भारतीय विमानपत्तन प्राधिकरण
AIRPORTS AUTHORITY OF INDIA

(SCHEDULE – 'A' MINI RATNA- CATEGORY- 1 PUBLIC SECTOR ENTERPRISES)

राजीव गांधी भवन, सफदरजंग हवाई अड्डा, नईदिल्ली- 110003
RAJIV GANDHI BHAWAN, SAFDARJUNG AIRPORT, NEW DELHI-110003

Azadi Ka Amrit Mahotsav

Participant ID	
Participant Name	
Test Center Name	iON Digital Zone iDZ 2 Sector 62
Test Date	27/07/2022
Test Time	8:30 AM - 10:30 AM
Subject	Junior Executive(ATC)

Section : **English Language**

Q.1 **Select the most appropriate ANTONYM of the underlined word.**

The police found that the victim was hit with a <u>blunt</u> weapon by the murderer.

Ans ✔ 1. Sharp

✘ 2. Curved

✘ 3. Wild

✘ 4. Dull

Question ID : **63068067218**
Status : **Answered**
Chosen Option : **1**

Q.2 **Select the most appropriate option to fill in the blank.**
I urged Seema to _____ in touch with me regularly.

Ans ✘ 1. come

✘ 2. go

✔ 3. keep

✘ 4. take

Question ID : **63068050770**
Status : **Answered**
Chosen Option : **3**

Q.3 Select the most appropriate option to fill in the blank.
A _____ is a person who remains absent from school regularly without permission.

Ans ✔ 1. truant

✘ 2. diligent

✘ 3. delinquent

✘ 4. child prodigy

Question ID : **63068050750**
Status : **Answered**
Chosen Option : **2**

Q.4 In the given sentence, four words have been underlined and the underlined words are given as options. Select the option that contains an error.

The smiling young woman walked cautious with high heels, over the freshly mopped floor of the hotel, carrying a fancy bag.

Ans ✘ 1. smiling young

✘ 2. freshly

✔ 3. cautious

✘ 4. carrying

Question ID : **63068047987**
Status : **Answered**
Chosen Option : **3**

Q.5 Select the most appropriate option to fill in the blank.
The steep _____ of the hill was a challenge to the trekkers.

Ans ✘ 1. assent

✘ 2. accident

✔ 3. ascent

✘ 4. ascend

Question ID : **63068050318**
Status : **Answered**
Chosen Option : **3**

Q.6 In the given sentence, four words have been underlined and the underlined words are given as options. Select the option that contains an error.

My conservative father has bought some heavier jewellery for my sister's grand wedding, in balmy October.

Ans ✔ 1. heavier

✘ 2. grand

✘ 3. balmy

✘ 4. conservative

Question ID : **63068047966**
Status : **Answered**
Chosen Option : **1**

Q.7 Select the most appropriate preposition to fill in the blank.

Most teenagers like Harry Potter, but _____ my opinion, it is too childish.

Ans ✔ 1. in

✘ 2. of

✘ 3. on

✘ 4. for

Q.8 Select the most appropriate article to fill in the blank.
During the fight, he was injured in _____ arm.

Ans ✘ 1. No article

✘ 2. an

✔ 3. the

✘ 4. a

Q.9 Parts of a sentence are given below in jumbled order. Identify the option that arranges the
parts in the correct order to form a meaningful sentence
(a) Many people
(b) like to spend(c) as they provide
(d) in the villages
(e) their retired lives
(f) fresh air

Ans ✘ 1. adcebf

✘ 2. acdebf

✘ 3. aebdcf

✔ 4. abedcf

Q.10 Select the most appropriate option to fill in the blank.
What did you have for _____ lunch?

Ans ✘ 1. the

✘ 2. an

✘ 3. a

✔ 4. No article required

Q.11 Of the four sentences given in the options, three form a meaningful paragraph. Identify the odd one out.

Ans ✗ 1. Surging prices of vegetables, fruits, dairy, etc. is a matter of concern.

✓ 2. Organic food is in high demand as it ensures a positive effect on general health.

✗ 3. This is simply related to the cost of production and transportation.

✗ 4. However, if we buy local produces, the burden can be lessened.

Question ID : **63068085919**
Status : **Answered**
Chosen Option : **2**

Q.12 Select the option that gives the most appropriate meaning of the underlined word.
She used her position as a minister to <u>pervert</u> the course of justice.

Ans ✗ 1. To lead properly

✗ 2. To correct

✓ 3. To turn away

✗ 4. To facilitate

Question ID : **63068050284**
Status : **Answered**
Chosen Option : **3**

Q.13 Select the option that expresses the given sentence in progressive present tense form.
Micro, Small and Medium Enterprises (MSMEs) face challenges when it comes to adopting new technologies such as Industry 4.0.

Ans ✗ 1. Micro, Small and Medium Enterprises (MSMEs) has faced challenges when it comes to adopting new technologies such as Industry 4.0.

✗ 2. Micro, Small and Medium Enterprises (MSMEs) is facing challenges when it comes to adopting new technologies such as Industry 4.0.

✗ 3. Micro, Small and Medium Enterprises (MSMEs) have been facing challenges when it comes to adopting new technologies such as Industry 4.0.

✓ 4. Micro, Small and Medium Enterprises (MSMEs) are facing challenges when it comes to adopting new technologies such as Industry 4.0.

Question ID : **63068049389**
Status : **Answered**
Chosen Option : **4**

Q.14 Select the most appropriate meaning of the given proverb.

The fat buffalo will attract the lean buffalo.

Ans ✗ 1. People run behind the thing they lack.

✗ 2. Strong people attract only weak people.

✓ 3. Successful people lead by example.

✗ 4. Weak people are exploited by strong people.

Question ID : **63068055152**
Status : **Answered**
Chosen Option : **1**

Q.15 Select the option that gives the most appropriate meaning of the underlined idiom.
The policemen in the town are <u>hand in glove</u> with the bandits.

Ans ✗ 1. Hiding hand in glove

✗ 2. Having control over

✗ 3. Trying to make up a quarrel

✓ 4. On intimate terms

Question ID : **63068054125**
Status : **Answered**
Chosen Option : **2**

Q.16 Select the option that can be used as a one-word substitute for the given group of words.
The plants and vegetation of an area

Ans ✓ 1. Flora

✗ 2. Botany

✗ 3. Fauna

✗ 4. Geography

Question ID : **63068054852**
Status : **Answered**
Chosen Option : **2**

Q.17 The following sentence has been split into four segments. Identify the segment that contains a grammatical error.
He didn't knew / where to keep his books / so he left them / lying on the table.

Ans ✓ 1. He didn't knew

✗ 2. lying on the table

✗ 3. where to keep his books

✗ 4. so he left them

Question ID : **63068050191**
Status : **Answered**
Chosen Option : **1**

Q.18 Four sentences related to a topic are given below. Three of them can be put together to form a meaningful paragraph. Select the odd one.

1. It is difficult to calculate the exact number of words.
2. If we calculate all of scientific nomenclature, this could easily double the figure.
3. Run on sentence is an ungrammatical construction in which two or more independent clauses are improperly joined without a conjunction.
4. For example, there are apparently one million insects already described in the scientific nomenclature with several million more awaiting description.

Ans ✗ 1. 2

✗ 2. 4

✗ 3. 1

✓ 4. 3

Question ID : **63068074854**
Status : **Answered**
Chosen Option : **4**

Q.19 Select the option that expresses the given sentence in the past perfect continuous tense.

Has Ramesh worked all night?

Ans ✗ 1. Has Ramesh been working all night?

✓ 2. Had Ramesh been working all night?

✗ 3. Had Ramesh worked all night?

✗ 4. Did Ramesh work all night?

Question ID : **63068050639**

Status : **Answered**

Chosen Option : **2**

Q.20 Select the option that can be used as a one-word substitute for the given group of words/phrase.
To grind or crush into fine particles

Ans ✗ 1. Polygon

✓ 2. Pulverise

✗ 3. Polaroid

✗ 4. Ponder

Question ID : **63068050758**

Status : **Answered**

Chosen Option : **2**

Section : **General Intelligence or Reasoning**

Q.1 Five girls are sitting in a row facing north. BHARTI is not adjacent to RANI or AMITA. KIRTI is not adjacent to RANI. BHARTI is adjacent to RAMA. RAMA is in the middle of the row. KIRTI is adjacent to whom out of the following?

Ans ✗ 1. RANI

✓ 2. BHARTI

✗ 3. AMITA

✗ 4. RAMA

Question ID : **63068058151**

Status : **Answered**

Chosen Option : **2**

Q.2 A certain number of people are sitting in a row, facing North. G sits second to the left of S. T sits fourth to the right of R. Only three persons sit between R and Q. Only two persons sit between P and R. S sits third to the left of Q. If no other person is sitting in the row, what is the total number of persons seated?

Ans ✗ 1. 16

✓ 2. 14

✗ 3. 13

✗ 4. 15

Question ID : **63068057379**

Status : **Answered**

Chosen Option : **2**

Q.3 This question has two statements followed by two conclusions numbered I and II. You have to take the given statements to be true even if they seem to be at variance from commonly known facts. You have to decide which conclusion/s logically follow/s from the given statements.
Statements:
Some pinks are rats.
All ears are rats.
Conclusions (I): Some rats are ears.
Conclusions (II): Some rats are pinks.

Ans ✘ 1. Only conclusion (II) follows.

✘ 2. Neither conclusion (I) nor (II) follows.

✔ 3. Both conclusions (I) and (II) follow.

✘ 4. Only conclusion (I) follows.

Question ID : **63068083926**
Status : **Answered**
Chosen Option : **3**

Q.4 Read the given information and answer the question(s) that follow(s).
In a certain code language, 'Sit Stand Tall' is written as 'TEX OPT REF', 'Height Tall Dwarf' is written as 'DIS REF REA' and 'Dwarf Sit Weight is written as 'OPT DIS CON'.
How will 'Sit' be written in that language?

Ans ✔ 1. OPT

✘ 2. TEX

✘ 3. DIS

✘ 4. REF

Question ID : **63068059281**
Status : **Answered**
Chosen Option : **1**

Q.5 This question is based on the following words.
WALK MINT TALL BARE
If the first letter of each word is removed, which of the following will form new meaningful English words?

Ans ✘ 1. Bare and Walk

✘ 2. Tall and Mint

✔ 3. Tall and Bare

✘ 4. Mint and Bare

Question ID : **63068049329**
Status : **Answered**
Chosen Option : **3**

Q.6 Seven friends G, H, I, J, K, L and M are sitting around a circular table, facing away from the centre. J is sitting fourth to the left of G. K is sitting immediately to the left of J and immediately to the right of M. L and G are neighbours of H, who is sitting second to the left of M.
Who is sitting second to the left of K?

Ans ✗ 1. J

✔ 2. G

✗ 3. I

✗ 4. H

Question ID : **63068048430**
Status : **Answered**
Chosen Option : **4**

Q.7 Seven persons A, B, C, D, E, F and G are sitting around a circle for playing cards, facing towards the centre. C is sitting immediately to the left of G and D is sitting second to the left of C.B is sitting third to the right of A and F is sitting second to the left of A.
Who is sitting third to the right of C?

Ans ✗ 1. D

✗ 2. F

✔ 3. E

✗ 4. B

Question ID : **63068048427**
Status : **Answered**
Chosen Option : **1**

Q.8 Rahul is the nephew of Nilesh. Nilesh's mother is Rita. Sita is Rita's mother. Sita's husband is Arjun. Sushma is the mother-in-law of Arjun. How is Rahul related to Arjun?

Ans ✗ 1. Rahul is Arjun's son

✔ 2. Rahul is Arjun's great grandson

✗ 3. Rahul is Arjun's great grandson's son

✗ 4. Rahul is Arjun's grandnephew

Question ID : **63068058815**
Status : **Answered**
Chosen Option : **2**

Q.9 In this question, two statements are followed by two conclusions, numbered I and II. Find out which conclusion(s) is/are true based on the given statements.
Statements:
R > S ≥ T ≥ W, W ≥ U<M
Conclusions:
I. U < S
II. S = U

Ans ✗ 1. Only conclusion I is true.

✔ 2. Either conclusion I or conclusion II is true.

✗ 3. Both conclusions I and II are true.

✗ 4. Only conclusion II is true.

Question ID : **63068048940**
Status : **Answered**
Chosen Option : **2**

Q.10 If '−' means '+', '÷' means '×', '×' means '÷', then what will be the value of the following expression?

13 − 10 ÷ 6 × 5

Ans   ✖ 1. 27

    ✖ 2. 30

    ✔ 3. 25

    ✖ 4. 90

Question ID : **63068049074**
Status : **Answered**
Chosen Option : **3**

Q.11 Parth goes jogging 40 metres towards east from his house. He turns left and jogs for 20 metres. He then turns right and jogs for 30 metres and finally, turns southwards and jogs for another 20 metres and stops jogging. What is the shortest distance from his house to the point at which he stopped jogging?

Ans   ✖ 1. 60 metres

    ✔ 2. 70 metres

    ✖ 3. 100 metres

    ✖ 4. 20 metres

Question ID : **63068048492**
Status : **Answered**
Chosen Option : **2**

Q.12 In a certain code language, 'FOUR' is coded as 7912 and 'FROM' is coded as 1287. What will be the code for 'M' in the given code language?

Ans   ✖ 1. 2

    ✔ 2. 8

    ✖ 3. 7

    ✖ 4. 9

Question ID : **63068057808**
Status : **Answered**
Chosen Option : **2**

Q.13 Refer to the following letter, number, symbol series and answer the question that follows.

(Left) M 6 R Z Ω B % 7 K & 4 D π S Q 2 @ 3 ∞ E (Right)

Which of the given options is the seventh element to the right of B?

Ans   ✖ 1. D

    ✔ 2. π

    ✖ 3. Q

    ✖ 4. S

Question ID : **63068049817**
Status : **Answered**
Chosen Option : **2**

Q.14 Select the combination of letters that when sequentially placed in the blanks of the given series will complete the series.

P_O_M _V_SR EF_C_ _YW_U L_KJ_

Ans ❌ 1. NQUTDBVXMI

❌ 2. OPUTBDXVMI

❌ 3. QPUTDXBVMI

✅ 4. QNUTDBXVMI

Question ID : **63068060469**

Status : **Answered**

Chosen Option : **4**

Q.15 If − means +, × means − , ÷ means ×, + means ÷, then what will be the value of the following expression?

$48 \div \frac{1}{12} \times 28 + 7 = ?$

Ans ✅ 1. 0

❌ 2. 190

❌ 3. 188

❌ 4. 192

Question ID : **63068050687**

Status : **Answered**

Chosen Option : **1**

Section : **General Aptitude or Numerical Ability**

Q.1 The digit in the unit's place of 2^{30} is:

Ans ❌ 1. 8

❌ 2. 6

✅ 3. 4

❌ 4. 2

Question ID : **63068049973**

Status : **Answered**

Chosen Option : **3**

Q.2 The sales of an item (in Thousands) in different days of a week is given.
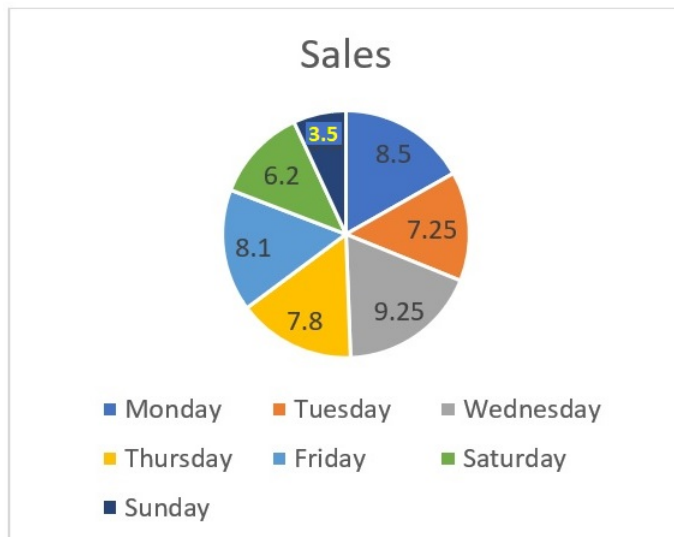
What is the angle of Wednesday on the pie chart?

Ans ✔ 1. $65.8°$

✘ 2. $68.5°$

✘ 3. $63.8°$

✘ 4. $64.5°$

Q.3 In an NCC camp, there are food provisions for 500 cadets for 60 days. If 100 more persons join the NCC camp, for how many days will the provisions last?

Ans ✘ 1. 46 days

✘ 2. 48 days

✘ 3. 44 days

✔ 4. 50 days

Q.4 A book is listed at ₹1,200 and two successive discounts of 10% and 10% are given on it. How much would the seller gain or lose if he gives a single discount of 20% instead of two discounts?

Ans ✘ 1. ₹11

✔ 2. ₹12

✘ 3. ₹24

✘ 4. ₹10

Q.5 In a frustum of a right circular cone, R = 5 cm, r = 3 cm, l = 6 cm. Calculate its curved surface area.

Ans ✔ 1. $48\pi \ cm^2$

✘ 2. $144\pi \ cm^2$

✘ 3. $96\pi \ cm^2$

✘ 4. $56\pi \ cm^2$

Q.6 A painter charges Rs.5 per sq. m. for painting any surface. Find the amount he will charge for painting a spherical ball of radius 10.5 m.

Ans ✘ 1. ₹6,468

✘ 2. ₹6,699

✘ 3. ₹7,161

✔ 4. ₹6,930

Q.7 An annual instalment of ₹2,200 will discharge a debt of ₹y due in 3 years at 14.5% simple interest per annum. What is the value of y? (Note: instalments will be paid at the end of year 1, year 2 and year 3.)

Ans ✘ 1. 7757

✔ 2. 7557

✘ 3. 7767

✘ 4. 7577

Q.8 Pipe X can fill a tank 7 times faster in comparison to pipe Y. It takes 49 minutes for pipe X and Y to fill the tank together. How much time will pipe Y alone take to fill the tank?

Ans ✔ 1. 392 minutes

✘ 2. 393 minutes

✘ 3. 391 minutes

✘ 4. 390 minutes

Q.9 The marked price of a sofa was Rs.14,200. The shopkeeper was offering it for a discount of 25%, but on further bargaining agreed to offer a successive discount and finally sold the sofa for Rs.9,585. What was the second discount offered by him?

Ans ✗ 1. 12%

✓ 2. 10%

✗ 3. 18%

✗ 4. 15%

Q.10 The sales of an item (in Thousands) in different days of a week is given.
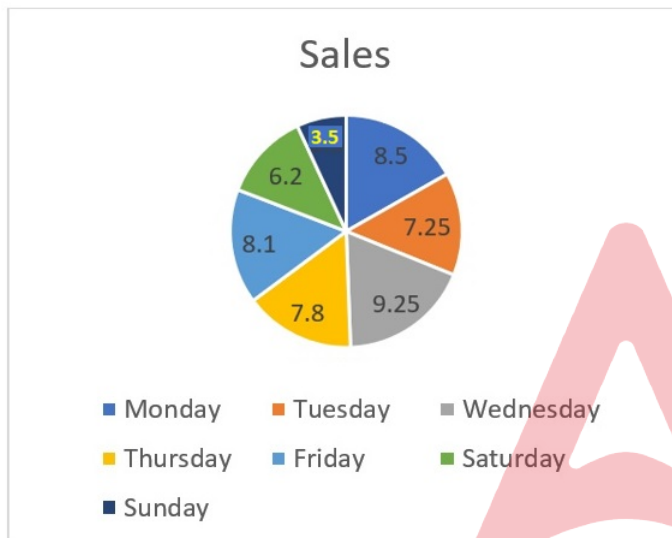
The angle difference of 2.13° is for _____ and _____.

Ans ✗ 1. ; Sunday, Saturday

✗ 2. Tuesday, Monday

✗ 3. Friday, Saturday

✓ 4. Thursday, Friday

Q.11 In an election, a candidate got 65% of the votes and won by a margin of 900 votes. Find the total number of votes.

Ans ✗ 1. 3500

✗ 2. 4000

✓ 3. 3000

✗ 4. 2500

Q.12 In a math test given to 14 students, marks out of 100 are recorded as 21, 38, 42, 56, 36, 48, 29, 44, 22, 32, 63, 64, 72, 74. Find the arithmetic mean.

Ans ✗ 1. 44.68

✓ 2. 45.78

✗ 3. 42.62

✗ 4. 49.55

Question ID : **63068061211**
Status : **Answered**
Chosen Option : **2**

Q.13 To escape, a thief runs towards a gathering at a speed of 6 km/h and a policeman chases the thief at a speed of 10 km/h. The policeman is able to catch him just before he reaches the gathering. What is the distance between the policeman and the thief, if the thief is 1.5 km away from gathering?

Ans ✗ 1. 1.25 km

✓ 2. 1 km

✗ 3. 0.75 km

✗ 4. 1.5 km

Question ID : **63068078036**
Status : **Answered**
Chosen Option : **2**

Q.14 In a division sum, the divisor is 4 times the quotient and 8 times the remainder. If the remainder is 3, then the dividend is:

Ans ✗ 1. 141

✗ 2. 96

✓ 3. 147

✗ 4. 144

Question ID : **63068050016**
Status : **Answered**
Chosen Option : **3**

Q.15 A sum of Rs.12,300 was taken as a loan. This is to be paid back in two equal annual instalments. If the rate of interest be 5% per annum, compounded annually, find the value of each instalment.

Ans ✗ 1. Rs.6,800

✗ 2. Rs.6,850

✓ 3. Rs.6,615

✗ 4. Rs.6,720

Question ID : **63068070967**
Status : **Answered**
Chosen Option : **4**

Section : **General Knowledge or Awareness**

Q.1 What is the reason for the phenomenon called 'breaks' associated with monsoon?

Ans ✗ 1. Stagnation of monsoon troughs

✗ 2. Disappearance of monsoon troughs

✗ 3. Stability of monsoon troughs

✓ 4. Movements of monsoon troughs

Question ID : **63068068548**
Status : **Answered**
Chosen Option : **2**

Q.2 As per the HDR 2020, India's HDI value stood at:

Ans ✗ 1. 0.673

✗ 2. 0.63

✓ 3. 0.645

✗ 4. 0.665

Question ID : **63068050987**
Status : **Answered**
Chosen Option : **4**

Q.3 To whom is the Dronacharya Award given in India?

Ans ✓ 1. Coach

✗ 2. Association

✗ 3. Manager

✗ 4. Player

Question ID : **63068051052**
Status : **Answered**
Chosen Option : **1**

Q.4 In which year did Christiaan Huygens put forward the wave theory of light?

Ans ✗ 1. 1681

✗ 2. 1680

✗ 3. 1675

✓ 4. 1678

Question ID : **63068051573**
Status : **Answered**
Chosen Option : **1**

Q.5 Which of the following is largest phylum of the animal kingdom?

Ans ✗ 1. Chordata

✗ 2. Annelida

✗ 3. Mollusca

✓ 4. Arthropoda

Question ID : **63068052825**
Status : **Answered**
Chosen Option : **2**

Q.6 Which of the following is NOT a qualification for appointment as a Judge of the Supreme Court?

Ans ✗ 1. He/she should have been an advocate of a High Court (or two or more such courts in succession) for at least 10 years

✓ 2. He/she should have been a High Court judge for at least 10 years

✗ 3. He/she should have been a High Court judge for at least 5 years

✗ 4. He/she should be a citizen of India

Question ID : **63068051149**
Status : **Answered**
Chosen Option : **3**

Q.7 In which year was the Microfinance Institutions Network established?

Ans ✓ 1. 2009

✗ 2. 2008

✗ 3. 2012

✗ 4. 2015

Question ID : **63068053623**
Status : **Answered**
Chosen Option : **1**

Q.8 What is the extent of the catchment area of the minor river basins in India?

Ans ✗ 1. 1500 – 2000 sq. km

✓ 2. Less than 2000 sq. km

✗ 3. 2000 – 4000 sq. km

✗ 4. 3000 – 4000 sq. km

Question ID : **63068068544**
Status : **Answered**
Chosen Option : **2**

Q.9 Who constructed the Nahargarh Fort in Jaipur?

Ans ✗ 1. Shivaji Maharaj

✓ 2. Sawai Jai Singh II

✗ 3. Rao Jodha

✗ 4. Maharaja Pratap Singh

Question ID : **63068071477**
Status : **Answered**
Chosen Option : **4**

Q.10 Who among the following was a force behind declaring Sati illegal?

Ans ✗ 1. Lord Dalhousie

✓ 2. Lord William Bentinck

✗ 3. Lord Canning

✗ 4. Lord Rippon

Question ID : **63068052796**
Status : **Answered**
Chosen Option : **2**

Section : **Discipline related**

Q.1 Suppose that X is a continuous random variable with probability density function given by:

$$f(x) = \begin{cases} \frac{x}{8}, & x \in [0,2) \\ \frac{1}{4}, & x \in [2,4) \\ -\frac{x}{8} + \frac{3}{4}, & x \in [4,6) \end{cases}$$

Find the mean of X.

Ans ✓ 1. 3

✗ 2. 5

✗ 3. 8

✗ 4. 4

Question ID : **63068099930**
Status : **Answered**
Chosen Option : **1**

Q.2 Two coils A and B are arranged parallel to each other. When the current in coil B increases at the rate of 20 A/s and initial current in coil A is zero, the induced emf in coil A is 100 V. The mutual inductance of the two coils is:

Ans ✗ 1. 7 H

✗ 2. 6 H

✓ 3. 5 H

✗ 4. 4 H

Question ID : **63680100049**
Status : **Answered**
Chosen Option : **3**

Q.3 A charge Q_1 of 3.0 μC is placed at point (36 cm, 0) and another charge Q_2 of 9.0 μC is placed at a point (0, −27 cm).

Let i and j be the unit vectors in x- and y- directions, respectively. The force exerted by Q_2 on Q_1 is:

Ans

✗ 1. −(0.96 N) i +(0.72 N) j

✗ 2. −(0.96 N) i −(0.72 N) j

✔ 3. (0.96 N) i +(0.72 N) j

✗ 4. (0.96 N) i −(0.72 N) j

Q.4

Find $\lim\limits_{x\to\frac{\pi}{4}} \dfrac{\cot^3 x - \tan x}{\cos\left(x+\frac{\pi}{4}\right)}$.

Ans

✗ 1. $\sqrt{2}$

✔ 2. 8

✗ 3. $4\sqrt{2}$

✗ 4. 4

Q.5 A parallel plate capacitor with circular plates of radius 1 m has a capacitance of 1 nF. At t = 0, it is connected for charging in series with a resistor R = 1 MΩ across a 2 V battery. Then the electric field at a point P, halfway between the centre and the periphery of the plates, after t = 10^{-3} s is.

Ans

✗ 1. 454.24 V/m

✗ 2. 0.45 V/m

✗ 3. 4.54 V/m

✔ 4. 45.42 V/m

Q.6 Consider two coaxial cylinders of same length L, with vacuum inside them. The radii of the inner solenoid and the outer solenoid are r_1 and r_2 ($> r_1$), respectively. The number of turns per unit length are n_1 and n_2 for the inner solenoid and the outer solenoid, respectively. Their mutual inductance is:

Ans

✗ 1. $4\pi\ \mu_0\ n_1\ n_2\ r_2^2\ L$

✗ 2. $\pi\ \mu_0\ n_1\ n_2\ r_2^2\ L$

✓ 3. $\pi\ \mu_0\ n_1\ n_2\ r_1^2\ L$

✗ 4. $4\pi\ \mu_0\ n_1\ n_2\ r_1^2\ L$

Question ID : **630680100000**
Status : **Answered**
Chosen Option : **1**

Q.7 A parallel plate capacitor with plate area A and plate separation d, with vacuum between the plates has a capacitance C_0.

The space between the plates is filled with two slabs of the same area but thicknesses (d/4) and (3d/4) made of material of dielectric constant 2 and 4, respectively. The capacitance of the capacitor is now:

Ans

✓ 1. $\left(\frac{16}{5}\right) C_0$

✗ 2. $\left(\frac{12}{5}\right) C_0$

✗ 3. $\left(\frac{6}{5}\right) C_0$

✗ 4. $\left(\frac{8}{5}\right) C_0$

Question ID : **63068099983**
Status : **Answered**
Chosen Option : **4**

Q.8 A cricket club has 15 members, of whom only 5 can bowl. What is the probability that in a team of 11 members at least three bowlers are selected?

Ans

✗ 1. $\dfrac{83}{91}$

✗ 2. $\dfrac{85}{90}$

✓ 3. $\dfrac{12}{13}$

✗ 4. $\dfrac{42}{45}$

Question ID : **63068099905**
Status : **Answered**
Chosen Option : **1**

Q.9 Let θ and ϕ be an acute angle such that $\sin \theta = \frac{1}{\sqrt{2}}$ and $\cos \phi = \frac{1}{3}$, the value of $\theta + \phi$ is:

Ans

✗ 1. $\left(\dfrac{\pi}{3}, \dfrac{\pi}{2}\right)$

✗ 2. $\left(\dfrac{5\pi}{12}, \dfrac{3\pi}{4}\right)$

✗ 3. $\left(\dfrac{\pi}{6}, \dfrac{\pi}{2}\right)$

✔ 4. $\left(\dfrac{7\pi}{12}, \dfrac{3\pi}{4}\right)$

Question ID : **63068099911**
Status : **Answered**
Chosen Option : **4**

Q.10 The value of $7\pi/6$ into degrees should be:

Ans

✗ 1. $135°$

✗ 2. $230°$

✗ 3. $155°$

✔ 4. $210°$

Question ID : **63068099936**
Status : **Answered**
Chosen Option : **4**

Q.11 Find the length of the vector represented by the directed line segment with initial point $P(2, -3, 4)$ and terminal point $Q(-2, 1, 1)$.

Ans

✔ 1. $\sqrt{41}$

✗ 2. $\sqrt{32}$

✗ 3. $\sqrt{43}$

✗ 4. $\sqrt{39}$

Question ID : **63068099899**
Status : **Answered**
Chosen Option : **1**

Q.12 A set of linear equations is represented by the matrix equation Ax=b. The necessary condition for the existence of a solution for this system is:

Ans

✗ 1. b must be linearly independent of the columns of A

✗ 2. Det(A)=0

✗ 3. b must be linearly dependent on the columns of A

✔ 4. A must be invertible

<div style="border:1px solid">
Question ID : **63068099966**

Status : **Answered**

Chosen Option : **1**
</div>

Q.13 A square sheet of side 5.0 cm is placed in an electric field $\mathbf{E} = (1.6 \times 10^4 \ \frac{N}{C}) \ \mathbf{i}$ such that the normal unit vector for the sheet is $[(\frac{\sqrt{3}}{2}) \mathbf{i} + (\frac{1}{2}) \mathbf{j}]$. The electric flux through the sheet is:

Ans

✗ 1. 40 N m^2 /C

✗ 2. 17.3 N m^2 /C

✔ 3. 34.6 N m^2 /C

✗ 4. 20 N m^2 /C

<div style="border:1px solid">
Question ID : **630680100008**

Status : **Answered**

Chosen Option : **3**
</div>

Q.14 Which of the following statements is/are correct?

(a) Microwaves are produced by klystron valves.

(b) Radio waves are produced by inner shell electrons when they move from one energy level to a lower energy level.

Ans

✗ 1. Both (a) and (b)

✗ 2. Only (b)

✗ 3. Neither (a) nor (b)

✔ 4. Only (a)

<div style="border:1px solid">
Question ID : **630680100019**

Status : **Answered**

Chosen Option : **1**
</div>

Q.15 Find the area bounded by the curve $y = x^2 + x + 4$, the x-axis and the ordinates x = 1 and x = 3.

Ans

✔ 1. 62/3 units

✗ 2. 46 units

✗ 3. 65/3 units

✗ 4. 61/3 units

<div style="border:1px solid">
Question ID : **63068099972**

Status : **Answered**

Chosen Option : **1**
</div>

Q.16 Suppose to obtain a diffraction pattern one student uses a violet coloured beam of light. If the student replaces violet light by green light then:

Ans

✗ 1. diffraction fringes become narrower and crowded

✔ 2. the diffraction pattern becomes broader and further apart

✗ 3. no diffraction is observed

✗ 4. diffraction pattern remains same

Q.17 A battery of EMF 6.0 V and internal resistance 1.0 Ω is connected to a resistor of 11 Ω. The terminal potential difference for the battery is:

Ans

✗ 1. 5.2 V

✗ 2. 4.5 V

✗ 3. 6.0 V

✔ 4. 5.5 V

Q.18 The ratio of the longest wavelength to the shortest wavelength ($\frac{\lambda_L}{\lambda_S}$) in Paschen series of hydrogen spectrum is:

Ans

✔ 1. $\dfrac{16}{7}$

✗ 2. $\dfrac{12}{7}$

✗ 3. $\dfrac{14}{7}$

✗ 4. $\dfrac{8}{7}$

Q.19 Find the angle between the lines $\frac{x-3}{1} = \frac{y-2}{2} = \frac{z+1}{2}$ and $\frac{x-0}{3} = \frac{y-5}{2} = \frac{z-2}{6}$.

Ans

✗ 1. $cos^{-1}\left(\frac{19}{25}\right)$

✗ 2. $cos^{-1}\left(\frac{23}{27}\right)$

✔ 3. $cos^{-1}\left(\frac{19}{21}\right)$

✗ 4. $cos^{-1}\left(\frac{17}{21}\right)$

Q.20 A long straight conductor carries a current of 5 A. The magnitude of the magnetic field at a point 20 cm from the conductor is:

Ans

✗ 1. $15~\mu T$

✗ 2. $20~\mu T$

✔ 3. $5~\mu T$

✗ 4. $10~\mu T$

Q.21 The total energy released if 47 g of ^{235}U undergoes fission (disintegration energy per event, Q = 200 MeV, Avogadro's number = 6.02 × 10^{23} nuclei/mol) is close to:

Ans

✗ 1. 1.92×10^{11} J

✔ 2. 3.85×10^{12} J

✗ 3. 7.70×10^{14} J

✗ 4. 2.42×10^{12} J

Q.22 Let A be the set $\{1, 2, 3, 4\}$. Which ordered pairs are in the relation $R = \{(a, b); a \text{ divides } b\}$?

Ans ✗ 1. $\{(1,1),(1,2),(1,3),(1,4),(2,2),(2,3),(3,1),(4,4)\}$

✔ 2. $\{(1,1),(1,2),(1,3),(1,4),(2,2),(2,4),(3,3),(4,4)\}$

✗ 3. $\{(1,1),(1,2),(1,3),(1,4),(2,3),(2,4),(3,3),(4,4)\}$

✗ 4. $\{(1,1),(1,2),(1,3),(1,4),(2,2),(2,3),(3,3),(4,4)\}$

Question ID : **63068099882**
Status : **Answered**
Chosen Option : **2**

Q.23 A battery with an internal resistance of $2 \, \Omega$ and an emf of 4.0 V is connected in series to a load resistance and the terminal voltage falls to 3.8 V. What current is flowing in the circuit, and what is the value of the load resistance?

Ans ✗ 1. 0.1 A, 28 Ω

✗ 2. 0.01 A, 280 Ω

✔ 3. 0.1 A, 38 Ω

✗ 4. 0.01 A, 380 Ω

Question ID : **630680100041**
Status : **Answered**
Chosen Option : **3**

Q.24 An object is placed on the axis of a convex mirror at a point near its pole. Its image formed by the mirror is

Ans ✗ 1. virtual and inverted

✗ 2. real and inverted

✗ 3. real and erect

✔ 4. virtual and erect

Question ID : **630680100021**
Status : **Answered**
Chosen Option : **3**

Q.25 What is the identity used to verify the vectors $\bar{a} = (1,4,-7), \bar{b} = (2,-1,4)$ and $\bar{c} = (0,-9,18)$ are coplanar?

Ans ✗ 1. $\bar{a} \times (\bar{b} \cdot \bar{c})$

✗ 2. $\bar{a} \times (\bar{b} \times \bar{c})$

✔ 3. $\bar{a} \cdot (\bar{b} \times \bar{c})$

✗ 4. $\bar{a} \cdot (\bar{b} \cdot \bar{c})$

Question ID : **63068099901**
Status : **Answered**
Chosen Option : **2**

Q.26 Let R be the set of all real numbers and a function $f: R \to R$ be defined by $f(x) = ax + b$, where a, b are constants and $a \neq 0$. Is f invertible? If it is so, find the inverse of f.

Ans

✔ 1. Inverse of f exists and $f^{-1}(x) = \dfrac{x-b}{a}$

✘ 2. f is one-to-one but not onto

✘ 3. f is onto but not one-to-one

✘ 4. Inverse of f does not exist

Q.27 The angle between the lines $\dfrac{x-4}{2} = \dfrac{y}{1} = \dfrac{z+1}{-2}, \dfrac{x-1}{4} = \dfrac{y+1}{-4} = \dfrac{z-2}{2}$ is:

Ans

✘ 1. $\dfrac{\pi}{6}$

✘ 2. $\dfrac{\pi}{4}$

✘ 3. $\dfrac{\pi}{3}$

✔ 4. $\dfrac{\pi}{2}$

Q.28 A plane electromagnetic wave travels in vacuum along z-direction. Then which of the following statements is true for the electric and magnetic field vector?

Ans

✘ 1.
The electric field (E) and magnetic field (H) lie in the x-z plane and they are mutually perpendicular.

✘ 2.
The electric field (E) and magnetic field (H) lie in the x-z plane and they are parallel to each other.

✔ 3.
The electric field (E) and magnetic field (H) lie in the x-y plane and they are mutually perpendicular.

✘ 4.
The electric field (E) and magnetic field (H) lie in the y-z plane and they are mutually perpendicular.

Q.29 Which of the following statements is/are correct for a p-n junction diode?

(a) During forward bias, the width of depletion region decreases and the barrier height is reduced.

(b) During reverse bias, the width of depletion region increases and the barrier height increases.

Ans

✗ 1. Neither (a) nor (b)

✗ 2. Only (b)

✔ 3. Both (a) and (b)

✗ 4. Only (a)

Q.30 Consider two wires, AB and CD, of lengths 2L and L and radius r and 2r, respectively. AB and CD are made of material of resistivity ρ and 2ρ, respectively. The wires are connected in parallel to a battery of EMF E of negligible internal resistance. The ratio of currents through AB and CD, (I_{AB}/I_{CD}) is:

Ans

✔ 1. $\dfrac{1}{4}$

✗ 2. $\dfrac{1}{2}$

✗ 3. 2

✗ 4. 4

Q.31 Let N and N_0 be the number of radioactive nuclei in a sample at time t and at time t = 0, respectively. Then the ratio $\left(\dfrac{N}{N_0}\right)$ is equal to _____ where λ is the disintegration constant or decay constant.

Ans

✗ 1. $e^{-(2\lambda)t}$

✗ 2. 🖼

✗ 3. $e^{-\left(\frac{\lambda}{2}\right)t}$

✔ 4. $e^{-(\lambda)t}$

Q.32 Two batteries, E_1 (emf: 3 V, internal resistance: 0.5 Ω) and E_2 (emf: 6 V, internal resistance: 1.0 Ω), are connected in series by connecting the positive terminal of E_2 to the negative terminal of E_1. A third battery E_3 (emf: 6 V, internal resistance: 1.0 Ω) is connected in parallel with this combination by connecting its positive terminal to the positive terminal of E_1 and its negative terminal to the negative terminal E_2. The equivalent emf of this combination is:

Ans
✔ 1. 7.2 V

✘ 2. 6.0 V

✘ 3. 3.6 V

✘ 4. 4.8 V

Question ID : **630680100013**
Status : **Answered**
Chosen Option : **4**

Q.33 In a single slit diffraction experiment, a light of wavelength 500 nm is used and the second minimum is observed at an angle of 45°. The width of the slit is:

Ans
✘ 1. $2.414\ \mu m$

✘ 2. $0.623\ \mu m$

✘ 3. $1.142\ \mu m$

✔ 4. $1.414\ \mu m$

Question ID : **630680100078**
Status : **Answered**
Chosen Option : **1**

Q.34 A nucleus has an atomic number 64. Considering the nucleus as a liquid –drop, its radius will be close to (R_0 = 1.2 fm):

Ans
✘ 1. 19.2 fm

✘ 2. 9.6 fm

✔ 3. 4.8 fm

✘ 4. 2.4 fm

Question ID : **630680100003**
Status : **Answered**
Chosen Option : **4**

Q.35 Evaluate $\begin{vmatrix} 3 & 6 & 9 \\ 4 & 8 & 12 \\ 5 & 7 & 4 \end{vmatrix}$.

Ans
✔ 1. 0

✘ 2. 69

✘ 3. 54

✘ 4. 78

Question ID : **63068099939**
Status : **Answered**
Chosen Option : **1**

Q.36 Suppose that an alpha particle of 3.20 MeV approaches head-on a lead nucleus (Z=82). Assuming that the lead nucleus remains at rest and the alpha particle momentarily comes to rest and reverses its direction at a distance much more than the radius of the lead nucleus, the distance of its closest approach is:

Ans

✗ 1. 59.2 fm

✗ 2. 36.9 fm

✔ 3. 73.8 fm

✗ 4. 24.6 fm

Q.37

Ans

✗ 1. 6π N m

✗ 2. 8π N m

✗ 3. 2π N m

✔ 4. 4π N m

Q.38 The magnetic field in a plane electromagnetic wave is given by $B_y = 0.2\ \mu T \sin(8\pi \times 10^2 z + 6\pi \times 10^{11} t)$. Then the electric field of the wave is:

Ans

✗ 1. $E_x = 6\ V/m\ \sin(8\pi \times 10^2 z + 6\pi \times 10^{11} t)$

✗ 2. $E_y = 6\ V/m\ \sin(8\pi \times 10^2 z + 6\pi \times 10^{11} t)$

✗ 3. $E_y = 60\ V/m\ \sin(8\pi \times 10^2 z + 6\pi \times 10^{11} t)$

✔ 4. $E_x = 60\ V/m\ \sin(8\pi \times 10^2 z + 6\pi \times 10^{11} t)$

Q.39 Find the first derivative of $e^{x\ln a} + e^{a\ln x} + e^{a\ln a}$.

Ans

✗ 1. $a^x \ln a + ax^{x-1} + a^a$

✗ 2. $a^x + ax^{x-1} + a^a$

✔ 3. $a^x \ln a + ax^{a-1}$

✗ 4. $a^x + ax^{x-1}$

Q.40 The probability of drawing any one spade card is:

Ans
✗ 1. $\dfrac{1}{52}$

✗ 2. $\dfrac{1}{13}$

✗ 3. $\dfrac{4}{13}$

✔ 4. $\dfrac{1}{4}$

Q.41 Consider the set $G = \{a + b\sqrt{2} : a, b \in Q$, the set of all rational numbers$\}$ with respect to binary operation usual addition. Which condition fails for G?

Ans
✗ 1. Associativity property

✗ 2. Identity element

✗ 3. Inverse property

✔ 4. Non-commutativity property

Q.42 $\dfrac{d}{dx} \int_2^x lnt \ dt = ?$

Ans
✗ 1. $\ln 2$

✔ 2. $\ln x$

✗ 3. $\dfrac{1}{x}$

✗ 4. $\dfrac{1}{2}$

Q.43 Find mid point of (4, 3, 6) and (6, 5, 12).

Ans ✗ 1. (4,4,9)

✔ 2. (5,4,9)

✗ 3. (5,4,3)

✗ 4. (5,3,9)

Q.44 Find the minor and cofactor, respectively, for the element 2 in the matrix $\Delta = \begin{pmatrix} 6 & 5 \\ 2 & 4 \end{pmatrix}$.

Ans ✗ 1. $M_{21} = -5, A_{21} = -5$

✗ 2. $M_{21} = -5, A_{21} = 5$

✗ 3. $M_{21} = 5, A_{21} = 5$

✔ 4. $M_{21} = 5, A_{21} = -5$

Q.45 Evaluate $\int x(x^2 - 7)^{15} dx$.

Ans ✗ 1. $(x^3 + 7)^{15} + C$

✗ 2. $(x^3 - 7)^{15} + C$

✔ 3. $\frac{1}{32}(x^2 - 7)^{16} + C$

✗ 4. $(x^2 - 7)^{16} + C$

Q.46 Find all values of x in the interval $[0,2\pi]$ such that $sinx = sin2x$?

Ans ✗ 1. 3

✔ 2. 5

✗ 3. 2

✗ 4. 4

Q.47 Suppose a uniform electric field is given as $E = 4 \times 10^4 \hat{j}$ N/C ($\hat{j}$ *is unit vector along the y axis*), then the flux of this field through a square of 20 cm on a side whose plane is parallel to the xz plane is:

Ans
✔ 1. $1600 \ \text{N m}^2/\text{C}$

✘ 2. $800 \ \text{N m}^2/\text{C}$

✘ 3. $80 \ \text{N m}^2/\text{C}$

✘ 4. $160 \ \text{N m}^2/\text{C}$

Question ID : **630680100039**
Status : **Answered**
Chosen Option : **1**

Q.48 The number of turns in the primary and the secondary coils of a transformer are 800 and 24000, respectively. If the current in the secondary is 6.0 A, the current in the primary is:

Ans
✘ 1. 90 A

✔ 2. 180 A

✘ 3. 120 A

✘ 4. 150 A

Question ID : **630680100047**
Status : **Answered**
Chosen Option : **2**

Q.49 Consider the following relations on the set $\{1, 2, 3, 4\}$:

$R_1 = \{(1,1),(1,2),(1,4),(2,1),(2,2),(3,3),(4,1),(4,4)\}$

$R_2 = \{(2,1),(3,1),(3,2),(4,1),(4,2),(4,3)\}$

$R_3 = \{(1,1),(1,2),(1,3),(1,4),(2,2),(2,3),(2,4),(3,3),(3,4),(4,4)\}$

$R_4 = \{(1,1),(1,2),(2,1),(2,2),(3,4),(4,1),(4,4)\}$

Which of these relations are reflexive and transitive but NOT symmetric?

Ans
✔ 1. R_3

✘ 2. R_1, R_3

✘ 3. R_2, R_4

✘ 4. R_2

Question ID : **63068099883**
Status : **Answered**
Chosen Option : **4**

Q.50 Which of the following is the correct value of tan 10°.tan 20°.tan 60°.tan 70°.tan 80°?

Ans

✗ 1. $1/\sqrt{3}$

✔ 2. $\sqrt{3}$

✗ 3. -1

✗ 4. 1

Q.51 If $f(x) = \frac{1-x}{2+x}$, then find $f'(x)$.

Ans

✗ 1. $\dfrac{1}{(2+x)^2}$

✔ 2. $\dfrac{-3}{(2+x)^2}$

✗ 3. $\dfrac{2}{(3+x)^2}$

✗ 4. $\dfrac{1}{(x-2)^2}$

Q.52 A 2.0 cm segment of a wire, centred at the origin (0,0,0) lies along X-axis. It carries a current of 4.0 A in positive X-direction. The magnetic field due to this segment at a point (0, 4.0 m, 0) is [$(\frac{\mu_0}{4\pi}) = 10^{-7}$ Tm/A, and i, j and k are unit vectors along X-axis, Y-axis and Z-axis, respectively]:

Ans

✗ 1. $-(2.5 \times 10^{-10}$ T) k

✔ 2. $(5.0 \times 10^{-10}$ T) k

✗ 3. $-(5.0 \times 10^{-10}$ T) k

✗ 4. $(2.5 \times 10^{-10}$ T) k

Q.53 If $x^4 + y^4 = 16$, then find the second derivative of y.

Ans

✔ 1. $y'' = \dfrac{-48\,x^2}{y^7}$

✘ 2. $y'' = \dfrac{-24\,x^2}{y^7}$

✘ 3. $y'' = \dfrac{-48\,x^3}{y^5}$

✘ 4. $y'' = \dfrac{32x^2}{y^5}$

Question ID : **63068099894**
Status : **Answered**
Chosen Option : **1**

Q.54 Find a vector perpendicular to the plane that passes through the points $P(1,4,6), Q(-2,5,-1)$ and R $(1,-1,1)$.

Ans

✘ 1. $(-40,-18,15)$

✔ 2. $(-40,-15,15)$

✘ 3. $(40,-15,15)$

✘ 4. $(7,4,-2)$

Question ID : **63068099900**
Status : **Answered**
Chosen Option : **2**

Q.55 Find the magnitude of the shortest distance between the lines $\frac{x-0}{2} = \frac{y-0}{-3} = \frac{z-0}{1}$ and $\frac{x-2}{3} = \frac{y-1}{-5} = \frac{z+2}{2}$.

Ans

✔ 1. $\dfrac{1}{\sqrt{3}}$

✘ 2. $\dfrac{1}{\sqrt{5}}$

✘ 3. $\dfrac{1}{\sqrt{7}}$

✘ 4. $\dfrac{2}{\sqrt{3}}$

Question ID : **63068099927**
Status : **Answered**
Chosen Option : **3**

Q.56 An object that is 2.0 cm in height is placed at a distance of 24.0 cm in front of a concave mirror of focal length 16.0 cm. Following New Cartesian Sign Convention, the image is formed at v is _____ and its height h_i is _____.

Ans
- ✗ 1. 48 cm, 4.0 cm
- ✔ 2. −48 cm, −4.0 cm
- ✗ 3. 9.6 cm, 0.8 cm
- ✗ 4. −9.6 cm, −0.8 cm

Question ID : **63068099997**
Status : **Answered**
Chosen Option : **1**

Q.57 Rutherford scattering experiment is based on:

Ans
- ✔ 1. alpha particle scattering from gold foil
- ✗ 2. beta particle scattering from gold foil
- ✗ 3. gamma rays from aluminium foil
- ✗ 4. beta particle scattering from Zn foil

Question ID : **630680100084**
Status : **Answered**
Chosen Option : **1**

Q.58 What is the area of the triangle with vertices $(3,−2)$, $(4,0)$, $(0,−4)$?

Ans
- ✗ 1. 24
- ✔ 2. 2
- ✗ 3. 4
- ✗ 4. 16

Question ID : **63068099940**
Status : **Answered**
Chosen Option : **2**

Q.59 $\int dx/x = \log |(x)|$ is not possible when:

Ans
- ✗ 1. x=−1
- ✗ 2. x=1
- ✗ 3. x=-2
- ✔ 4. x=0

Question ID : **63068099947**
Status : **Answered**
Chosen Option : **4**

Q.60 When Si is doped with _____ an n-type semiconductor is formed.

Ans
✗ 1. aluminium

✗ 2. boron

✔ 3. phosphorous

✗ 4. indium