 \text{ hours}$$

EC-B-07

20. A watch becomes fast by 5 minutes everyday. By what percent does it become fast ?

A. ○ $\frac{5}{24}\%$

B. ○ $\frac{1}{12}\%$

C. ○ **5 %**

D. ○ $\frac{50}{144}\%$

Answer & Solution | Discuss in Board | Save for Later

Answer & Solution

Answer: Option D

Solution:

Number of minutes in a day

= (24 × 60) = 1440

∴ Required percentage

$= \left(\frac{5}{1440} \times 100\right)\%$

$= \frac{50}{144}\%$

EC-B-08

4. A man can swim in still water at 4.5 km/h, but takes twice as long to swim upstream than downstream. The speed of the stream is?

A. 3 **B.** 7.5

C. 2.25 **D.** 1.5

View Answer Workspace Report Discuss

Answer & Explanation

Answer: Option D

Explanation:

M = 4.5

S = x

DS = 4.5 + x

US = 4.5 + x

4.5 + x = (4.5 - x)2

4.5 + x = 9 -2x

3x = 4.5

x = 1.5

EC-B-09

24. A train leaves Delhi at 9 a.m. at a speed of 30 kmph. Another train leaves at 2 p.m. at a speed of 40 kmph on the same day and in the same direction. How far from Delhi, will the two trains meet?

A. 300 km **B.** 400 km

C. 600 km **D.** None

View Answer Workspace Report Discuss

Answer & Explanation

Answer: Option C

Explanation:

D = 30 * 5 = 150

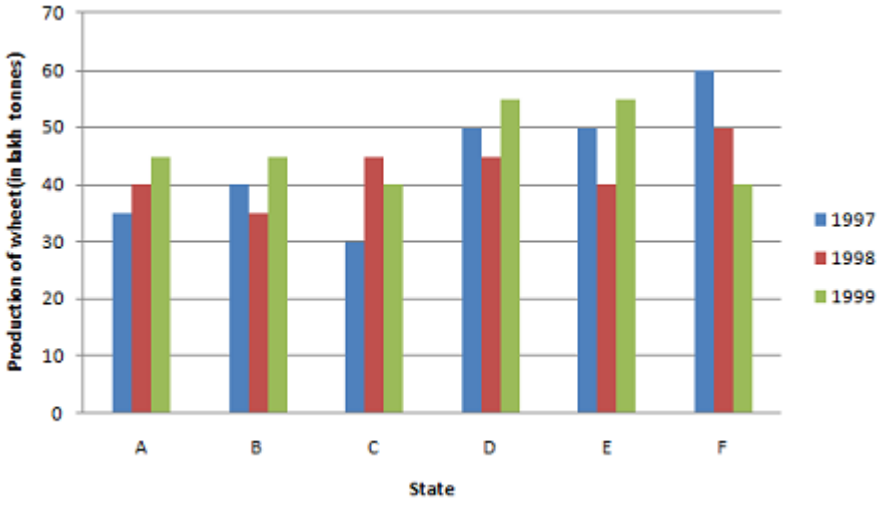
RS = 40 " 30 = 10

T = 150/10 = 15

D = 40 * 15 = 600 km

EC-B-10

The graph shows the production of wheat in 6 states in 1997,1998 and 1999. Study the graph and answer these questions



What is the ratio of minimum production and maximum production in any of the given states in any of the given years?

A. 1:2 **B.** 2:3

C. 1:3 **D.** 3:4

View Answer Workspace Report Discuss

Answer & Explanation

Answer: Option A

Explanation:

Minimum production = 30 lakh tones (C in 1997) Maximum production = 60 lakh tones (F in 1997) Required ratio = 30:60 = 1:2.

EC-B-11

20. She is so ---------- that she easily catches cold.

A. sober **B.** sincere

C. sensitive **D.** sensible

View Answer Workspace Report Discuss

Answer & Explanation

Answer: Option C

Explanation:

EC-B-12

36. To be up to one's neck in something

A. to have a lot of something to deal with

B. to win a race by a short distance

C. to be shouted at for something one has done

D. to feel very nervous and frightened

E. to give oneself the courage or strength to do something

View Answer Workspace Report Discuss

Answer & Explanation

Answer: Option A

Explanation:

'To be upto your neck in something' means 'to have a lot of something to deal with'.

EC-B-13

It is dangerous to enter -------- the enemy's camp.

A. in

B. on

C. by

D. into

View Answer Workspace Report Discuss

Answer & Explanation

Answer: Option D

Explanation:

EC-B-14

17. When it began to rain suddenly on the first of January

P : to celebrate the new year

Q : we ran for shelter

R : to the neighbouring house

S : where many people had gathered

The Proper sequence should be:

A. ○ QRPS

B. ○ PSQR

C. ○ PRSQ

D. ○ QRSP

Answer & Solution | Discuss in Board | Save for Later

Answer & Solution

Answer: Option D

Solution:

When it began to rain suddenly on the first of January we ran for shelter to the neighbouring house where many people had gathered to celebrate the new year.

Comprehension Passage:

The **rivers of India** play an important role in the lives of the Indians. They provide potable water, cheap transportation, electricity, and the livelihood for a large number of people all over the country. This easily explains why nearly all the major cities of India are located by the banks of rivers. The rivers also have an important role in Hindu Religion and are considered holy by all Hindus in the country.

Seven major rivers along with their numerous tributaries make up the river system of India. The largest basin system of the rivers pours their waters into the Bay of Bengal; however, some of the rivers whose courses take them through the western part of the country and towards the east of the state of Himachal Pradesh empty into the Arabian Sea. Parts of Ladakh, northern parts of the Aravalli range and the arid parts of the Thar Desert have inland drainage.

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All major rivers of India originate from one of the following main watersheds:

1. Aravalli range
2. Himalaya and Karakoram ranges
3. Sahyadri or Western Ghats in western India
4. Vindhya and Satpura ranges

Himalayan glaciers in the Indian subcontinent are broadly divided into the three river basins, namely the Indus, Ganga and Brahmaputra. The Indus basin has the largest number of glaciers (3500), whereas the Ganga and Brahmaputra basins contain about 1000 and 660 glaciers, respectively. Ganga is the largest river system in India. However these rivers are just three among many. Other examples are Narmada, Tapi, and Godavari.

EC-B-15

Q1. According to the passage, the major rivers in India

a) Pour only into Bay of Bengal

b) Pour only into Arabian Sea

c) Pour either into Bay of Bengal or Arabian Sea or have inland drainage

d) Pour either into Bay of Bengal or Arabian Sea

EC-B-16

Q2. How many glaciers are there in each of the river basins in India?

a) Brahmaputra, Ganga, Indus – 1000, 660, 3500 respectively

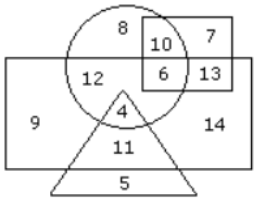
b) Indus, Brahmaputra, Ganga – 1000, 660, 3500 respectively

c) Ganga, Indus, Brahmaputra – 1000, 660, 3500 respectively

d) Ganga, Brahmaputra, Indus – 1000, 660, 3500 respectively

EC-B-17

In the following diagram rectangle represents men, Triangle represents educated, Circle represents urban and square represents government employees.



Which one of the following represents the educated men but not urban ?

A. 9

B. 5

C. 4

D. 11

Answer: Option **D**

Explanation:

No answer description available for this question. Let us discuss.

View Answer Discuss in Forum Workspace Report

EC-B-18

Rahul put his timepiece on the table in such a way that at 6 P.M. hour hand points to North. In which direction the minute hand will point at 9.15 P.M. ?

A. South-East

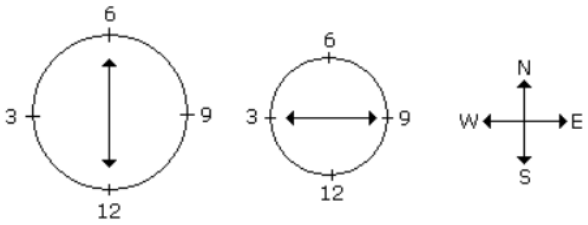
B. South

C. North

D. West

Answer: Option **D**

Explanation:

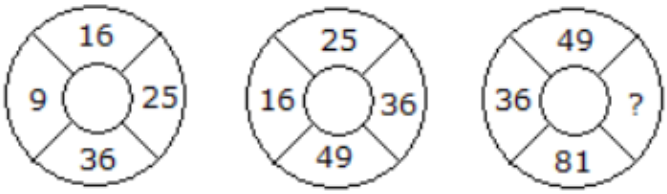


At 9.15 P.M., the minute hand will point towards west.

View Answer | Discuss in Forum | Workspace | Report

EC-B-19

Which one will replace the question mark ?



A. 64

B. 144

C. 169

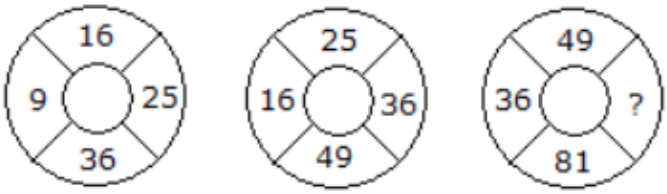
D. 25

Answer: Option **A**

Explanation:

EC-B-20

Which one will replace the question mark ?



A. 64

B. 144

C. 169

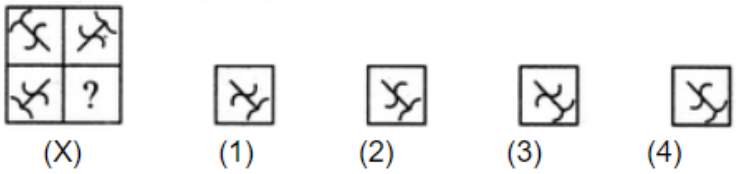
D. 25

Answer: Option **A**

Explanation:

EC-B-21

Identify the figure that completes the pattern.



A. 1

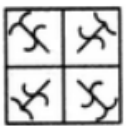
B. 2

C. 3

D. 4

Answer: Option **D**

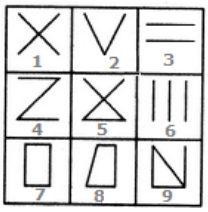
Explanation:



View Answer Discuss Workspace Report

EC-B-22

Group the given figures into three classes using each figure only once.



A. 1,2,3 ; 4,5,6 ; 7,8,9

B. 1,3,5 ; 2,4,6 ; 7,8,9

C. 1,5,9 ; 3,6,2 ; 4,7,8

D. 1,9,7 ; 2,8,5 ; 3,4,6

Answer: Option **A**

Explanation:

1, 2, 3 are figures composed of two straight lines.

4, 5, 6 are figures composed of three straight lines.

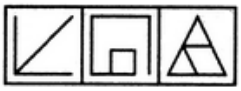
7, 8, 9 are figures composed of four straight lines.

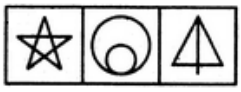
View Answer Discuss Workspace Report

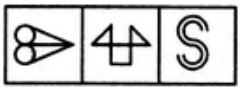
EC-B-23

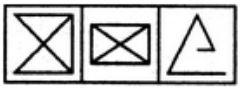
Choose the set of figures which follows the given rule.

Rule: Any figure can be traced by a single unbroken line without retracting.

(1) 

(2) 

(3) 

(4) 

A. 1

B. 2

C. 3

D. 4

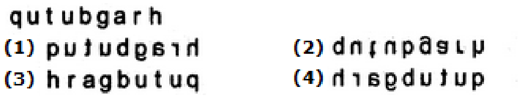
Answer: Option **B**

Explanation:

View Answer Discuss Workspace Report

EC-B-24

Choose the alternative which is closely resembles the mirror image of the given combination.



A. 1

B. 2

C. 3

D. 4

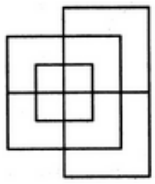
Answer: Option **D**

Explanation:

View Answer Discuss Workspace Report

EC-B-25

Find the minimum number of straight lines required to make the given figure.



A. 13

B. 15

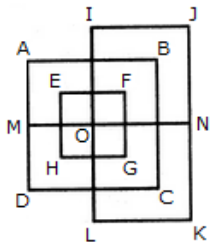
C. 17

D. 19

Answer: Option **A**

Explanation:

The figure may be labelled as shown.



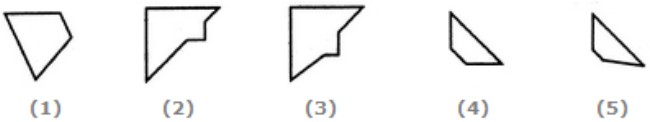
The horizontal lines are IJ, AB, EF, MN, HG, DC and LK i.e. 7 in number.

The vertical lines are AD, EH, IL, FG, BC and JK i.e. 6 in number.

Thus, there are 7 + 6 = 13 straight lines in the figure.

EC-B-26

Select the alternative which represents three out of the five alternative figures which when fitted into each other would form a complete square.



A. 123

B. 234

C. 134

D. 345

Answer: Option **D**

Explanation:

View Answer Discuss Workspace Report

EC-B-27

Choose the box that is similar to the box formed from the given sheet of paper (X).

A. 1 only

B. 1 and 3 only

C. 1, 3 and 4 only

D. 1, 2, 3 and 4

Answer: Option **A**

Explanation:

View Answer Discuss Workspace Report

EC-B-28

Choose the box that is similar to the box formed from the given sheet of paper (X).

A. 1 and 2 only

B. 2, 3 and 4 only

C. 4 only

D. 3 and 4 only

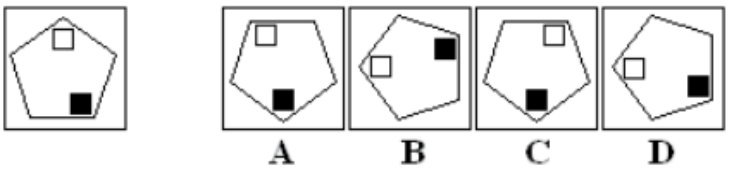
Answer: Option **D**

Explanation:

View Answer Discuss Workspace Report

EC-B-29

Which figure is identical to the first?

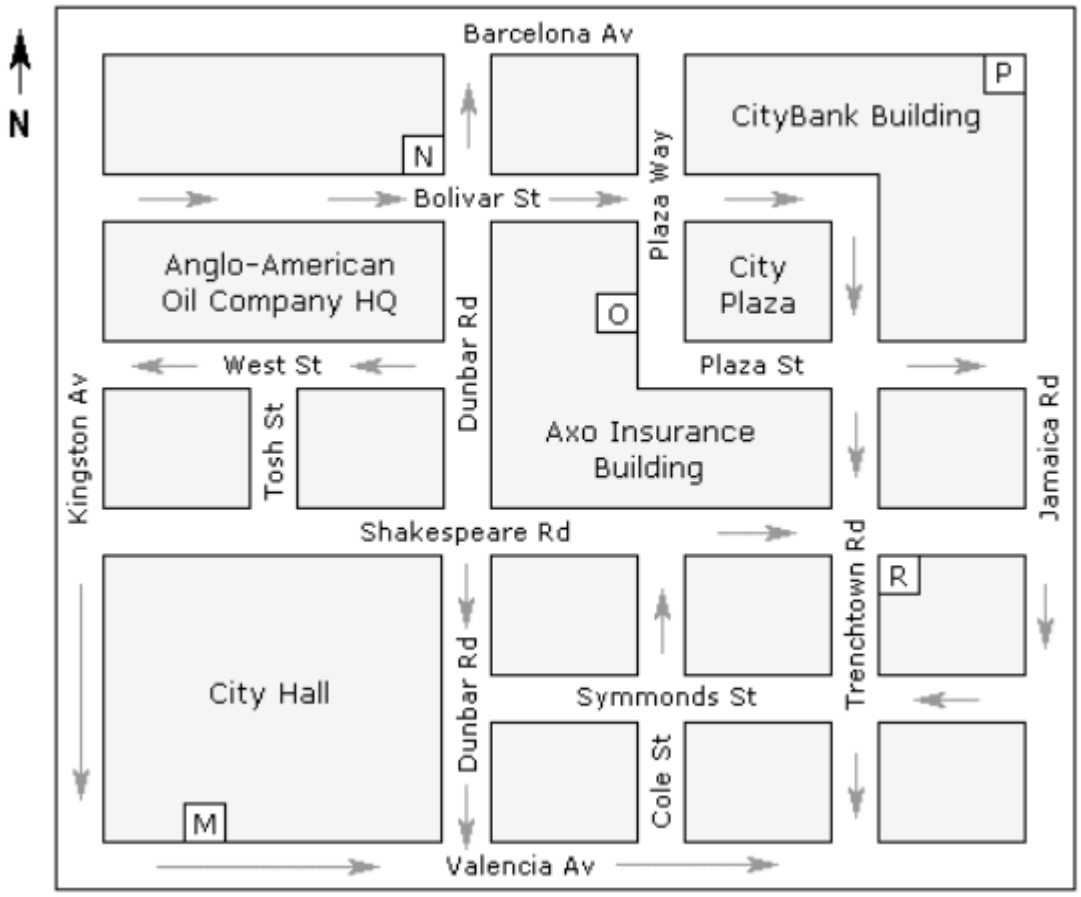


A B C D

Answer: B

EC-B-30

Direction : Below is the map of a town : North Oriented i.e., ↑ is North. Answer the following questions with respect to the map:



Officer Perez is in Tosh St with City Hall to her right. What direction is she facing?

A	B	C	D
North	South	East	West

Answer: C