

# National Testing Agency

<b>Question Paper Name :</b>	Physics Eng 12th June 2023 Shift 3
<b>Subject Name :</b>	Physics Eng
<b>Creation Date :</b>	2023-06-12 20:46:05
<b>Duration :</b>	120
<b>Total Marks :</b>	400
<b>Display Marks:</b>	Yes

## Physics

<b>Group Number :</b>	1
<b>Group Id :</b>	920906149
<b>Group Maximum Duration :</b>	0
<b>Group Minimum Duration :</b>	120
<b>Show Attended Group? :</b>	No
<b>Edit Attended Group? :</b>	No
<b>Break time :</b>	0
<b>Group Marks :</b>	400
<b>Is this Group for Examiner? :</b>	No
<b>Examiner permission :</b>	Cant View
<b>Show Progress Bar? :</b>	No

## Part A

<b>Section Id :</b>	920906297
<b>Section Number :</b>	1
<b>Section type :</b>	Online
<b>Mandatory or Optional :</b>	Mandatory
<b>Number of Questions :</b>	21
<b>Number of Questions to be attempted :</b>	21
<b>Section Marks :</b>	100
<b>Enable Mark as Answered Mark for Review and Clear Response :</b>	Yes
<b>Maximum Instruction Time :</b>	0
<b>Sub-Section Number :</b>	1
<b>Sub-Section Id :</b>	920906481
<b>Question Shuffling Allowed :</b>	No
<b>Is Section Default? :</b>	null

Question Id : 92090614982 Question Type : COMPREHENSION Sub Question Shuffling Allowed : Yes Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (1 to 5)

Question Label : Comprehension

## **It depends on who is giving the rating: Centre on India's rank in press freedom index**

KRISHNADAS RAJAGOPAL, NEW DELHI

Solicitor-General Tushar Mehta, appearing for the government in the Supreme Court on Tuesday, made light of India's fall to 161<sup>st</sup> position in press freedom ranking, saying "that depends on who is giving the rating. I can have my own forum and give India the first rating".

The remake was in response to the Supreme Court's observation that India has fallen to the 161<sup>st</sup> position out of 180 countries in the World Press Freedom Index published by the non-profit organization, reporters Without Borders. In 2022, India was ranked at 150.

India is ranked behind countries such as Afghanistan, Pakistan and Somalia.

"India is 161 in ranking in journalistic freedom," Justice K.M. Joseph, addressed the Union and Gujarat government, represented by Mr. Mehta during a hearing in the Billkis Bano case.

HEARING ON JULY 10

Change between Justice Joseph and Mr. Meht came while the Supreme Court ordered the publication of a notice giving the details of the case and the next date of court hearing, July 10, in two vernacular papers in Gujarat to alert those unserved among the 11 convicts who were released prematurely from their life imprisonment. They had been found guilty of the gang rape of Ms. Bano and the murder of her family members. Ms. Banop and other writ petitioners have separately challenged their remission.

The hearing, at one point, saw the Supreme Court wonder whether some of the released convicts were making a "mockery" of or even "playing" with the court by either going incognito to hamper the serving of notice of the case on them or seeking time to file counter affidavits. Previous hearings have been a no go with lawyers for the men seeking adjournment on procedural grounds.

The court decided to publish the notice in the newspapers so that the convicts would not take the plea of ignorance and the case could go ahead and be heard on merits.

Sub questions

Question Number : 1 Question Id : 92090614983 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Synonym of the term 'incognito' is:

- |               |               |
|---------------|---------------|
| (1) Inclusive | (2) Inaudible |
| (3) Undutiful | (4) Concealed |

**Options :**

- 92090659201. 1
- 92090659202. 2
- 92090659203. 3
- 92090659204. 4

**Question Number : 2 Question Id : 92090614984 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

'Made light of' means:

- (1) Removed darkness
- (2) Put something on fire
- (3) To act as if something is serious especially when it is not serious
- (4) Play down

**Options :**

- 92090659205. 1
- 92090659206. 2
- 92090659207. 3
- 92090659208. 4

**Question Number : 3 Question Id : 92090614985 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The antonym of 'remission' is:

- (A) Exoneration
- (B) Censure
- (C) Reprieve
- (D) Increase

Choose the correct answer from the options given below :

- (1) (A) and (B)
- (2) (B) and (C)
- (3) (B) and (D)
- (4) (D) only

**Options :**

- 92090659209. 1
- 92090659210. 2
- 92090659211. 3
- 92090659212. 4

**Question Number : 4 Question Id : 92090614986 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

'Going incognito' means:

- (A) Using false name
- (B) Wearing a disguise
- (C) To be recognised
- (D) Not to be identified.

Choose the correct answer from the options given below :

- (1) (A) and (D)
- (2) (A), (B) and (C)
- (3) (A), (B), and (D)
- (4) (A), (B), (C) and (D)

**Options :**

- 92090659213. 1
- 92090659214. 2
- 92090659215. 3
- 92090659216. 4

**Question Number : 5 Question Id : 92090614987 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Why Justice K.M. Josheph addressed Gujurat Government during the hearing?

- (1) Gujurat is the reason behind our sharp fall in press freedom ranking
- (2) India is ranked 161, behind nations such as Pakistan, Afganistan etc.
- (3) Bilk is Bano case was iniatiated and registered in Gujurat.
- (4) The murder convicts were not arrested by the then Gujurat government.

**Options :**

92090659217. 1

92090659218. 2

92090659219. 3

92090659220. 4

**Question Id : 92090614982 Question Type : COMPREHENSION Sub Question Shuffling Allowed : Yes Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Question Numbers : (1 to 5)**

Question Label : Comprehension

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The court decided to publish the notice in the newspapers so that the convicts would not take the plea of ignorance and the case could go ahead and be heard on merits.

### Sub questions

Question Number : 1 Question Id : 92090614983 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Synonym of the term 'incognito' is:

- |               |               |
|---------------|---------------|
| (1) Inclusive | (2) Inaudible |
| (3) Undutiful | (4) Concealed |

**Options :**

- 92090659201. 1
- 92090659202. 2
- 92090659203. 3
- 92090659204. 4

**Question Number : 2 Question Id : 92090614984 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

‘Made light of’ means:

- (1) Removed darkness
- (2) Put something on fire
- (3) To act as if something is serious especially when it is not serious
- (4) Play down

**Options :**

- 92090659205. 1
- 92090659206. 2
- 92090659207. 3
- 92090659208. 4

**Question Number : 3 Question Id : 92090614985 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The antonym of ‘remission’ is:

- (A) Exoneration
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- (C) Reprieve
- (D) Increase

Choose the correct answer from the options given below :

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- (2) (B) and (C)
- (3) (B) and (D)
- (4) (D) only

**Options :**

- 92090659209. 1

92090659210. 2

92090659211. 3

92090659212. 4

**Question Number : 4 Question Id : 92090614986 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

'Going incognito' means:

- (A) Using false name
- (B) Wearing a disguise
- (C) To be recognised
- (D) Not to be identified.

Choose the correct answer from the options given below :

- (1) (A) and (D)
- (2) (A), (B) and (C)
- (3) (A), (B), and (D)
- (4) (A), (B), (C) and (D)

**Options :**

92090659213. 1

92090659214. 2

92090659215. 3

92090659216. 4

**Question Number : 5 Question Id : 92090614987 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Why Justice K.M. Josheph addressed Gujurat Government during the hearing?

- (1) Gujurat is the reason behind our sharp fall in press freedom ranking
- (2) India is ranked 161, behind nations such as Pakistan, Afganistan etc.
- (3) Bilk is Bano case was initiated and registered in Gujurat.
- (4) The murder convicts were not arrested by the then Gujurat government.

**Options :**

92090659217. 1

92090659218. 2

92090659219. 3



92090659220. 4

**Sub-Section Number :** 2  
**Sub-Section Id :** 920906482  
**Question Shuffling Allowed :** Yes  
**Is Section Default? :** null

**Question Number : 6 Question Id : 92090614988 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The synonym of the word 'VINDICTIVE' is \_\_\_\_\_.

- |                   |               |
|-------------------|---------------|
| (1) Revengeful    | (2) Bigoted   |
| (3) Demonstrative | (4) Strategic |

**Options :**

92090659221. 1  
92090659222. 2  
92090659223. 3  
92090659224. 4

**Question Number : 6 Question Id : 92090614988 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The synonym of the word 'VINDICTIVE' is \_\_\_\_\_.

- |                   |               |
|-------------------|---------------|
| (1) Revengeful    | (2) Bigoted   |
| (3) Demonstrative | (4) Strategic |

**Options :**

92090659221. 1  
92090659222. 2  
92090659223. 3  
92090659224. 4

**Question Number : 7 Question Id : 92090614989 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Fill in the blanks with appropriate prepositions from the options given below:

The e-cycle project \_\_\_\_\_ the city is slowly finding takers most of them college students who would earlier depend \_\_\_\_\_ cabs and bike taxis \_\_\_\_\_ commuting.

(1) in, upon, to

(2) in, on, for

(3) in, off, for

(4) on, with, on

**Options :**

92090659225. 1

92090659226. 2

92090659227. 3

92090659228. 4

**Question Number : 7 Question Id : 92090614989 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Fill in the blanks with appropriate prepositions from the options given below:

The e-cycle project \_\_\_\_\_ the city is slowly finding takers most of them college students who would earlier depend \_\_\_\_\_ cabs and bike taxis \_\_\_\_\_ commuting.

(1) in, upon, to

(2) in, on, for

(3) in, off, for

(4) on, with, on

**Options :**

92090659225. 1

92090659226. 2

92090659227. 3

92090659228. 4

**Question Number : 8 Question Id : 92090614990 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Choose the meaning of the term "Bon voyage"

- (A) Used to express good wishes to someone about to set off on a journey.
- (B) Good morning.
- (C) Long Journey.
- (D) Good night.

**Options :**

- 92090659229. 1
- 92090659230. 2
- 92090659231. 3
- 92090659232. 4

**Question Number : 8 Question Id : 92090614990 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Choose the meaning of the term "Bon voyage"

- (A) Used to express good wishes to someone about to set off on a journey.
- (B) Good morning.
- (C) Long Journey.
- (D) Good night.

**Options :**

- 92090659229. 1
- 92090659230. 2
- 92090659231. 3
- 92090659232. 4

**Question Number : 9 Question Id : 92090614991 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The correctly spelt word from the following option:-

- (1) BITUMENEZE
- (2) BIBEMINIZE
- (3) BETUMINEZE
- (4) BITUMINIZE

**Options :**

- 92090659233. 1
- 92090659234. 2
- 92090659235. 3
- 92090659236. 4

**Question Number : 9 Question Id : 92090614991 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The correctly spelt word from the following option:-

- |                |                |
|----------------|----------------|
| (1) BITUMENEZE | (2) BIBEMINIZE |
| (3) BETUMINEZE | (4) BITUMINIZE |

**Options :**

- 92090659233. 1
- 92090659234. 2
- 92090659235. 3
- 92090659236. 4

**Question Number : 10 Question Id : 92090614992 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Fear of open spaces is called:

- |                 |                 |
|-----------------|-----------------|
| (1) Agoraphobia | (2) Anachronism |
| (3) Anecdote    | (4) Apiary      |

**Options :**

- 92090659237. 1
- 92090659238. 2
- 92090659239. 3
- 92090659240. 4

**Question Number : 10 Question Id : 92090614992 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Fear of open spaces is called:

- |                 |                 |
|-----------------|-----------------|
| (1) Agoraphobia | (2) Anachronism |
| (3) Anecdote    | (4) Apiary      |

**Options :**

- 92090659237. 1
- 92090659238. 2
- 92090659239. 3
- 92090659240. 4

**Question Number : 11 Question Id : 92090614993 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

A boat goes 12 km in one hour along the stream and 6 km in one hour against the stream. Th speed of the stream in km/h is:

- (1) 2 (2) 3  
(3) 4 (4) 5

**Options :**

92090659241. 1  
92090659242. 2  
92090659243. 3  
92090659244. 4

**Question Number : 11 Question Id : 92090614993 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

A boat goes 12 km in one hour along the stream and 6 km in one hour against the stream. Th speed of the stream in km/h is:

- (1) 2 (2) 3  
(3) 4 (4) 5

**Options :**

92090659241. 1  
92090659242. 2  
92090659243. 3  
92090659244. 4

**Question Number : 12 Question Id : 92090614994 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

For  $x = 3$ , find the value of  $x^5 + x^4 - x^3 - x^2 + x - 1$ .

- (1) 280 (2) 270  
(3) 290 (4) 300

**Options :**

92090659245. 1  
92090659246. 2

92090659247. 3

92090659248. 4

**Question Number : 12 Question Id : 92090614994 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

For  $x = 3$ , find the value of  $x^5 + x^4 - x^3 - x^2 + x - 1$ .

(1) 280

(2) 270

(3) 290

(4) 300

**Options :**

92090659245. 1

92090659246. 2

92090659247. 3

92090659248. 4

**Question Number : 13 Question Id : 92090614995 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The sides of three solid metallic cubes are 30cm, 40cm and 50cm respectively. Find the side of the new cube formed by melting the three cubes (in cm)

(1) 60

(2) 120

(3) 90

(4) 80

**Options :**

92090659249. 1

92090659250. 2

92090659251. 3

92090659252. 4

**Question Number : 13 Question Id : 92090614995 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The sides of three solid metallic cubes are 30cm, 40cm and 50cm respectively. Find the side of the new cube formed by melting the three cubes (in cm)

(1) 60

(2) 120

(3) 90

(4) 80

**Options :**

- 92090659249. 1
- 92090659250. 2
- 92090659251. 3
- 92090659252. 4

**Question Number : 14 Question Id : 92090614996 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Ankit owes ₹ 42,580 on his credit cards, but he could pay only ₹ 12,580. If the annual rate of compound interest is 10%, then how much will he owe after 4 years?

- |                |                |
|----------------|----------------|
| (1) Rs. 42,580 | (2) Rs. 43,000 |
| (3) Rs. 43,923 | (4) Rs. 44,228 |

**Options :**

- 92090659253. 1
- 92090659254. 2
- 92090659255. 3
- 92090659256. 4

**Question Number : 14 Question Id : 92090614996 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Ankit owes ₹ 42,580 on his credit cards, but he could pay only ₹ 12,580. If the annual rate of compound interest is 10%, then how much will he owe after 4 years?

- |                |                |
|----------------|----------------|
| (1) Rs. 42,580 | (2) Rs. 43,000 |
| (3) Rs. 43,923 | (4) Rs. 44,228 |

**Options :**

- 92090659253. 1
- 92090659254. 2
- 92090659255. 3
- 92090659256. 4

**Question Number : 15 Question Id : 92090614997 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The percentage of loss when an article is sold at Rs. 50 is the same as that of the profit when it is sold at Rs. 70. Percentage of profit or loss on the article is\_\_\_\_\_.

- (1) 10% (2) 12%  
(3)  $16\frac{2}{3}\%$  (4)  $8\frac{1}{3}\%$

**Options :**

92090659257. 1  
92090659258. 2  
92090659259. 3  
92090659260. 4

**Question Number : 15 Question Id : 92090614997 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The percentage of loss when an article is sold at Rs. 50 is the same as that of the profit when it is sold at Rs. 70. Percentage of profit or loss on the article is\_\_\_\_\_.

- (1) 10% (2) 12%  
(3)  $16\frac{2}{3}\%$  (4)  $8\frac{1}{3}\%$

**Options :**

92090659257. 1  
92090659258. 2  
92090659259. 3  
92090659260. 4

**Question Number : 16 Question Id : 92090614998 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Which number comes next in the following series?

0, 5, 22, 57, 116, \_\_\_\_\_.

- (1) 216 (2) 205  
(3) 207 (4) 192

**Options :**

92090659261. 1  
92090659262. 2  
92090659263. 3  
92090659264. 4



**Question Number : 16 Question Id : 92090614998 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Which number comes next in the following series?

0, 5, 22, 57, 116, \_\_\_\_\_.

- (1) 216 (2) 205  
(3) 207 (4) 192

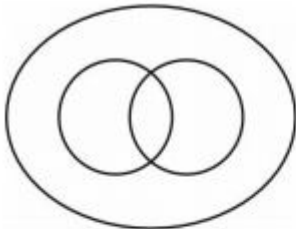
**Options :**

92090659261. 1  
92090659262. 2  
92090659263. 3  
92090659264. 4

**Question Number : 17 Question Id : 92090614999 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Which of the following group best represented by the figure below:



- (A) Men, Citizions, Educated  
(B) Professionals, Doctors, Lawyers  
(C) Diseases, Leprosy, Scurvy  
(D) Earth, mountain, Forests.  
(E) Atmosphere, Water, Hydrogen.

Choose the correct answer from the options given below :

- (1) (A) and(B) only  
(2) (B) and (D) only  
(3) (A) and (D) only  
(4) (C) and (E) only

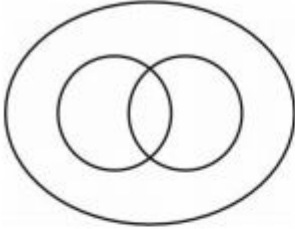
**Options :**

92090659265. 1  
92090659266. 2  
92090659267. 3  
92090659268. 4

**Question Number : 17 Question Id : 92090614999 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Which of the following group best represented by the figure below:



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- (B) Professionals, Doctors, Lawyers
- (C) Diseases, Leprosy, Scurvy
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Choose the correct answer from the options given below :

- (1) (A) and(B) only
- (2) (B) and (D) only
- (3) (A) and (D) only
- (4) (C) and (E) only

**Options :**

92090659265. 1  
92090659266. 2  
92090659267. 3  
92090659268. 4

**Question Number : 18 Question Id : 92090615000 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Identify the correct water – image of the fig. (X)

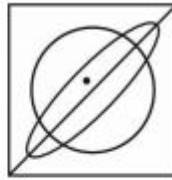
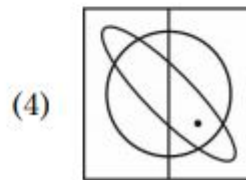
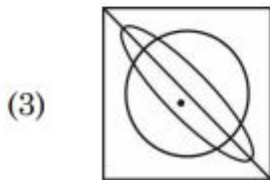
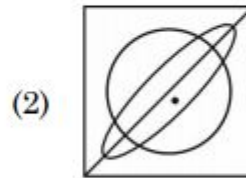
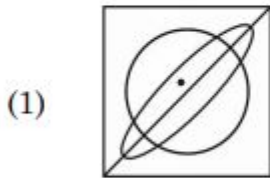


Fig. (X)



**Options :**

92090659269. 1

92090659270. 2

92090659271. 3

92090659272. 4

**Question Number : 18 Question Id : 92090615000 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Identify the correct water – image of the fig. (X)

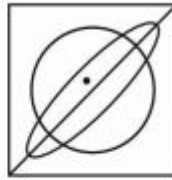
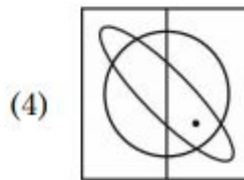
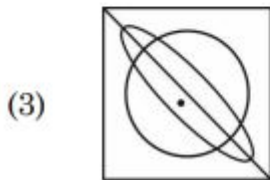
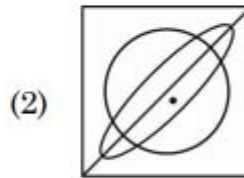
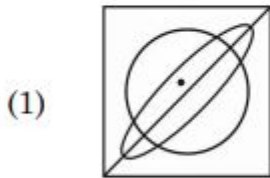


Fig. (X)



**Options :**

- 92090659269. 1
- 92090659270. 2
- 92090659271. 3
- 92090659272. 4

**Question Number : 19 Question Id : 92090615001 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

If in a certain language, GRASP is coded as BMVNK, which word could be coded as CRANE?

- (1) FUDQH
- (2) GVERI
- (3) HWFSJ
- (4) BQZMD

**Options :**

- 92090659273. 1
- 92090659274. 2
- 92090659275. 3
- 92090659276. 4

**Question Number : 19 Question Id : 92090615001 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

If in a certain language, GRASP is codes as BMVNK, which word could be coded as CRANE?

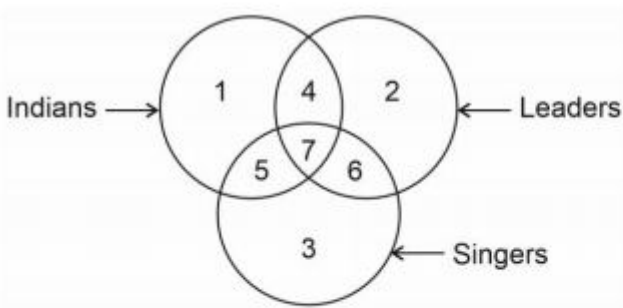
- (1) FUDQH (2) GVERI  
(3) HWFSJ (4) BQZMD

**Options :**

92090659273. 1  
92090659274. 2  
92090659275. 3  
92090659276. 4

**Question Number : 20 Question Id : 92090615002 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**



Which region represents leaders who are neither singers nor Indians?

- (1) 3 (2) 6  
(3) 2 (4) 4

**Options :**

92090659277. 1  
92090659278. 2  
92090659279. 3  
92090659280. 4

**Question Number : 20 Question Id : 92090615002 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**



**Options :**

- 92090659281. 1
- 92090659282. 2
- 92090659283. 3
- 92090659284. 4

**Question Number : 22 Question Id : 92090615004 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Pandit Shiv Kumar Sharma who passed away in May 2022 was a maestro of:

- (1) Flute
- (2) Santoor
- (3) Tabla
- (4) EsraJ

**Options :**

- 92090659285. 1
- 92090659286. 2
- 92090659287. 3
- 92090659288. 4

**Question Number : 22 Question Id : 92090615004 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Pandit Shiv Kumar Sharma who passed away in May 2022 was a maestro of:

- (1) Flute
- (2) Santoor
- (3) Tabla
- (4) EsraJ

**Options :**

- 92090659285. 1
- 92090659286. 2
- 92090659287. 3
- 92090659288. 4

**Question Number : 23 Question Id : 92090615005 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Largest Gas pipe line in India is operated by which company?

- (1) Reliance Petroleum
- (2) GAIL
- (3) ONGC
- (4) Bharat Petroleum

**Options :**

- 92090659289. 1
- 92090659290. 2
- 92090659291. 3
- 92090659292. 4

**Question Number : 23 Question Id : 92090615005 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Largest Gas pipe line in India is operated by which company?

- (1) Reliance Petroleum
- (2) GAIL
- (3) ONGC
- (4) Bharat Petroleum

**Options :**

- 92090659289. 1
- 92090659290. 2
- 92090659291. 3
- 92090659292. 4

**Question Number : 24 Question Id : 92090615006 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Which of the following can be recycled 100%?

- (1) Food waste
- (2) Glass bottles
- (3) Alluminium cans
- (4) Card board

**Options :**

- 92090659293. 1
- 92090659294. 2
- 92090659295. 3
- 92090659296. 4

**Question Number : 24 Question Id : 92090615006 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**



Which of the following can be recycled 100%?

- |                     |                   |
|---------------------|-------------------|
| (1) Food waste      | (2) Glass bottles |
| (3) Alluminium cans | (4) Card board    |

**Options :**

- 92090659293. 1
- 92090659294. 2
- 92090659295. 3
- 92090659296. 4

**Question Number : 25 Question Id : 92090615007 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Given below are two statements :

Statement I : "The Restoration of life of Lok Sabha and State Assemblies to 5year" is passed in the 52<sup>nd</sup> Amendment of constitution of India

Statement II : 99<sup>th</sup> Amendment of constitution of India provides for formation of National Judicial Appointments Commission".

In the light of the above statements, choose the correct answer from the options given below :

- (1) Both Statement I and Statement II are correct
- (2) Both Statement I and Statement II are incorrect
- (3) Statement I is correct but Statement II is incorrect
- (4) Statement I is incorrect but Statement II is correct

**Options :**

- 92090659297. 1
- 92090659298. 2
- 92090659299. 3
- 92090659300. 4

**Question Number : 25 Question Id : 92090615007 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Given below are two statements :

Statement I : "The Restoration of life of Lok Sabha and State Assemblies to 5year" is passed in the 52<sup>nd</sup> Amendment of constitution of India

Statement II : 99<sup>th</sup> Amendment of constitution of India provides for formation of National Judicial Appointments Commission".

In the light of the above statements, choose the correct answer from the options given below :

- (1) Both Statement I and Statement II are correct
- (2) Both Statement I and Statement II are incorrect
- (3) Statement I is correct but Statement II is incorrect
- (4) Statement I is incorrect but Statement II is correct

**Options :**

92090659297. 1

92090659298. 2

92090659299. 3

92090659300. 4

## Part B: Physics

Section Id :	920906298
Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	75
Number of Questions to be attempted :	75
Section Marks :	300
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	920906483
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 26 Question Id : 92090615008 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Given below are two statements, one is labelled as Assertion (A) and the other is labelled as Reason (R) :

Assertion (A) : A given vector  $\vec{F}$  is irrotational i.e.,  $\vec{\nabla} \times \vec{F} = 0$ .

Reason (R) : The vector  $\vec{F}$  is conservative.

In the light of the above statements, choose the *most appropriate answer* from the options given below.

1. Both (A) and (R) are correct and (R) is the correct explanation of (A)
2. Both (A) and (R) are correct but (R) is not the correct explanation of (A)
3. (A) is correct but (R) is not correct
4. (A) is not correct but (R) is correct

**Options :**

92090659301. 1

92090659302. 2

92090659303. 3

92090659304. 4

**Question Number : 26 Question Id : 92090615008 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

नीचे दो कथन दिए गए हैं : एक अभिकथन (Assertion (A)) के रूप में लिखित है तो दूसरा उसके कारण (Reasons (R)) के रूप में :

अभिकथन (A) : दिया गया सदिश  $\vec{F}$  अघूर्णी है अर्थात्  $\vec{\nabla} \times \vec{F} = 0$ .

कारण (R) : सदिश  $\vec{F}$  संरक्षी है।

उपरोक्त कथन के आलोक में, नीचे दिए गए विकल्पों में से सबसे उपयुक्त उत्तर का चयन कीजिए

- (1) (A) और (R) दोनों सत्य हैं और (R), (A) की सही व्याख्या है
- (2) (A) और (R) दोनों सत्य हैं, लेकिन (R), (A) की सही व्याख्या नहीं है
- (3) (A) सत्य है, लेकिन (R) असत्य है
- (4) (A) असत्य है, लेकिन (R) सत्य है

**Options :**

92090659301. 1

92090659302. 2

92090659303. 3

92090659304. 4

**Question Number : 27 Question Id : 92090615009 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Given below are two statements :

If  $z_1$  and  $z_2$  are complex numbers

Statement-I :  $\arg\left(\frac{z_1}{z_2}\right) = \arg(z_1) - \arg(z_2)$

Statement-II :  $|z_1 + z_2|^2 = |z_1|^2 + |z_2|^2 - 2\operatorname{Re}(z_1\bar{z}_2)$

In the light of the above statements, choose the *correct* answer from the options given below.

1. Both Statement-I and Statement-II are true
2. Both Statement-I and Statement-II are false
3. Statement-I is correct but Statement-II is false
4. Statement-I is incorrect but Statement-II is true

**Options :**

92090659305. 1

92090659306. 2

92090659307. 3

92090659308. 4

**Question Number : 27 Question Id : 92090615009 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

यदि  $z_1$  और  $z_2$  सम्मिश्र संख्याएं हैं

$$\text{कथन I : } \arg\left(\frac{z_1}{z_2}\right) = \arg(z_1) - \arg(z_2)$$

$$\text{कथन II : } |z_1 + z_2|^2 = |z_1|^2 + |z_2|^2 - 2\operatorname{Re}(z_1\bar{z}_2)$$

उपरोक्त कथन के आलोक में, नीचे दिए गए विकल्पों में से सबसे उपयुक्त उत्तर का चयन कीजिए :

- (1) कथन I और II दोनों सत्य हैं
- (2) कथन I और II दोनों गलत हैं
- (3) कथन I सत्य है, लेकिन कथन II असत्य है
- (4) कथन I असत्य है, लेकिन कथन II सत्य है

**Options :**

92090659305. 1  
92090659306. 2  
92090659307. 3  
92090659308. 4

**Question Number : 28 Question Id : 92090615010 Question Type : MCQ Option Shuffling : No Is  
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum  
Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Match List-I with List-II :

	List-I		List-II
(A)	$\sin z$ for $ z  < \infty$	(I)	$(-1)^{n-1} z^{2n-1} / (2n-2)!$
(B)	$\cos z$ for $ z  < \infty$	(II)	$(-1)^{n-1} z^n / n$
(C)	$\tan^{-1} z$ for $ z  < 1$	(III)	$(-1)^{n-1} z^{2n-1} / (2n-1)!$
(D)	$\ln(1+z)$ for $ z  < 1$	(IV)	$(-1)^{n-1} z^{2n-1} / (2n-1)$

Choose the correct answer from the options given below :

1. (A)–(II); (B)–(III); (C)–(IV); (D)–(I)
2. (A)–(I); (B)–(II); (C)–(IV); (D)–(III)
3. (A)–(III); (B)–(I); (C)–(IV); (D)–(II)
4. (A)–(III); (B)–(I); (C)–(II); (D)–(IV)

**Options :**

92090659309. 1

92090659310. 2

92090659311. 3

92090659312. 4

**Question Number : 28 Question Id : 92090615010 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

सूची-I के साथ सूची-II का मिलान कीजिए :

सूची-I	सूची-II
(A) $\sin z$ के लिए $ z  < \infty$	(I) $(-1)^{n-1} z^{2n-1} / (2n-2)!$
(B) $\cos z$ के लिए $ z  < \infty$	(II) $(-1)^{n-1} z^n / n$
(C) $\tan^{-1} z$ के लिए $ z  < 1$	(III) $(-1)^{n-1} z^{2n-1} / (2n-1)!$
(D) $\ln(1+z)$ के लिए $ z  < 1$	(IV) $(-1)^{n-1} z^{2n-1} / (2n-1)$

नीचे दिए गए विकल्पों में से सही उत्तर का चयन कीजिए :

- (1) (A)-(II), (B)-(III), (C)-(IV), (D)-(I)
- (2) (A)-(I), (B)-(II), (C)-(IV), (D)-(III)
- (3) (A)-(III), (B)-(I), (C)-(IV), (D)-(II)
- (4) (A)-(III), (B)-(I), (C)-(II), (D)-(IV)

**Options :**

92090659309. 1  
92090659310. 2  
92090659311. 3  
92090659312. 4

**Question Number : 29 Question Id : 92090615011 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

If  $A = \begin{bmatrix} 2 & 3 & 1 \\ 0 & -1 & 5 \end{bmatrix}$  and  $B = \begin{bmatrix} 1 & 2 & -1 \\ 0 & -1 & 3 \end{bmatrix}$ , what is the value of  $(2A - 3B)$ ?

1.  $\begin{bmatrix} 1 & 1 & 0 \\ 0 & 1 & 5 \end{bmatrix}$
2.  $\begin{bmatrix} 1 & 0 & 5 \\ 0 & 1 & 1 \end{bmatrix}$
3.  $\begin{bmatrix} 0 & 1 & 1 \\ 1 & 0 & 5 \end{bmatrix}$
4.  $\begin{bmatrix} 5 & 0 & 1 \\ 1 & 1 & 0 \end{bmatrix}$

**Options :**

92090659313. 1

92090659314. 2

92090659315. 3

92090659316. 4

**Question Number : 29 Question Id : 92090615011 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

यदि  $A = \begin{bmatrix} 2 & 3 & 1 \\ 0 & -1 & 5 \end{bmatrix}$  और  $B = \begin{bmatrix} 1 & 2 & -1 \\ 0 & -1 & 3 \end{bmatrix}$ ,  $(2A - 3B)$  का मान क्या है?

(1)  $\begin{bmatrix} 1 & 1 & 0 \\ 0 & 1 & 5 \end{bmatrix}$

(2)  $\begin{bmatrix} 1 & 0 & 5 \\ 0 & 1 & 1 \end{bmatrix}$

(3)  $\begin{bmatrix} 0 & 1 & 1 \\ 1 & 0 & 5 \end{bmatrix}$

(4)  $\begin{bmatrix} 5 & 0 & 1 \\ 1 & 1 & 0 \end{bmatrix}$

**Options :**

92090659313. 1

92090659314. 2

92090659315. 3

92090659316. 4

**Question Number : 30 Question Id : 92090615012 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The line integral per unit area along the boundary of small area around a point in vector field  $\vec{A}$  is called

1.  $\text{grad } \vec{A}$

2.  $\text{div } \vec{A}$

3.  $\text{curl } \vec{A}$

4. line integral  $\vec{A}$

**Options :**

92090659317. 1

92090659318. 2

92090659319. 3



92090659320. 4

**Question Number : 30 Question Id : 92090615012 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

किसी सदिश क्षेत्र  $\vec{A}$  में किसी बिन्दु के चारों ओर लघु क्षेत्रफल की परिसीमा के साथ रैखिक-समाकल प्रति एकांक क्षेत्रफल कहलाता है।

(1)  $\text{grad } \vec{A}$

(2)  $\text{div } \vec{A}$

(3)  $\text{curl } \vec{A}$

(4) line integral  $\vec{A}$

**Options :**

92090659317. 1

92090659318. 2

92090659319. 3

92090659320. 4

**Question Number : 31 Question Id : 92090615013 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

If  $A = \begin{bmatrix} 1 & 0 \\ 2 & -1 \end{bmatrix}$ ,  $B = \begin{bmatrix} 3 & 7 \\ 4 & 8 \end{bmatrix}$  and  $C = \begin{bmatrix} -1 & 1 \\ 0 & 0 \end{bmatrix}$ . The value of  $A + (B + C)$  is

1.  $\begin{bmatrix} 3 & 7 \\ 6 & 8 \end{bmatrix}$

2.  $\begin{bmatrix} 6 & 7 \\ 3 & 8 \end{bmatrix}$

3.  $\begin{bmatrix} 8 & 3 \\ 7 & 6 \end{bmatrix}$

4.  $\begin{bmatrix} 3 & 8 \\ 6 & 7 \end{bmatrix}$

**Options :**

92090659321. 1

92090659322. 2

92090659323. 3

92090659324. 4

Question Number : 31 Question Id : 92090615013 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

यदि  $A = \begin{bmatrix} 1 & 0 \\ 2 & -1 \end{bmatrix}$ ,  $B = \begin{bmatrix} 3 & 7 \\ 4 & 8 \end{bmatrix}$  और  $C = \begin{bmatrix} -1 & 1 \\ 0 & 0 \end{bmatrix}$ ,  $A + (B + C)$  का मान है -

(1)  $\begin{bmatrix} 3 & 7 \\ 6 & 8 \end{bmatrix}$

(2)  $\begin{bmatrix} 6 & 7 \\ 3 & 8 \end{bmatrix}$

(3)  $\begin{bmatrix} 8 & 3 \\ 7 & 6 \end{bmatrix}$

(4)  $\begin{bmatrix} 3 & 8 \\ 6 & 7 \end{bmatrix}$

Options :

92090659321. 1

92090659322. 2

92090659323. 3

92090659324. 4

Question Number : 32 Question Id : 92090615014 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

What is the value of  $\text{div } \vec{r}$ , if  $\vec{r}$  is the position vector of a particle?

$$\left( \vec{r} = x\hat{i} + y\hat{j} + z\hat{k} \right)$$

1. 1

2. 2

3. 3

4. zero

Options :

92090659325. 1

92090659326. 2

92090659327. 3

92090659328. 4

Question Number : 32 Question Id : 92090615014 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

यदि किसी कण का स्थिति सदिश  $\vec{r}$  ( $\vec{r} = x\hat{i} + y\hat{j} + z\hat{k}$ ) है, तो  $\text{div } \vec{r}$  का मान क्या है?

- (1) 1 (2) 2  
(3) 3 (4) शून्य

**Options :**

92090659325. 1  
92090659326. 2  
92090659327. 3  
92090659328. 4

**Question Number : 33 Question Id : 92090615015 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

If  $\vec{r}$  is the position vector of any point on a surface  $S$  that encloses the volume  $V$ , then find  $\iiint_S \vec{r} \cdot d\vec{S}$ .

1.  $1 V$   
2.  $2 V$   
3.  $3 V$   
4.  $4 V$

**Options :**

92090659329. 1  
92090659330. 2  
92090659331. 3  
92090659332. 4

**Question Number : 33 Question Id : 92090615015 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

आयतन  $V$  से परिवद्ध किसी सतह  $S$  पे यदि किसी बिन्दु की स्थिति सदिश  $\vec{r}$  है, तब  $\iiint_S \vec{r} \cdot d\vec{s}$  होगा -

- (1)  $1 V$  (2)  $2 V$   
(3)  $3 V$  (4)  $4 V$

**Options :**

92090659329. 1  
92090659330. 2  
92090659331. 3  
92090659332. 4

**Question Number : 34 Question Id : 92090615016 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

An infinite long wire is stretched horizontally 4 m above the surface of the earth. It has a charge of 1.0 micro-coulomb ( $\mu\text{C}$ ) per cm of its length. The value of electric field at a point on earth vertically below the wire is

1. 4.5 N/C
2. 45.0 N/C
3.  $4.5 \times 10^5$  N/C
4.  $2.5 \times 10^3$  N/C

**Options :**

92090659333. 1  
92090659334. 2  
92090659335. 3  
92090659336. 4

**Question Number : 34 Question Id : 92090615016 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

पृथ्वी की सतह से 4 m ऊपर एक अपरिमित लम्बाई का तार क्षैतिजत खींचा गया है इसकी प्रति सेन्टीमीटर लम्बाई पर आवेश 1.0 माइक्रो-कूलाम ( $\mu\text{C}$ ) है। तार के लम्बवत् नीचे पृथ्वी के किसी बिन्दु पर विद्युत क्षेत्र का मान है -

- |                           |                           |
|---------------------------|---------------------------|
| (1) 4.5 N/C               | (2) 45.0 N/C              |
| (3) $4.5 \times 10^5$ N/C | (4) $2.5 \times 10^3$ N/C |

**Options :**

92090659333. 1  
92090659334. 2  
92090659335. 3  
92090659336. 4

**Question Number : 35 Question Id : 92090615017 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Choose the correct sequence of the four statements given below, so that the phrase makes a complete sense:

- A. Then the sets of equations connecting both are known as transformation of co-ordinates.
- B. We can associate a unique set of co-ordinates.
- C. Given a point  $P$  in rectangular co-ordinates.
- D. Called the curvilinear co-ordinates of  $P$ .

Choose the correct answer from the options given below.

- 1. (A), (B), (C), (D)
- 2. (B), (C), (D), (A)
- 3. (C), (B), (D), (A)
- 4. (B), (A), (D), (C)

**Options :**

92090659337. 1

92090659338. 2

92090659339. 3

92090659340. 4

**Question Number : 35 Question Id : 92090615017 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

नीचे दिए गए चार कथनों का सही क्रम चुनिए जिससे कि वाक्यांशों का अभिप्राय स्पष्ट हो-

- (A) दोनों को जोड़ने वाले समीकरणों के समूह को निर्देशांकों का रूपांतरण कहते हैं।
- (B) किसी अद्वितीय निर्देशांकों के समूह को संबद्ध कर सकते हैं।
- (C) आयताकार निर्देशांकों में कोई बिन्दु P दिया है।
- (D) P के वक्ररेखी निर्देशांक कहलाते हैं।

नीचे दिए गए विकल्पों में से सही उत्तर का चयन कीजिए :

- (1) (A), (B), (C), (D)
- (2) (B), (C), (D), (A)
- (3) (C), (B), (D), (A)
- (4) (B), (A), (D), (C)

**Options :**

- 92090659337. 1
- 92090659338. 2
- 92090659339. 3
- 92090659340. 4

**Question Number : 36 Question Id : 92090615018 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The general form of a central force is represented by  $\vec{F} = \frac{C}{r^n} \hat{r}$  ( $C = \text{constant}$ )

known as Inverse Power law.

- A. The force represented by above equation will be attractive if  $C < 0$ .
- B. The force represented by above equation will repulsive if  $C < 0$ .
- C. The force represented by above equation will be repulsive if  $C > 0$ .
- D. The force represented by above equation will be attractive if  $C > 0$ .

Choose the correct answer from the options given below.

- 1. A and B only
- 2. B and C only
- 3. A and C only
- 4. A and D only

**Options :**

92090659341. 1

92090659342. 2

92090659343. 3

92090659344. 4

**Question Number : 36 Question Id : 92090615018 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

केन्द्रीय बल का व्यापक रूप है  $\vec{F} = \frac{C}{r^n} \hat{r}$  जहाँ  $C$  एक नियंताक है। इसे प्रतिलोम सामर्थ्य नियम कहते हैं।

- (A) उपरोक्त समीकरण द्वारा निरूपित बल आकर्षण का होगा यदि  $C < 0$ .
- (B) उपरोक्त समीकरण द्वारा निरूपित बल प्रतिकर्षण का होगा यदि  $C < 0$ .
- (C) उपरोक्त समीकरण द्वारा निरूपित बल प्रतिकर्षण का होगा यदि  $C > 0$ .
- (D) उपरोक्त समीकरण द्वारा निरूपित बल आकर्षण का होगा यदि  $C > 0$ .

नीचे दिए गए विकल्पों में से सही उत्तर का चयन कीजिए :

- (1) केवल (A) और (B)
- (2) केवल (B) और (C)
- (3) केवल (A) और (C)
- (4) केवल (A) और (D)

**Options :**

- 92090659341. 1
- 92090659342. 2
- 92090659343. 3
- 92090659344. 4

**Question Number : 37 Question Id : 92090615019 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

There are three planets in circular orbits around a star at a distance  $a$ ,  $9a$  and  $16a$  respectively. At time  $t = t_0$ , the star and the planets are in a straight line. The period of revolution of the closest planet is  $T$ . How long after  $t_0$ , will they again be in the same line?

- 1.  $216 T$
- 2.  $512 T$
- 3.  $1728 T$
- 4.  $3456 T$

**Options :**

- 92090659345. 1
- 92090659346. 2
- 92090659347. 3



**Question Number : 37 Question Id : 92090615019 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

किसी तारे के चारों ओर वृत्तीय कक्षाओं में तीन ग्रह क्रमशः  $a$ ,  $9a$  और  $16a$  दूरी पर हैं। किसी समय  $t = t_0$  पर तारा और तीनों ग्रह एक सीधी रेखा में हैं। निकटतम ग्रह का परिक्रमण काल  $T$  है।  $t_0$  के कितने समय पश्चात् तारा और तीनों ग्रह पुनः एक सीधी रेखा में होंगे ?

- (1)  $216 T$  (2)  $512 T$   
 (3)  $1728 T$  (4)  $3456 T$

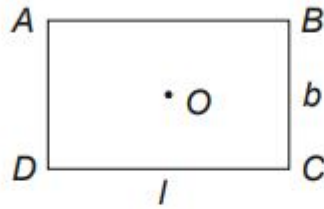
**Options :**

92090659345. 1  
 92090659346. 2  
 92090659347. 3  
 92090659348. 4

**Question Number : 38 Question Id : 92090615020 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

What will be the expression for moment of inertia of a rectangular lamina ( $ABCD$  having length  $l$  and breadth  $b$ ) about an axis passing through one of its corners and perpendicular to its plane?



1.  $I = \frac{M}{12}(l^2 + b^2)$   
 2.  $I = M\left(\frac{l^2}{12} + \frac{b^2}{6}\right)$   
 3.  $I = M\left(\frac{l^2}{6} + \frac{b^2}{12}\right)$   
 4.  $I = \frac{M}{3}(l^2 + b^2)$

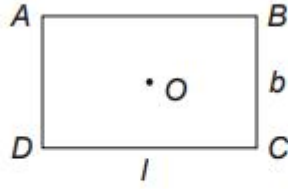
**Options :**

92090659349. 1  
 92090659350. 2  
 92090659351. 3  
 92090659352. 4

**Question Number : 38 Question Id : 92090615020 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

किसी आयताकार पटल (ABCD जिसकी लम्बाई  $l$  और चौड़ाई  $b$  है), इसके एक कोने से, पटल के लम्बवत् गुजरने वाले अक्ष के परितः जड़त्व-आघूर्ण का व्यंजक क्या होगा?



(1)  $I = \frac{M}{12}(l^2 + b^2)$

(2)  $I = M \left( \frac{l^2}{12} + \frac{b^2}{6} \right)$

(3)  $I = M \left( \frac{l^2}{6} + \frac{b^2}{12} \right)$

(4)  $I = \frac{M}{3}(l^2 + b^2)$

**Options :**

92090659349. 1  
 92090659350. 2  
 92090659351. 3  
 92090659352. 4

**Question Number : 39 Question Id : 92090615021 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Match List-I with List-II :

	List-I		List-II
(A)	Green's theorem	(I)	Moment of inertia
(B)	Kepler's laws	(II)	Vectors
(C)	Theorem of parallel and perpendicular axes	(III)	Inertia
(D)	Newton's law	(IV)	Motion of planets

Choose the correct answer from the options given below :

1. (A)–(I); (B)–(III); (C)–(II); (D)–(IV)
2. (A)–(III); (B)–(II); (C)–(IV); (D)–(I)
3. (A)–(II); (B)–(IV); (C)–(I); (D)–(III)
4. (A)–(IV); (B)–(III); (C)–(I); (D)–(II)

**Options :**

92090659353. 1

92090659354. 2

92090659355. 3

92090659356. 4

**Question Number : 39 Question Id : 92090615021 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

सूची-I के साथ सूची-II का मिलान कीजिए :

सूची-I	सूची-II
(A) ग्रीन की प्रमेय	(I) जड़त्व-आघूर्ण
(B) केप्लर के नियम	(II) सदिश
(C) समांतर और अभिलम्बवत् अक्षों की प्रमेय	(III) जड़त्व
(D) न्यूटन का नियम	(IV) ग्रहों की गति

नीचे दिए गए विकल्पों में से सही उत्तर का चयन कीजिए :

- (1) (A)-(I), (B)-(III), (C)-(II), (D)-(IV)
- (2) (A)-(III), (B)-(II), (C)-(IV), (D)-(I)
- (3) (A)-(II), (B)-(IV), (C)-(I), (D)-(III)
- (4) (A)-(IV), (B)-(III), (C)-(I), (D)-(II)

**Options :**

92090659353. 1  
92090659354. 2  
92090659355. 3  
92090659356. 4

**Question Number : 40 Question Id : 92090615022 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Gravitational force between two masses  $m_1$  and  $m_2$  separated by a distance  $r$  is

- A. central force
- B. non-central force
- C. attractive force
- D. repulsive force
- E. directly proportional to the distance between  $m_1$  and  $m_2$

Choose the correct answer from the options given below.

1. A only
2. B only
3. A and C only
4. D and E only

**Options :**

92090659357. 1  
92090659358. 2  
92090659359. 3  
92090659360. 4

**Question Number : 40 Question Id : 92090615022 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

किन्हीं दो द्रव्यमानों  $m_1$  और  $m_2$  जिनके बीच दूरी  $r$  है, के मध्य लगने वाला गुरुत्वाकर्षण बल है

- (A) केन्द्रीय बल  
(B) अकेन्द्रीय बल  
(C) आकर्षण बल  
(D) प्रतिकर्षण बल  
(E)  $m_1$  और  $m_2$  के बीच दूरी के समानुपाती है।

नीचे दिए गए विकल्पों में से सही उत्तर का चयन कीजिए :

- (1) केवल (A)  
(2) केवल (B)  
(3) केवल (A) और (C)  
(4) केवल (D) और (E)

**Options :**

92090659357. 1  
92090659358. 2  
92090659359. 3  
92090659360. 4

**Question Number : 41 Question Id : 92090615023 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

A bullet of mass 10 g moving horizontally with a speed of 500 m/s passes through a block of wood of mass 1 kg, initially at rest on a frictionless surface. The bullet comes out of the block with a speed of 200 m/s. What is the final speed of the block?

1. 0
2. 1 m/s
3. 2 m/s
4. 3 m/s

**Options :**

92090659361. 1  
92090659362. 2  
92090659363. 3  
92090659364. 4

**Question Number : 41 Question Id : 92090615023 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

10 g द्रव्यमान की एक गोली 500 m/s की चाल से क्षैतिज गति करते हुए 1 kg द्रव्यमान के एक लकड़ी के गुटके से गुजरती है जो प्रारम्भ में किसी घर्षणरहित सतह पर विरामावस्था में रखा हुआ है। गोली गुटके से 200 m/s की चाल से बाहर निकलती है। गुटके की अन्तिम चाल क्या है?

- |           |           |
|-----------|-----------|
| (1) 0     | (2) 1 m/s |
| (3) 2 m/s | (4) 3 m/s |

**Options :**

92090659361. 1  
92090659362. 2  
92090659363. 3  
92090659364. 4

**Question Number : 42 Question Id : 92090615024 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

What will be the spring constant of a spring? When it is stretched 10 cm, it has potential energy of 5600 J.

1. 1.12 N/m
2. 11.2 N/m
3.  $1.12 \times 10^6$  N/m
4. zero

**Options :**

92090659365. 1  
92090659366. 2  
92090659367. 3  
92090659368. 4

**Question Number : 42 Question Id : 92090615024 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

किसी स्प्रिंग को 10 cm खींचने पर, उसकी स्थितिज ऊर्जा 5600 J है, तो स्प्रिंग का स्प्रिंग नियंताक क्या होगा?

- |                            |              |
|----------------------------|--------------|
| (1) 1.12 N/m               | (2) 11.2 N/m |
| (3) $1.12 \times 10^6$ N/m | (4) शून्य    |

**Options :**

92090659365. 1  
92090659366. 2  
92090659367. 3  
92090659368. 4

**Question Number : 43 Question Id : 92090615025 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The work done in a gravitational field between two points does not depend upon the path between these points. The field

1. can be conservative or non-conservative
2. is conservative
3. is non-conservative
4. Nature of field can not be determined

**Options :**

92090659369. 1  
92090659370. 2  
92090659371. 3  
92090659372. 4

**Question Number : 43 Question Id : 92090615025 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

गुरुत्वीय क्षेत्र में किन्हीं दो बिन्दुओं के बीच किया गया कार्य इन बिन्दुओं के मध्य पथ पर निर्भर नहीं करता है। क्षेत्र

- |                                       |   |
|---------------------------------------|---|
| (1) संरक्षी अथवा असंरक्षी हो सकता है। | (2) संरक्षी है                                    |
| (3) असंरक्षी है                       | (4) क्षेत्र की प्रकृति निर्धारित नहीं की जा सकती। |

**Options :**

92090659369. 1  
92090659370. 2  
92090659371. 3  
92090659372. 4

**Question Number : 44 Question Id : 92090615026 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**



Two bodies of different masses are moving with the same kinetic energy. Which one has a greater momentum?

1. Body of greater mass will have the greater momentum
2. Body of lighter mass will have the greater momentum
3. Both bodies will have same momentum
4. Depending on initial conditions any body can have greater momentum

**Options :**

92090659373. 1

92090659374. 2

92090659375. 3

92090659376. 4

**Question Number : 44 Question Id : 92090615026 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

भिन्न-भिन्न द्रव्यमानों के गतिमान दो पिंडों की गतिज ऊर्जा समान है। किस पिंड का संवेग अधिक है?

- (1) अधिक द्रव्यमान के पिंड का संवेग अधिक होगा।
- (2) कम द्रव्यमान के पिंड का संवेग अधिक होगा।
- (3) दोनों पिंडों का संवेग समान होगा।
- (4) प्रारम्भिक दशाओं पर निर्भर करते हुए किसी भी पिंड का द्रव्यमान अधिक हो सकता है।

**Options :**

92090659373. 1

92090659374. 2

92090659375. 3

92090659376. 4

**Question Number : 45 Question Id : 92090615027 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

If the earth suddenly contracts to half its radius, what would be the length of the day?

1. Remain the same
2. 6 hours
3. 12 hours
4. 18 hours

**Options :**

92090659377. 1  
92090659378. 2  
92090659379. 3  
92090659380. 4

**Question Number : 45 Question Id : 92090615027 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

यदि पृथ्वी की त्रिज्या अचानक से संकुचित होकर अपनी त्रिज्या की आधी हो जाती है, तो एक दिन की लम्बाई क्या होगी ?

- |                |              |
|----------------|--------------|
| (1) समान रहेगी | (2) 6 hours  |
| (3) 12 hours   | (4) 18 hours |

**Options :**

92090659377. 1  
92090659378. 2  
92090659379. 3  
92090659380. 4

**Question Number : 46 Question Id : 92090615028 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The angular speed of a motor wheel is increased from 1200 r.p.m. to 3120 r.p.m. in 16 s. What is its angular acceleration?

1.  $\pi \text{ rad/s}^2$
2.  $2\pi \text{ rad/s}^2$
3.  $3\pi \text{ rad/s}^2$
4.  $4\pi \text{ rad/s}^2$

**Options :**

92090659381. 1  
92090659382. 2  
92090659383. 3  
92090659384. 4

**Question Number : 46 Question Id : 92090615028 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

किसी मोटर के पहिए की कोणीय चाल में 16 s में 1200 r.p.m. से 3120 r.p.m. की वृद्धि हो जाती है। इसका कोणीय त्वरण क्या है?

- |                            |                            |
|----------------------------|----------------------------|
| (1) $\pi \text{ rad/s}^2$  | (2) $2\pi \text{ rad/s}^2$ |
| (3) $3\pi \text{ rad/s}^2$ | (4) $4\pi \text{ rad/s}^2$ |

**Options :**

92090659381. 1  
92090659382. 2  
92090659383. 3  
92090659384. 4

**Question Number : 47 Question Id : 92090615029 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Given below are two statements :

Statement-I : In case of bi-prism, the coherent sources are produced by the phenomenon of refraction.

Statement-II : In case of Lloyd mirror, coherent sources are produced by the phenomenon of reflection.

In the light of the above statements, choose the *correct* answer from the options given below.

1. Both Statement-I and Statement-II are true
2. Both Statement-I and Statement-II are false
3. Statement-I is correct but Statement-II is false
4. Statement-I is incorrect but Statement-II is true

**Options :**

92090659385. 1  
92090659386. 2  
92090659387. 3  
92090659388. 4

**Question Number : 47 Question Id : 92090615029 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

नीचे दो कथन दिए गए हैं :

कथन I : द्वि-प्रिज्म में, कला संबद्ध स्रोत अपवर्तन की परिघटना द्वारा उत्पन्न किए जाते हैं।

कथन II : लॉयड दर्पण में, कला संबद्ध स्रोत परावर्तन की परिघटना द्वारा उत्पन्न किए जाते हैं।

उपरोक्त कथन के आलोक में, नीचे दिए गए विकल्पों में से सबसे उपयुक्त उत्तर का चयन कीजिए :

- (1) कथन I और II दोनों सही हैं
- (2) कथन I और II दोनों गलत हैं
- (3) कथन I सही है, लेकिन कथन II गलत है
- (4) कथन I गलत है, लेकिन कथन II सही है

**Options :**

92090659385. 1  
92090659386. 2  
92090659387. 3  
92090659388. 4

**Question Number : 48 Question Id : 92090615030 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

If two simple harmonic motions having angular frequency 440 rad/s and 396 rad/s are superimposed, what will be the number of beats produced?

1. 5 beats/s
2. 6 beats/s
3. 7 beats/s
4. 8 beats/s

**Options :**

92090659389. 1  
92090659390. 2  
92090659391. 3  
92090659392. 4

**Question Number : 48 Question Id : 92090615030 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

यदि दो सरल आवर्त गतियाँ कोणीय आवृत्ति क्रमशः 440 rad/s और 396 rad/s को अध्यारोपित किया जाता है तो उत्पन्न विस्पंदों की संख्या क्या होगी?

- |               |               |
|---------------|---------------|
| (1) 5 beats/s | (2) 6 beats/s |
| (3) 7 beats/s | (4) 8 beats/s |

**Options :**

92090659389. 1  
92090659390. 2  
92090659391. 3  
92090659392. 4

**Question Number : 49 Question Id : 92090615031 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

What will be the separation between the coherent sources formed by a bi-prism whose inclined faces makes an angle of  $2^\circ$  with its base, the slit source being 0.10 m away from the bi-prism (Given  $\mu = 1.5$ )?

1. 1.5 mm
2. 2.5 mm
3. 3.5 mm
4. 4.5 mm

**Options :**

92090659393. 1  
92090659394. 2  
92090659395. 3  
92090659396. 4

**Question Number : 49 Question Id : 92090615031 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

किसी द्विप्रिज्म द्वारा उत्पन्न कला संबद्ध स्रोतों के मध्य दूरी क्या होगी जिसके आनत सतह आधार से  $2^\circ$  का कोण बनाते हैं और झिरी स्रोत द्विप्रिज्म से 0.10 m की दूरी पर है। (दिया है  $\mu = 1.5$ )

- |            |            |
|------------|------------|
| (1) 1.5 mm | (2) 2.5 mm |
| (3) 3.5 mm | (4) 4.5 mm |

**Options :**

92090659393. 1  
92090659394. 2  
92090659395. 3  
92090659396. 4

**Question Number : 50 Question Id : 92090615032 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

A grating has 15 cm of the surface ruled with 6000 lines per cm. What is the Dispersive power of grating at the angle of  $\theta = 60^\circ$  in the first order?

1. 8000 rad/m
2. 20000 rad/m
3. 8000 rad/cm
4. 2000 rad/cm

**Options :**

- 92090659397. 1
- 92090659398. 2
- 92090659399. 3
- 92090659400. 4

**Question Number : 50 Question Id : 92090615032 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

किसी ग्रेटिंग की 15 cm की सतह पर 6000 लाइनें प्रति सेंटीमीटर खींची गई हैं। ग्रेटिंग की प्रथम कोटि में विक्षेपी क्षमता क्या है?

- (1) 8000 rad/m
- (2) 20000 rad/m
- (3) 8000 rad/cm
- (4) 2000 rad/cm

**Options :**

- 92090659397. 1
- 92090659398. 2
- 92090659399. 3
- 92090659400. 4

**Question Number : 51 Question Id : 92090615033 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The Lissajous figure of two rectangular SHMs of equal frequency and phase difference of  $\pi/2$  is

- 1. straight line
- 2. circle
- 3. ellipse
- 4. parabola

**Options :**

- 92090659401. 1
- 92090659402. 2
- 92090659403. 3
- 92090659404. 4

**Question Number : 51 Question Id : 92090615033 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

समान आवृत्ति और कलांतर  $\pi/2$  की दो आयताकार SHMs की लिसाजू की आकृति है।

- |                |           |
|----------------|-----------|
| (1) सरल रेखा   | (2) वृत्त |
| (3) दीर्घवृत्त | (4) परवलय |

**Options :**

- 92090659401. 1
- 92090659402. 2
- 92090659403. 3
- 92090659404. 4

**Question Number : 52 Question Id : 92090615034 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

What is the phase change for a light of wavelength 5000 Å, passing through a glass plate, if the refractive index of the glass plate is changed from  $\mu_0 = 1.5418$  to  $\mu = 1.5508$ .

- 1. 3.14 radian
- 2. 6.28 radian
- 3. 36.17 radian
- 4. 3.617 radian

**Options :**

- 92090659405. 1
- 92090659406. 2
- 92090659407. 3
- 92090659408. 4

**Question Number : 52 Question Id : 92090615034 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

0.032 mm मोटी काँच की प्लेट से 5000 Å तरंगदैर्घ्य के प्रकाश को गुजारने पर कला मंदन क्या है जब कि अपवर्तनांक  $\mu_0 = 1.5418$  वाली काँच की प्लेट को अपवर्तनांक  $\mu = 1.5508$  वाली काँच की प्लेट से बदल दिया गया है?

- |               |               |
|---------------|---------------|
| (1) 3.14 rad  | (2) 6.28 rad  |
| (3) 36.17 rad | (4) 3.617 rad |

**Options :**



- 92090659405. 1
- 92090659406. 2
- 92090659407. 3
- 92090659408. 4

**Question Number : 53 Question Id : 92090615035 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Angular width of central maxima of a diffraction pattern of a single slit does not depend upon

- 1. wavelength of light
- 2. frequency of light
- 3. distance between slit and source
- 4. width of the slit

**Options :**

- 92090659409. 1
- 92090659410. 2
- 92090659411. 3
- 92090659412. 4

**Question Number : 53 Question Id : 92090615035 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

एकल झिरी विवर्तन पैटर्न के केन्द्रीय उच्चिष्ठ की कोणीय चौड़ाई निर्भर नहीं करती है।

- (1) प्रकाश की तरंगदैर्घ्य
- (2) प्रकाश की आवृत्ति
- (3) स्रोत और झिरी के बीच दूरी
- (4) झिरी की चौड़ाई

**Options :**

- 92090659409. 1
- 92090659410. 2
- 92090659411. 3
- 92090659412. 4

**Question Number : 54 Question Id : 92090615036 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The Lissajous figure may be a straight line if the phase difference is

1. 0 or  $\pi$
2.  $\pi/4$
3.  $\pi/2$
4.  $\pi/3$

**Options :**

92090659413. 1  
92090659414. 2  
92090659415. 3  
92090659416. 4

**Question Number : 54 Question Id : 92090615036 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

लिसाजू की आकृति एक सरल रेखा हो सकती है यदि कलांतर है

- |                  |             |
|------------------|-------------|
| (1) 0 अथवा $\pi$ | (2) $\pi/4$ |
| (3) $\pi/2$      | (4) $\pi/3$ |

**Options :**

92090659413. 1  
92090659414. 2  
92090659415. 3  
92090659416. 4

**Question Number : 55 Question Id : 92090615037 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

If  $I_0$  is the intensity of the principal maxima in a single slit diffraction pattern, then what will be its intensity when the slit width is doubled?

1.  $I_0/2$
2.  $I_0$
3.  $2I_0$
4.  $4I_0$

**Options :**

- 92090659417. 1
- 92090659418. 2
- 92090659419. 3
- 92090659420. 4

**Question Number : 55 Question Id : 92090615037 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

एकल झिरी विवर्तन पैटर्न में यदि केन्द्रीय उच्चिष्ठ की तीव्रता  $I_0$  है तो झिरी की चौड़ाई दुगुनी करने पर इसकी तीव्रता कितनी होगी ?

- |             |            |
|-------------|------------|
| (1) $I_0/2$ | (2) $I_0$  |
| (3) $2I_0$  | (4) $4I_0$ |

**Options :**

- 92090659417. 1
- 92090659418. 2
- 92090659419. 3
- 92090659420. 4

**Question Number : 56 Question Id : 92090615038 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The kinetic energy of a particle executing simple harmonic motion is

- A. maximum at equilibrium position
- B. constant
- C. minimum at extremes positions
- D. zero
- E. negative

Choose the correct answer from the options given below.

- 1. A and C only
- 2. B only
- 3. C and D only
- 4. E only

**Options :**

- 92090659421. 1

92090659422. 2

92090659423. 3

92090659424. 4

**Question Number : 56 Question Id : 92090615038 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

सरल आवर्त गति करते हुए किसी कण की गतिज ऊर्जा है

- (A) साम्यावस्था स्थिति में अधिकतम
- (B) स्थिर
- (C) सिरों की स्थिति पर न्यूनतम
- (D) शून्य
- (E) ऋणात्मक

नीचे दिए गए विकल्पों में से सही उत्तर का चयन कीजिए :

- (1) केवल (A) और (C)
- (2) केवल (B)
- (3) केवल (C) और (D)
- (4) केवल (E)

**Options :**

92090659421. 1

92090659422. 2

92090659423. 3

92090659424. 4

**Question Number : 57 Question Id : 92090615039 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Given  $\vec{A} \times \vec{B} = \vec{C}$ ,

Where  $\vec{A} = x\hat{i} + y\hat{j} + 3\hat{k}$ ,  $\vec{B} = y\hat{i} + x\hat{j} + 2\hat{k}$ ,  $\vec{C} = -5\hat{i} + 5\hat{k}$

Find the value of  $x$  and  $y$

1.  $x = 2, y = 3$
2.  $x = 3, y = 2$
3.  $x = 1, y = 3$
4.  $x = 2, y = 1$

**Options :**

92090659425. 1  
92090659426. 2  
92090659427. 3  
92090659428. 4

**Question Number : 57 Question Id : 92090615039 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

यदि  $\vec{A} \times \vec{B} = \vec{C}$ ,  $\vec{A} = x\hat{i} + y\hat{j} + 3\hat{k}$ ,  $\vec{B} = y\hat{i} + x\hat{j} + 2\hat{k}$ ,  $\vec{C} = -5\hat{i} + 5\hat{k}$

$x$  और  $y$  का मान

- |                    |                    |
|--------------------|--------------------|
| (1) $x = 2, y = 3$ | (2) $x = 3, y = 2$ |
| (3) $x = 1, y = 3$ | (4) $x = 2, y = 1$ |

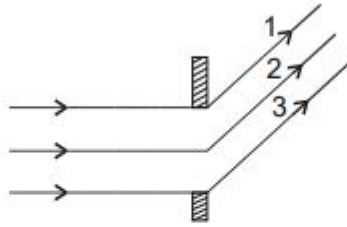
**Options :**

92090659425. 1  
92090659426. 2  
92090659427. 3  
92090659428. 4

**Question Number : 58 Question Id : 92090615040 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Figure shows Fraunhofer's diffraction due to a single slit. If first minima is obtained in the direction shown, then the path difference between ray 1 and ray 3 is



1.  $\lambda/3$
2.  $\lambda/2$
3.  $\lambda$
4. zero

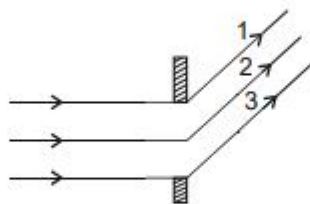
**Options :**

92090659429. 1  
 92090659430. 2  
 92090659431. 3  
 92090659432. 4

**Question Number : 58 Question Id : 92090615040 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

नीचे दिया गया चित्र एकल झिरी फ्रानहोफर विवर्तन दर्शाता है। यदि प्रथम निम्निष्ठ दर्शाई गई दिशा में प्राप्त किया गया है, तो किरण 1 और 3 के मध्य पथांतर है



- |                 |                 |
|-----------------|-----------------|
| (1) $\lambda/3$ | (2) $\lambda/2$ |
| (3) $\lambda$   | (4) शून्य       |

**Options :**

92090659429. 1  
 92090659430. 2  
 92090659431. 3  
 92090659432. 4

**Question Number : 59 Question Id : 92090615041 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

In the given question, choose the correct sequence of four statements given below :

- A. It was found that the charge determined in each case
- B. Which reveals that charge is quantised
- C. When the experiment was repeated for a number of times
- D. Was an integral multiple of elementary charge.

Choose the correct answer from the options given below.

- 1. (A), (B), (D), (C)
- 2. (C), (A), (D), (B)
- 3. (D), (B), (A), (C)
- 4. (C), (A), (B), (D)

**Options :**

92090659433. 1

92090659434. 2

92090659435. 3

92090659436. 4

**Question Number : 59 Question Id : 92090615041 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

नीचे दिए गए चार कथनों का सही क्रम चुनिए:

- (A) यह पाया गया कि आवेश प्रत्येक स्थिति में निर्धारित किया गया।
- (B) जो दर्शाता है कि आवेश क्वांटिकृत है।
- (C) जब प्रयोग को कई बार दोहराया गया।
- (D) मूल आवेश का पूर्णांक गुणज था।

नीचे दिए गए विकल्पों में से सही उत्तर का चयन कीजिए :

- (1) (A), (B), (D), (C)
- (2) (C), (A), (D), (B)
- (3) (D), (B), (A), (C)
- (4) (C), (A), (B), (D)

**Options :**

- 92090659433. 1
- 92090659434. 2
- 92090659435. 3
- 92090659436. 4

**Question Number : 60 Question Id : 92090615042 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Given below are two statements :

Statements—I : Important characteristic of electromagnetic wave is that it can transport energy from one point to another point.

Statements—II : The direction of electromagnetic wave at a given point is the direction in which energy is being transmitted.

In the light of the above statements, choose the *correct* answer from the options given below.

- 1. Both Statement—I and Statement—II are true
- 2. Both Statement—I and Statement—II are false
- 3. Statement—I is correct but Statement—II is false
- 4. Statement—I is incorrect but Statement—II is true

**Options :**



92090659437. 1  
92090659438. 2  
92090659439. 3  
92090659440. 4

**Question Number : 60 Question Id : 92090615042 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

नीचे दो कथन दिए गए हैं :

कथन I : वैद्युतचुम्बकीय तरंग की मुख्य विशेषता है कि यह एक स्थान से दूसरे स्थान तक ऊर्जा वहन कर सकती है।

कथन II : किस दिए गए बिन्दु पर वैद्युतचुम्बकीय तरंग की दिशा वह दिशा है जिसमें ऊर्जा संचारित होती है।

उपरोक्त कथन के आलोक में, नीचे दिए गए विकल्पों में से सबसे उपयुक्त उत्तर का चयन कीजिए :

- (1) कथन I और II दोनों सही हैं
- (2) कथन I और II दोनों गलत हैं
- (3) कथन I सही है, लेकिन कथन II गलत है
- (4) कथन I गलत है, लेकिन कथन II सही है

**Options :**

92090659437. 1  
92090659438. 2  
92090659439. 3  
92090659440. 4

**Question Number : 61 Question Id : 92090615043 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The relative magnitude of  $\vec{H}$  in a plane wave is  $1 A m^{-1}$ . What will be the magnitude of  $\vec{E}$  for a plane wave in free space?

1. 3760 V/m
2. 3.760 V/m
3. 37.60 V/m
4. 376.0 V/m

**Options :**

- 92090659441. 1
- 92090659442. 2
- 92090659443. 3
- 92090659444. 4

**Question Number : 61 Question Id : 92090615043 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

किसी समतल तरंग में  $\vec{H}$  का सापेक्ष परिमाण  $1 A m^{-1}$  है। मुक्त स्थान में समतल तरंग के  $\vec{E}$  का परिमाण क्या होगा ?

- (1) 3760 V/m
- (2) 3.760 V/m
- (3) 37.60 V/m
- (4) 376.0 V/m

**Options :**

- 92090659441. 1
- 92090659442. 2
- 92090659443. 3
- 92090659444. 4

**Question Number : 62 Question Id : 92090615044 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

If magnetic monopole existed, then which of the following Maxwell's equations will be modified?

- 1.  $\text{div } \vec{D} = \rho$
- 2.  $\text{div } \vec{B} = 0$
- 3.  $\text{curl } \vec{E} = -\frac{\partial \vec{B}}{\partial t}$
- 4.  $\text{curl } \vec{H} = \vec{J} + \frac{\partial \vec{D}}{\partial t}$

**Options :**

- 92090659445. 1
- 92090659446. 2
- 92090659447. 3
- 92090659448. 4

**Question Number : 62 Question Id : 92090615044 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

यदि चुंबकीय एक ध्रुव का अस्तित्व होता, तो निम्नलिखित मेक्सवेल के समीकरणों में से किस समीकरण को परिवर्तित करना पड़ेगा?

(1)  $\text{div } \vec{D} = \rho$

(2)  $\text{div } \vec{B} = 0$

(3)  $\text{curl } \vec{E} = -\frac{\partial \vec{B}}{\partial t}$

(4)  $\text{curl } \vec{H} = \vec{J} + \frac{\partial \vec{D}}{\partial t}$

**Options :**

92090659445. 1

92090659446. 2

92090659447. 3

92090659448. 4

**Question Number : 63 Question Id : 92090615045 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

When a charge particle moves in a uniform magnetic field, its kinetic energy

1. goes on increasing
2. goes on decreasing
3. remains unchanged
4. may increase or decrease depending upon the sign of charge

**Options :**

92090659449. 1

92090659450. 2

92090659451. 3

92090659452. 4

**Question Number : 63 Question Id : 92090615045 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

जब एक आवेशित कण एक समान चुंबकीय क्षेत्र में गति करता है, तब इसकी गतिज ऊर्जा में

- (1) वृद्धि होती जाती है।
- (2) कमी होती जाती है।
- (3) अपरिवर्तित रहती है।
- (4) आवेश के चिन्ह पर निर्भर करते घट या बढ़ सकती है।

**Options :**

92090659449. 1  
92090659450. 2  
92090659451. 3  
92090659452. 4

**Question Number : 64 Question Id : 92090615046 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The relative permittivity of distilled water is 81. What is the velocity of light in the distilled water?

1.  $1.1 \times 10^7$  m/s
2.  $2.2 \times 10^7$  m/s
3.  $3.3 \times 10^7$  m/s
4.  $3 \times 10^8$  m/s

**Options :**

92090659453. 1  
92090659454. 2  
92090659455. 3  
92090659456. 4

**Question Number : 64 Question Id : 92090615046 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

आसुत जल का सापेक्ष परावैद्युतांक 81 है। आसुत जल में प्रकाश का वेग क्या है?

- |                           |                           |
|---------------------------|---------------------------|
| (1) $1.1 \times 10^7$ m/s | (2) $2.2 \times 10^7$ m/s |
| (3) $3.3 \times 10^7$ m/s | (4) $3 \times 10^8$ m/s   |

**Options :**

92090659453. 1

92090659454. 2

92090659455. 3

92090659456. 4

**Question Number : 65 Question Id : 92090615047 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Given below are two statements, one is labelled as Assertion (A) and the other is labelled as Reason (R) :

Assertion (A) : All points inside a charged hollow spherical conducting sphere are at equal potential.

Reason (R) : The electric field inside a charged hollow spherical conducting sphere is non-zero.

In the light of the above statements, choose the *correct answer* from the options given below.

1. Both (A) and (R) are true and (R) is the correct explanation of (A)
2. Both (A) and (R) are true but (R) is not the correct explanation of (A)
3. (A) is true but (R) is false
4. (A) is false but (R) is true

**Options :**

92090659457. 1

92090659458. 2

92090659459. 3

92090659460. 4

**Question Number : 65 Question Id : 92090615047 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

नीचे दो कथन दिए गए हैं : एक अभिकथन (Assertion (A)) के रूप में लिखित है तो दूसरा उसके कारण (Reasons (R)) के रूप में :

अभिकथन (A) : किसी आवेशित खोखले गोलीय चालक कोश के भीतर सभी बिन्दुओं पर विभव समान है।

कारण (R) : किसी आवेशित खोखले चालक कोश के भीतर विद्युत क्षेत्र शून्यतर है।

उपरोक्त कथन के आलोक में, नीचे दिए गए विकल्पों में से सबसे उपयुक्त उत्तर का चयन कीजिए

- (1) (A) और (R) दोनों सही हैं और (R), (A) की सही व्याख्या है
- (2) (A) और (R) दोनों सही हैं, लेकिन (R), (A) की सही व्याख्या नहीं है
- (3) (A) सही है, लेकिन (R) सही नहीं है
- (4) (A) सही नहीं है, लेकिन (R) सही है

**Options :**

92090659457. 1
92090659458. 2
92090659459. 3
92090659460. 4

**Question Number : 66 Question Id : 92090615048 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The time period of oscillation of the charge in a circuit containing inductance ( $L$ ) and capacitance ( $C$ ) only is

1.  $\frac{1}{2\pi\sqrt{LC}}$
2.  $\frac{2\pi}{\sqrt{LC}}$
3.  $\frac{\sqrt{LC}}{2\pi}$
4.  $2\pi\sqrt{LC}$

**Options :**

92090659461. 1
92090659462. 2
92090659463. 3
92090659464. 4

**Question Number : 66 Question Id : 92090615048 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

एक प्रेरक ( $L$ ) और एक संधारित्र जिसकी धारिता ( $C$ ) है, युक्त विद्युत परिपथ में आवेश के दोलन का आवर्तकाल है।

(1)  $\frac{1}{2\pi\sqrt{LC}}$

(2)  $\frac{2\pi}{\sqrt{LC}}$

(3)  $\frac{\sqrt{LC}}{2\pi}$

(4)  $2\pi\sqrt{LC}$

**Options :**

92090659461. 1

92090659462. 2

92090659463. 3

92090659464. 4

**Question Number : 67 Question Id : 92090615049 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The self-inductance of a solenoid is

1. directly proportional to the current in the solenoid
2. inversely proportional to the length of the solenoid
3. directly proportional to the cross-sectional area of the solenoid
4. inversely proportional to the cross-sectional area of the solenoid

**Options :**

92090659465. 1

92090659466. 2

92090659467. 3

92090659468. 4

**Question Number : 67 Question Id : 92090615049 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

किसी परिनालिका का स्व-प्रेरकत्व है

- (1) परिनालिका में धारा के समानुपाती
- (2) परिनालिका की लम्बाई के व्युत्क्रमानुपाती
- (3) परिनालिका के अनुप्रस्थ काट के क्षेत्रफल के समानुपाती
- (4) परिनालिका के अनुप्रस्थ काट के क्षेत्रफल के व्युत्क्रमानुपाती

**Options :**

92090659465. 1  
92090659466. 2  
92090659467. 3  
92090659468. 4

**Question Number : 68 Question Id : 92090615050 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

A solenoid of length 30 cm is wound uniformly with 3000 turns of wire. The wire carries a current of 10 A. What is the value of  $\vec{B}$  on the axis within the solenoid?

$[\mu_0 = 4\pi \times 10^{-7} \text{ T m / A}]$

1. 0.126 T
2. 1.26 T
3. 12.6 T
4. 0 T

**Options :**

92090659469. 1  
92090659470. 2  
92090659471. 3  
92090659472. 4

**Question Number : 68 Question Id : 92090615050 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

किसी परिनालिका की 30 cm लम्बाई में तार के 3000 एक समान फेरे हैं। तार में प्रवाहित धारा का मान 10 A है। परिनालिका के भीतर अक्ष पर चुंबकीय क्षेत्र  $\vec{B}$  का मान क्या है?  $[\mu_0 = 4\pi \times 10^{-7} \text{ T m / A}]$

- |             |            |
|-------------|------------|
| (1) 0.126 T | (2) 1.26 T |
| (3) 12.6 T  | (4) 0 T    |



**Options :**

- 92090659469. 1
- 92090659470. 2
- 92090659471. 3
- 92090659472. 4

**Question Number : 69 Question Id : 92090615051 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

What will be potential and field due to a dipole of dipole moment  $4.5 \times 10^{-10}$  Cm at a distance from 1 m from the center of the dipole along its axis?

- 1. 4.05 V and 8.1 V/m
- 2. 4.05 V and 10.1 V/m
- 3. 6.05 V and 8.1 V/m
- 4. 6.05 V and 10.1 V/m

**Options :**

- 92090659473. 1
- 92090659474. 2
- 92090659475. 3
- 92090659476. 4

**Question Number : 69 Question Id : 92090615051 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

एक वैद्युत द्विध्रुव जिसका द्विध्रुव आघूर्ण  $4.5 \times 10^{-10}$  Cm है। इसके कारण द्विध्रुव के केन्द्र से अक्ष के अनुदिश 1 m की दूरी पर विभव एवं विद्युत क्षेत्र का मान क्या होगा?

- (1) 4.05 V और 8.1 V/m
- (2) 4.05 V और 10.1 V/m
- (3) 6.05 V और 8.1 V/m
- (4) 6.05 V और 10.1 V/m

**Options :**

- 92090659473. 1
- 92090659474. 2
- 92090659475. 3
- 92090659476. 4

**Question Number : 70 Question Id : 92090615052 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

A parallel plate capacitor consists of two square metal plates 5.0 cm of side and separated by 1 cm. A sulphur slab of thickness 5 mm is placed on the lower plate. What will be the capacitance of the capacitor? (Dielectric constant of sulphur = 4)

1.  $2.5 \times 10^{-12}$  F
2.  $3.5 \times 10^{-12}$  F
3.  $4.5 \times 10^{-12}$  F
4.  $5.5 \times 10^{-12}$  F

**Options :**

92090659477. 1  
92090659478. 2  
92090659479. 3  
92090659480. 4

**Question Number : 70 Question Id : 92090615052 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

किसी समांतर पट्टिका संधारित्र में दो वर्गाकार 5.0 cm भुजा वाली धात्विय पट्टिकाएं 1 cm दूरी पर रखी गई हैं। 5 mm मोटाई की एक सल्फर की स्लैब निचली पट्टिका पर रखी गई है। संधारित्र की धारिता क्या होगी ?

(सल्फर का परावैद्युतांक = 4)

- |                             |                             |
|-----------------------------|-----------------------------|
| (1) $2.5 \times 10^{-12}$ F | (2) $3.5 \times 10^{-12}$ F |
| (3) $4.5 \times 10^{-12}$ F | (4) $5.5 \times 10^{-12}$ F |

**Options :**

92090659477. 1  
92090659478. 2  
92090659479. 3  
92090659480. 4

**Question Number : 71 Question Id : 92090615053 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The change in entropy ( $\Delta S$ ) for a reversible adiabatic process is

1.  $\Delta S > 0$
2.  $\Delta S = 0$
3.  $\Delta S < 0$
4.  $\Delta S > 0$  and  $\Delta S < 0$

**Options :**

92090659481. 1  
92090659482. 2  
92090659483. 3  
92090659484. 4

**Question Number : 71 Question Id : 92090615053 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

किसी उत्क्रमणीय रूद्धोष्म प्रक्रम में एंट्रॉपी ( $\Delta S$ ) में परिवर्तन है

- |                    |                                      |
|--------------------|--------------------------------------|
| (1) $\Delta S > 0$ | (2) $\Delta S = 0$                   |
| (3) $\Delta S < 0$ | (4) $\Delta S > 0$ और $\Delta S < 0$ |

**Options :**

92090659481. 1  
92090659482. 2  
92090659483. 3  
92090659484. 4

**Question Number : 72 Question Id : 92090615054 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The r.m.s. speed of hydrogen atom at room temperature (300 K) is 2000 m/s. What is the r.m.s. speed of hydrogen atom on the surface of sun where temperature is  $T = 2 \times 10^6$  K ?

1. 164 m/s
2. 1640 m/s
3. 164000 m/s
4. 16400 m/s

**Options :**

92090659485. 1  
92090659486. 2  
92090659487. 3  
92090659488. 4

**Question Number : 72 Question Id : 92090615054 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

किसी हाइड्रोजन परमाणु की कमरे के तापमान (300 K) पर r.m.s. चाल 2000 m/s है। उसी हाइड्रोजन परमाणु की सूर्य की सतह पर r.m.s. चाल क्या होगी? जहाँ का तापमान  $T = 2 \times 10^6$  K है?

- |                |               |
|----------------|---------------|
| (1) 164 m/s    | (2) 1640 m/s  |
| (3) 164000 m/s | (4) 16400 m/s |

**Options :**

92090659485. 1  
92090659486. 2  
92090659487. 3  
92090659488. 4

**Question Number : 73 Question Id : 92090615055 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

In Fermi-Dirac statistics, the particles are

1. indistinguishable and obey Pauli exclusion principle with half integer spin angular momentum
2. indistinguishable with integral spin angular momentum
3. distinguishable with integral spin angular momentum
4. indistinguishable and do not obey Pauli exclusion principle

**Options :**

92090659489. 1  
92090659490. 2  
92090659491. 3  
92090659492. 4

**Question Number : 73 Question Id : 92090615055 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

फर्मी-डिराक सांख्यिकी में कण हैं

- (1) अविभेद्य और पाउली अपवर्जन सिद्धान्त के साथ अर्द्ध पूर्णांक चक्रण कोणीय संवेग का पालन करते हैं।
- (2) अर्द्धपूर्णांक चक्रण कोणीय संवेग के साथ अविभेद्य।
- (3) अर्द्धपूर्णांक चक्रण कोणीय संवेग के साथ विभेद्य।
- (4) अविभेद्य और पाउली अपवर्जन सिद्धान्त का पालन नहीं करते हैं।

**Options :**

92090659489. 1  
92090659490. 2  
92090659491. 3  
92090659492. 4

**Question Number : 74 Question Id : 92090615056 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

What is the relation between Boyle temperature ( $T_B$ ) and critical temperature ( $T_C$ ) of a gas?

1.  $T_B = \frac{27}{8}T_C$

2.  $2T_B = \frac{8}{27}T_C$

3.  $T_B = \frac{3}{7}T_C$

4.  $3T_B = 2T_C$

**Options :**

92090659493. 1

92090659494. 2

92090659495. 3

92090659496. 4

**Question Number : 74 Question Id : 92090615056 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

किसी गैस के बॉयल ताप ( $T_B$ ) और क्रान्तिक ताप ( $T_C$ ) में क्या संबंध है?

(1)  $T_B = \frac{27}{8}T_C$

(2)  $2T_B = \frac{8}{27}T_C$

(3)  $T_B = \frac{3}{7}T_C$

(4)  $3T_B = 2T_C$

**Options :**

92090659493. 1

92090659494. 2

92090659495. 3

92090659496. 4

**Question Number : 75 Question Id : 92090615057 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

What is the change in entropy when 10 g of ice at 0 °C is converted into water at the same temperature? The latent heat of ice is 80 cal/g.

1. 0 cal/K
2. 2.93 cal/K
3. 29.3 cal/K
4. 293 cal/K

**Options :**

92090659497. 1  
92090659498. 2  
92090659499. 3  
92090659500. 4

**Question Number : 75 Question Id : 92090615057 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

जब 10 g, 0 °C ताप पर बर्फ उसी ताप के जल में रूपांतरित होती है तब उसकी एंट्रॉपी में क्या परिवर्तन होगा? बर्फ की गुप्त ऊष्मा 80 cal/g है।

- |                |                |
|----------------|----------------|
| (1) 0 cal/K    | (2) 2.93 cal/K |
| (3) 29.3 cal/K | (4) 293 cal/K  |

**Options :**

92090659497. 1  
92090659498. 2  
92090659499. 3  
92090659500. 4

**Question Number : 76 Question Id : 92090615058 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Five Carnot engines operate between reservoir temperatures of

- A. 100 K and 500 K
- B. 200 K and 500 K
- C. 400 K and 500 K
- D. 200 K and 800 K
- E. 200 K and 400 K

Arrange the engines according to their decreasing efficiencies.

Choose the correct answer from the options given below.

- 1. B, C, D, A, E
- 2. A, D, B, E, C
- 3. A, B, C, D, E
- 4. A, E, B, C, D

**Options :**

- 92090659501. 1
- 92090659502. 2
- 92090659503. 3
- 92090659504. 4

**Question Number : 76 Question Id : 92090615058 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**



पाँच कार्नोट इंजन हौज के तापमानों के मध्य परिचालन करते हैं इन इंजनों को घटती हुई क्षमताओं के क्रम में लिखिए:

- (A) 100 K और 500 K
- (B) 200 K और 500 K
- (C) 400 K और 500 K
- (D) 200 K और 800 K
- (E) 200 K और 400 K

नीचे दिए गए विकल्पों में से सही उत्तर का चयन कीजिए :

- (1) (B), (C), (D), (A), (E)
- (2) (A), (D), (B), (E), (C)
- (3) (A), (B), (C), (D), (E)
- (4) (A), (E), (B), (C), (D)

**Options :**

- 92090659501. 1
- 92090659502. 2
- 92090659503. 3
- 92090659504. 4

**Question Number : 77 Question Id : 92090615059 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

$C_1$  and  $C_2$  represent the specific heat of a liquid and its saturated vapour whereas  $L$  is latent heat of vaporization. ( $T$  is the temperature) The correct option is

- 1.  $C_2 - C_1 = \frac{dL}{dT} - \frac{L}{T}$
- 2.  $C_1 - C_2 = \frac{dL}{dT} + \frac{L}{T}$
- 3.  $C_1 + C_2 = \frac{dL}{dT} - \frac{L}{T}$
- 4.  $C_1 + C_2 = \frac{dL}{dT} + \frac{L}{T}$

**Options :**

92090659505. 1  
92090659506. 2  
92090659507. 3  
92090659508. 4

**Question Number : 77 Question Id : 92090615059 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

नीचे  $C_1, C_2, L$  और  $T$  से संबंधित सूत्र दिए गए हैं जिसमें  $C_1$  और  $C_2$  क्रमशः द्रव एवं इसकी संतृप्त वाष्प की विशिष्ट ऊष्मा, वाष्प की गुप्त ऊष्मा और  $T$  ताप है। सही विकल्प है :

- (1)  $C_2 - C_1 = \frac{dL}{dT} - \frac{L}{T}$                       (2)  $C_1 - C_2 = \frac{dL}{dT} + \frac{L}{T}$   
(3)  $C_1 + C_2 = \frac{dL}{dT} - \frac{L}{T}$                       (4)  $C_1 + C_2 = \frac{dL}{dT} + \frac{L}{T}$

**Options :**

92090659505. 1  
92090659506. 2  
92090659507. 3  
92090659508. 4

**Question Number : 78 Question Id : 92090615060 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The Bose-Einstein distribution is applied on

1. identical, distinguishable particles
2. identical, indistinguishable particles that do not obey exclusion principle
3. Identical, indistinguishable particles which obey exclusion principle
4. distinguishable particles which obey exclusion principle.

**Options :**

92090659509. 1  
92090659510. 2  
92090659511. 3  
92090659512. 4

**Question Number : 78 Question Id : 92090615060 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

बोस-आइन्सटाइन वितरण प्रयुक्त किया जाता है।

- (1) अभिन्न, विभेदय कणों पर
- (2) अभिन्न, अविभेदय कणों पर जो अपवर्जन सिद्धान्त का पालन नहीं करते हैं।
- (3) अभिन्न, अविभेदय कणों पर जो अपवर्जन सिद्धान्त का पालन करते हैं।
- (4) विभेदय कणों पर जो अपवर्जन सिद्धान्त का पालन करते हैं।

**Options :**

- 92090659509. 1
- 92090659510. 2
- 92090659511. 3
- 92090659512. 4

**Question Number : 79 Question Id : 92090615061 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Given below are two statements :

Statement-I : Law of conservation of momentum is invariant to Galilean transformation.

Statement—II : Law of conservation of energy is invariant to Galilean transformation.

In the light of the above statements, choose the *correct* answer from the options given below.

1. Both Statement-I and Statement-II are true
2. Both Statement-I and Statement-II are false
3. Statement-I is correct but Statement-II is false
4. Statement-I is incorrect but Statement-II is true

**Options :**

- 92090659513. 1
- 92090659514. 2
- 92090659515. 3
- 92090659516. 4

**Question Number : 79 Question Id : 92090615061 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

नीचे दो कथन दिए गए हैं :

कथन I : संवेग संरक्षण का नियम गैलीलियन रूपांतरण में निश्चर है।

कथन II : ऊर्जा संरक्षण का नियम गैलीनियन रूपांतरण में निश्चर है।

उपरोक्त कथन के आलोक में, नीचे दिए गए विकल्पों में से सबसे उपयुक्त उत्तर का चयन कीजिए :

- (1) कथन I और II दोनों सही हैं
- (2) कथन I और II दोनों गलत हैं
- (3) कथन I सही है, लेकिन कथन II गलत है
- (4) कथन I गलत है, लेकिन कथन II सही है

**Options :**

92090659513. 1  
92090659514. 2  
92090659515. 3  
92090659516. 4

**Question Number : 80 Question Id : 92090615062 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

What is the kinetic energy of an electron in the lowest energy level of a hydrogen atom?

1. 27.2 eV
2. 13.6 eV
3. 1.36 eV
4. 2.72 eV

**Options :**

92090659517. 1  
92090659518. 2  
92090659519. 3  
92090659520. 4

**Question Number : 80 Question Id : 92090615062 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

किसी हाइड्रोजन परमाणु की निम्नतम ऊर्जा अवस्था में एक इलेक्ट्रॉन की गतिज ऊर्जा क्या है?

- (1) 27.2 eV (2) 13.6 eV  
(3) 1.36 eV (4) 2.72 eV

**Options :**

92090659517. 1  
92090659518. 2  
92090659519. 3  
92090659520. 4

**Question Number : 81 Question Id : 92090615063 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

A white dwarf star has volume  $V$  and contains  $N$  electrons so that the density of electron is  $n = \frac{N}{V}$ . Taking the temperature of the star to be 0 K, what will be the expression for average energy per electron in the star?

1.  $\frac{3\hbar^2}{m}(3\pi^2n)^{3/2}$   
2.  $\frac{3\hbar^2}{10m}(3\pi^2n)^{2/3}$   
3.  $\frac{\hbar^2}{m}(3\pi^2n)^{2/3}$   
4.  $\frac{3\hbar^2}{10m}(3\pi^2n)^{1/3}$

**Options :**

92090659521. 1  
92090659522. 2  
92090659523. 3  
92090659524. 4

**Question Number : 81 Question Id : 92090615063 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

किसी वामन तारे का आयतन  $V$  है और जिसमें  $N$  इलेक्ट्रॉन हैं अतः इलेक्ट्रॉन की घनत्व  $n = \frac{N}{V}$  है। यदि तारे का तापमान  $0\text{ K}$  है, तो तारे में प्रति इलेक्ट्रॉन औसत ऊर्जा का व्यंजक क्या होगा ?

(1)  $\frac{3h^2}{m}(3\pi^2n)^{3/2}$

(2)  $\frac{3h^2}{10m}(3\pi^2n)^{2/3}$

(3)  $\frac{h^2}{m}(3\pi^2n)^{2/3}$

(4)  $\frac{3h^2}{10m}(3\pi^2n)^{1/3}$

**Options :**

92090659521. 1

92090659522. 2

92090659523. 3

92090659524. 4

**Question Number : 82 Question Id : 92090615064 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The de Broglie wavelength of an electron having kinetic energy of 100 eV is

1. 200 pm

2. 120 pm

3. 50 pm

4. 300 pm

**Options :**

92090659525. 1

92090659526. 2

92090659527. 3

92090659528. 4

**Question Number : 82 Question Id : 92090615064 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

एक इलेक्ट्रॉन जिसकी गतिज ऊर्जा 100 eV है की दे ब्रॉग्ली तरंगदैर्घ्य है।

(1) 200 pm

(2) 120 pm

(3) 50 pm

(4) 300 pm

**Options :**

92090659525. 1

92090659526. 2

92090659527. 3

92090659528. 4

**Question Number : 83 Question Id : 92090615065 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

A metal has work function  $w_0 = 3.3 \times 10^{-19}$  J. What should be the minimum frequency of the incident radiation that can remove an electron from the metal surface? [Given  $h = 6.6 \times 10^{-34}$  J-s]

1.  $5 \times 10^{10}$  Hz
2.  $5 \times 10^{12}$  Hz
3.  $5 \times 10^{14}$  Hz
4.  $5 \times 10^{15}$  Hz

**Options :**

92090659529. 1

92090659530. 2

92090659531. 3

92090659532. 4

**Question Number : 83 Question Id : 92090615065 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

किसी धातु का कार्य-फलन  $w_0 = 3.3 \times 10^{-19}$  J है। आपतित विकिरण की न्यूनतम आवृत्ति क्या होनी चाहिए जो धातु के पृष्ठ से एक इलेक्ट्रॉन उत्सर्जित कर सके? (दिया है :  $h = 6.6 \times 10^{-34}$  J-s)

- |                           |                           |
|---------------------------|---------------------------|
| (1) $5 \times 10^{10}$ Hz | (2) $5 \times 10^{12}$ Hz |
| (3) $5 \times 10^{14}$ Hz | (4) $5 \times 10^{15}$ Hz |

**Options :**

92090659529. 1

92090659530. 2

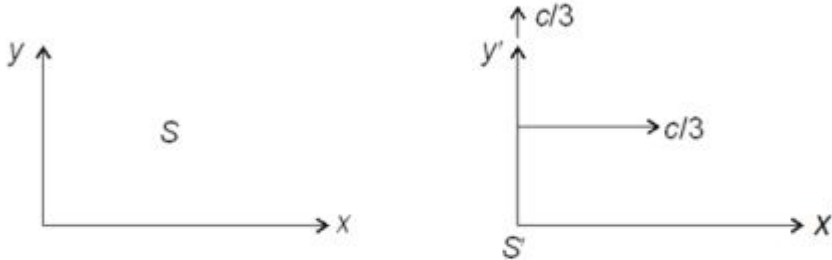
92090659531. 3

92090659532. 4

**Question Number : 84 Question Id : 92090615066 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Correct Marks : 4 Wrong Marks : 1

Consider an inertial frame  $S'$  moving at a speed  $\frac{c}{3}$  away from another inertial frame  $S$  along the common  $x$ -axis, where  $c$  is the speed of light. As observed from  $S'$ , a particle is moving with speed  $\frac{c}{3}$  in the  $y'$  direction as shown in the figure. The speed of the particle as seen from  $S$  will be



1.  $\frac{\sqrt{15}}{9}c$
2.  $\frac{\sqrt{17}}{9}c$
3.  $\frac{\sqrt{21}}{9}c$
4.  $\frac{\sqrt{18}}{9}c$

Options :

92090659533. 1

92090659534. 2

92090659535. 3

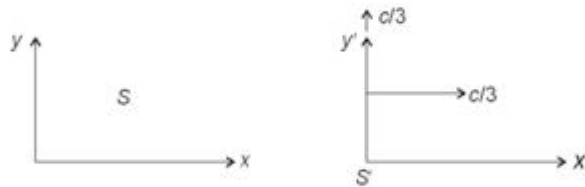
92090659536. 4

Question Number : 84 Question Id : 92090615066 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1



मान लीजिए कोई जड़त्वीय फ्रेम  $S'$ ,  $\frac{c}{3}$  चाल से उभयनिष्ठ  $x$ -अक्ष के अनुदिश दूसरे जड़त्वीय फ्रेम  $S$  से दूर गति कर रहा है वहाँ  $c$  प्रकाश की चाल है। जड़त्वीय फ्रेम  $S'$  से प्रेक्षण करने पर यह पाया गया कि एक कण,  $\frac{c}{3}$  चाल से  $y'$  दिशा में गतिमान है जैसा चित्र में दर्शाया गया है। फ्रेम  $S$  से अवलोकित कण की चाल होगी।



(1)  $\frac{\sqrt{15}}{9}c$

(2)  $\frac{\sqrt{17}}{9}c$

(3)  $\frac{\sqrt{21}}{9}c$

(4)  $\frac{\sqrt{18}}{9}c$

**Options :**

92090659533. 1

92090659534. 2

92090659535. 3

92090659536. 4

**Question Number : 85 Question Id : 92090615067 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

What will be drift velocity  $v_d$  of the free electron in a copper wire whose cross sectional area is  $A = 1.00 \text{ mm}^2$  when the wire carries a current of 1.0 A. Assume that each copper atom contributes 1 electron to the electron gas. (Given density of copper =  $8.94 \times 10^3 \text{ kg/m}^3$ , atomic mass of copper = 63.5 u,  $1 \text{ u} = 1.66 \times 10^{-27} \text{ kg}$ )

1.  $7.4 \times 10^{-5} \text{ m/s}$

2.  $7.4 \times 10^{-2} \text{ m/s}$

3.  $7.4 \times 10^{-7} \text{ m/s}$

4.  $7.4 \text{ m/s}$

**Options :**

92090659537. 1

92090659538. 2

92090659539. 3

92090659540. 4

**Question Number : 85 Question Id : 92090615067 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

किसी तांबे के तार में जिसका अनुप्रस्थ काट का क्षेत्रफल  $A = 1.00 \text{ mm}^2$  है में जब  $1.0 \text{ A}$  धारा प्रवाहित हो रही है तो इसमें मुक्त इलेक्ट्रॉनों की अपवाह वेग क्या होगी? मान लीजिए कि तांबे का प्रत्येक परमाणु इलेक्ट्रॉन गैस में एक इलेक्ट्रॉन का योगदान करता है। (दिया है: तांबे का घनत्व  $= 8.94 \times 10^3 \text{ kg/m}^3$ , तांबे का परमाणु द्रव्यमान  $= 63.5 \text{ u}$ ,  $1 \text{ u} = 1.66 \times 10^{-27} \text{ kg}$ )

- (1)  $7.4 \times 10^{-5} \text{ m/s}$  (2)  $7.4 \times 10^{-2} \text{ m/s}$   
(3)  $7.4 \times 10^{-7} \text{ m/s}$  (4)  $7.4 \text{ m/s}$

**Options :**

92090659537. 1  
92090659538. 2  
92090659539. 3  
92090659540. 4

**Question Number : 86 Question Id : 92090615068 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Given below are two statements :

Statements—I : Compton effect can be explained on the basis of wave nature of light.

Statements—II : Diffraction pattern of light can be explained on the basis of particle nature of light.

In the light of the above statements, choose the *correct* answer from the options given below.

1. Both Statement—I and Statement—II are true
2. Both Statement—I and Statement—II are false
3. Statement—I is correct but Statement—II is false
4. Statement—I is incorrect but Statement—II is true

**Options :**

92090659541. 1  
92090659542. 2  
92090659543. 3  
92090659544. 4

**Question Number : 86 Question Id : 92090615068 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

नीचे दो कथन दिए गए हैं :

कथन I : कॉम्पटन प्रभाव की प्रकाश की तरंग प्रकृति के आधार पर व्याख्या की जा सकती है।

कथन II : प्रकाश के विवर्तन पैटर्न की प्रकाश की कणीय प्रकृति के आधार पर व्याख्या की जा सकती है।

उपरोक्त कथन के आलोक में, नीचे दिए गए विकल्पों में से सबसे उपयुक्त उत्तर का चयन कीजिए :

- (1) कथन I और II दोनों सही हैं
- (2) कथन I और II दोनों गलत हैं
- (3) कथन I सही है, लेकिन कथन II गलत है
- (4) कथन I गलत है, लेकिन कथन II सही है

**Options :**

92090659541. 1

92090659542. 2

92090659543. 3

92090659544. 4

**Question Number : 87 Question Id : 92090615069 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

What is the relation between half life ( $T$ ) and decay constant ( $\lambda$ ) of a radioactive element?

1.  $T = 0.693 \lambda$

2.  $T = \frac{\lambda}{0.693}$

3.  $T = \frac{0.693}{\lambda}$

4.  $T = \frac{0.693}{\lambda^2}$

**Options :**

92090659545. 1

92090659546. 2

92090659547. 3

92090659548. 4

**Question Number : 87 Question Id : 92090615069 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

किसी रेडियोएक्टिव तत्व की अर्द्ध-आयु ( $T$ ) और विघटन-स्थिरांक ( $\lambda$ ) में क्या संबंध है?

(1)  $T = 0.693 \lambda$

(2)  $T = \frac{\lambda}{0.693}$

(3)  $T = \frac{0.693}{\lambda}$

(4)  $T = \frac{0.693}{\lambda^2}$

**Options :**

92090659545. 1

92090659546. 2

92090659547. 3

92090659548. 4

**Question Number : 88 Question Id : 92090615070 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Consider Rydberg (hydrogen-like) atoms in a highly excited state with  $n$  around 400. The wavelength of radiation coming out of these atoms for transitions to the adjacent levels in the range.

1. Gamma rays ( $\lambda \sim \text{pm}$ )
2. Ultra violet rays ( $\lambda \sim \text{nm}$ )
3. infrared rays ( $\lambda \sim \mu\text{m}$ )
4. radio frequency ( $\lambda \sim \text{m}$ )

**Options :**

92090659549. 1

92090659550. 2

92090659551. 3

92090659552. 4

**Question Number : 88 Question Id : 92090615070 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

मान लीजिए रिडबर्ग परमाणु (हाइड्रोजन-सदृश) अत्यधिक उत्तेजित अवस्था में है जिसमें  $n$  लगभग 400 है। इन परमाणुओं से निकटवर्ती स्तरों पर संक्रमण के दौरान उत्सर्जित विकिरण की तरंगदैर्घ्य की परास है।

- (1) गामा किरणें ( $\lambda \sim \text{pm}$ ) (2) पराबैंगनी तरंगें ( $\lambda \sim \text{nm}$ )  
(3) अवरक्त तरंगें ( $\lambda \sim \mu\text{m}$ ) (4) रेडियो तरंगें ( $\lambda \sim \text{m}$ )

**Options :**

92090659549. 1  
92090659550. 2  
92090659551. 3  
92090659552. 4

**Question Number : 89 Question Id : 92090615071 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

What is the mean life time ( $\bar{T}$ ) of a radioactive substance of which the decay constant ( $\lambda$ ) is  $4.28 \times 10^{-4}$  per year?

1. 584 years  
2. 1168 years  
3. 1619 years  
4. 2336 years

**Options :**

92090659553. 1  
92090659554. 2  
92090659555. 3  
92090659556. 4

**Question Number : 89 Question Id : 92090615071 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

किसी रेडियोएक्टिव पदार्थ जिसका क्षय-स्थिरांक ( $\lambda$ )  $4.28 \times 10^{-4}$  प्रतिवर्ष है, की औसत आयु ( $\bar{T}$ ) क्या है?

- (1) 584 years (2) 1168 years  
(3) 1619 years (4) 2336 years

**Options :**

92090659553. 1  
92090659554. 2

92090659555. 3

92090659556. 4

**Question Number : 90 Question Id : 92090615072 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The dispersion relation for electromagnetic waves travelling in a plasma is given by  $\omega^2 = c^2 k^2 - \omega_p^2$ , where  $c$  and  $\omega_p$  are constants. In this plasma, group velocity will be

1. proportional to but not equal to phase velocity
2. equal to the phase velocity
3. inversely proportional to the phase velocity
4. constant

**Options :**

92090659557. 1

92090659558. 2

92090659559. 3

92090659560. 4

**Question Number : 90 Question Id : 92090615072 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

प्लाज्मा में वैद्युतचुंबकीय प्रगामी तरंगों हेतु परिक्षेपण संबंध निम्न है  $\omega^2 = c^2 k^2 - \omega_p^2$

जहाँ  $c$  और  $\omega_p$  स्थिरांक हैं। इस प्लाज्मा में समूह वेग होगा।

- (1) समानुपाती परन्तु प्रावस्था वेग के बराबर नहीं।
- (2) प्रावस्था वेग के बराबर
- (3) प्रावस्था वेग के व्युत्क्रमानुपाती
- (4) स्थिर

**Options :**

92090659557. 1

92090659558. 2


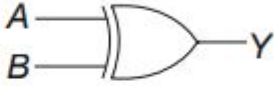
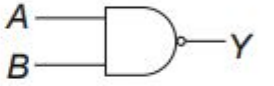
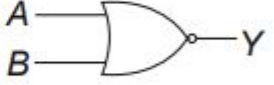
92090659559. 3

92090659560. 4

**Question Number : 91 Question Id : 92090615073 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Match List-I with List-II :

	List-I		List-II
(A)	NAND Gate	(I)	
(B)	NOR Gate	(II)	
(C)	X-NOR Gate	(III)	
(D)	XOR Gate	(IV)	

Choose the correct option from those given below.

1. (A)–(III); (B)–(IV); (C)–(II); (D)–(I)
2. (A)–(II); (B)–(I); (C)–(IV); (D)–(III)
3. (A)–(III); (B)–(IV); (C)–(I); (D)–(II)
4. (A)–(IV); (B)–(III); (C)–(I); (D)–(II)





**Options :**

92090659561. 1
92090659562. 2
92090659563. 3
92090659564. 4

**Question Number : 91 Question Id : 92090615073 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

सूची-I के साथ सूची-II का मिलान कीजिए :

सूची-I	सूची-II
(A) NAND गेट	(I) 
(B) NOR गेट	(II) 
(C) X-NOR गेट	(III) 
(D) XOR गेट	(IV) 

नीचे दिए गए विकल्पों में से सही उत्तर का चयन कीजिए :

- (1) (A)-(III), (B)-(IV), (C)-(II), (D)-(I)
- (2) (A)-(II), (B)-(I), (C)-(IV), (D)-(III)
- (3) (A)-(III), (B)-(IV), (C)-(I), (D)-(II)
- (4) (A)-(IV), (B)-(III), (C)-(I), (D)-(II)

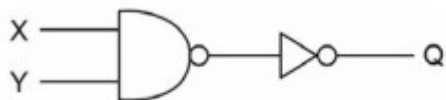
**Options :**

92090659561. 1
92090659562. 2
92090659563. 3
92090659564. 4

**Question Number : 92 Question Id : 92090615074 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The following logic circuit represents



1. NAND gate with output  $\theta = \bar{X} + \bar{Y}$
2. NOR gate with output  $\theta = \overline{X + Y}$
3. AND gate with output  $\theta = X.Y$
4. NOR gate with output  $\theta = \bar{X} + \bar{Y}$

**Options :**

92090659565. 1
92090659566. 2
92090659567. 3

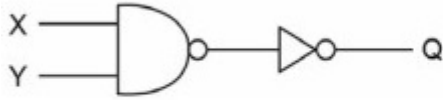


92090659568. 4

**Question Number : 92 Question Id : 92090615074 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

नीचे दिए गए लॉजिक परिपथ दर्शाता है



- (1) NAND गेट जिसका निर्गत है  $\theta = \bar{X} + \bar{Y}$  (2) NOR गेट जिसका निर्गत है  $\theta = \overline{X+Y}$   
(3) AND गेट जिसका निर्गत है  $\theta = X.Y$  (4) NOR गेट जिसका निर्गत है  $\theta = \bar{X} + \bar{Y}$

**Options :**

92090659565. 1  
92090659566. 2  
92090659567. 3  
92090659568. 4

**Question Number : 93 Question Id : 92090615075 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Find the shortest wavelength present in the radiation from an x-ray machine whose accelerating potential is 50000 V.

1. 0.0248 Å
2. 0.248 Å
3. 2.48 Å
4. 24.80 Å

**Options :**

92090659569. 1  
92090659570. 2  
92090659571. 3  
92090659572. 4

**Question Number : 93 Question Id : 92090615075 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

एक X-ray मशीन का त्वरण विभव 50,000 V है इस X-ray मशीन से उत्पादित विविकरण में लघुतम तरंग दैर्घ्य का मान \_\_\_\_\_ है:

- (1) 0.0248 Å (2) 0.248 Å  
(3) 2.48 Å (4) 24.80 Å

**Options :**

92090659569. 1  
92090659570. 2  
92090659571. 3  
92090659572. 4

**Question Number : 94 Question Id : 92090615076 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

What happens if the electron spin is  $3/2$  instead of  $1/2$ ?

1. The Bohr levels will change
2. The size of atoms will change
3. Energy will change
4. Atoms will not be stable

**Options :**

92090659573. 1  
92090659574. 2  
92090659575. 3  
92090659576. 4

**Question Number : 94 Question Id : 92090615076 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

क्या होता है यदि इलेक्ट्रॉन का चक्रण  $\frac{1}{2}$  के स्थान पर  $\frac{3}{2}$  होता ?

- (1) बोर के स्तरों में परिवर्तन होगा। (2) परमाणुओं के साइज में परिवर्तन होगा।  
(3) रासायनिक गुणधर्म में परिवर्तन होगा। (4) परमाणु स्थायी नहीं होंगे।

**Options :**

92090659573. 1  
92090659574. 2  
92090659575. 3  
92090659576. 4

**Question Number : 95 Question Id : 92090615077 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Operational amplifiers can be used as

- A. Summing circuit
- B. Voltage regulator
- C. Integrator
- D. Differentiator
- E. Clipping Circuit

Choose the correct answer from the options given below.

- 1. A and C only
- 2. C and D only
- 3. A, C and D only
- 4. A and E only

**Options :**

- 92090659577. 1
- 92090659578. 2
- 92090659579. 3
- 92090659580. 4

**Question Number : 95 Question Id : 92090615077 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

संक्रियात्मक प्रवर्धक निम्न तरह से काम में लाया जा सकता है।

- (A) एक संकलन परिपथ की तरह
- (B) एक वोल्टता नियंत्रक के रूप में
- (C) एक समाकलक के रूप में
- (D) एक अवकलक के रूप में
- (E) एक कर्तन परिपथ की तरह

नीचे दिए गए विकल्पों में से सही उत्तर का चयन कीजिए :

- (1) केवल (A) और (C)
- (2) केवल (C) और (D)
- (3) केवल (A), (C) और (D)
- (4) केवल (A) और (E)

**Options :**

- 92090659577. 1
- 92090659578. 2
- 92090659579. 3
- 92090659580. 4

**Question Number : 96 Question Id : 92090615078 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Given below are two statements :

Statement-I : We can join two  $P-N$  junctions back-to-back to form a transistor

Statement—II : In a transistor the emitter base junction is forward biased while base collector junction is reverse biased.

In the light of the above statements, choose the *correct* answer from the options given below.

1. Both Statement–I and Statement–II are true
2. Both Statement–I and Statement–II are false
3. Statement–I is correct but Statement–II is false
4. Statement–I is incorrect but Statement–II is true

**Options :**

92090659581. 1

92090659582. 2

92090659583. 3

92090659584. 4

**Question Number : 96 Question Id : 92090615078 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

नीचे दो कथन दिए गए हैं :

कथन I : ट्रांजिस्टर बनाने के लिए हम दो  $P-N$  संधियों को एक दूसरे के विपरीत संयोजित कर प्राप्त कर सकते हैं।

कथन II : किसी ट्रांजिस्टर में उत्सर्जक-आधार संधि अग्रदिशिक बायसित होती है जबकि आधार-संग्राही संधि पश्चदिशिक बायसित होती है।

उपरोक्त कथन के आलोक में, नीचे दिए गए विकल्पों में से सबसे उपयुक्त उत्तर का चयन कीजिए :

- (1) कथन I और II दोनों सही हैं
- (2) कथन I और II दोनों गलत हैं
- (3) कथन I सही है, लेकिन कथन II गलत है
- (4) कथन I गलत है, लेकिन कथन II सही है

**Options :**

92090659581. 1

92090659582. 2

92090659583. 3

92090659584. 4

**Question Number : 97 Question Id : 92090615079 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Electrons are accelerated by 344 volts and reflected from the crystal. The first reflection maximum occurs when glancing angle is  $30^\circ$ . What will be the value of interplanar spacing of the crystal? [Given  $h = 6.62 \times 10^{-34} \text{ Js}$ ,  $m_e = 9.1 \times 10^{-31} \text{ kg}$ ]

1.  $0.06 \times 10^{-10} \text{ m}$
2.  $0.66 \times 10^{-10} \text{ m}$
3.  $1.66 \times 10^{-10} \text{ m}$
4.  $2.66 \times 10^{-10} \text{ m}$

**Options :**

92090659585. 1

92090659586. 2

92090659587. 3

92090659588. 4

**Question Number : 97 Question Id : 92090615079 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

किसी क्रिस्टल से 344 वोल्ट के त्वरक विभव द्वारा इलेक्ट्रॉनों को परावर्तित कराया जाता है। जब पृष्ठसर्पी कोण  $30^\circ$  होता है तो प्रथम अधिकतम परावर्तन होता है। क्रिस्टल के अंतरातल अंतराल का मान क्या होगा?

(दिया है:  $h = 6.62 \times 10^{-34} \text{ Js}$ ,  $m_e = 9.1 \times 10^{-31} \text{ kg}$ )

- |                                      |                                      |
|--------------------------------------|--------------------------------------|
| (1) $0.06 \times 10^{-10} \text{ m}$ | (2) $0.66 \times 10^{-10} \text{ m}$ |
| (3) $1.66 \times 10^{-10} \text{ m}$ | (4) $2.66 \times 10^{-10} \text{ m}$ |

**Options :**

92090659585. 1

92090659586. 2

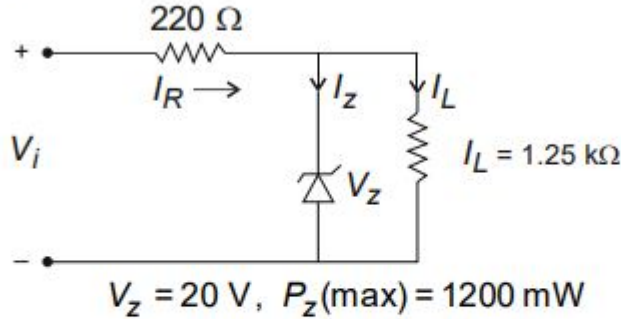
92090659587. 3

92090659588. 4

Question Number : 98 Question Id : 92090615080 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

What will be the range of input voltage  $V_i$  in which the Zener diode shown in the figure below, conducts?



1. 20.52 V to 30.72 V
2. 23.52 V to 36.72 V
3. 26.52 V to 40.72 V
4. 30.52 V to 42.72 V

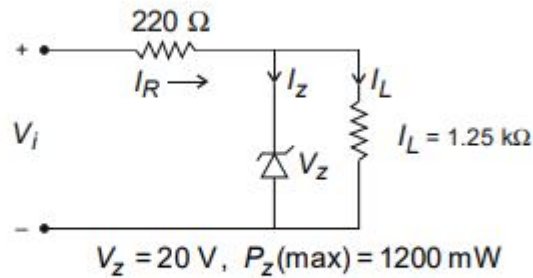
Options :

92090659589. 1  
 92090659590. 2  
 92090659591. 3  
 92090659592. 4

Question Number : 98 Question Id : 92090615080 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

नीचे चित्र में दर्शाए गए जेनर डायोड के चालन हेतु निवेश वोल्टता ( $V_i$ ) की परास क्या होगी ?



- |                        |                        |
|------------------------|------------------------|
| (1) 20.52 V to 30.72 V | (2) 23.52 V to 36.72 V |
| (3) 26.52 V to 40.72 V | (4) 30.52 V to 42.72 V |

Options :

92090659589. 1  
92090659590. 2  
92090659591. 3  
92090659592. 4

**Question Number : 99 Question Id : 92090615081 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The phase space is a

1. two-dimensional space
2. one-dimensional space
3. three-dimensional space
4. six-dimensional space

**Options :**

92090659593. 1  
92090659594. 2  
92090659595. 3  
92090659596. 4

**Question Number : 99 Question Id : 92090615081 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

किसी त्रिविमीय निकाय की प्रावस्था समष्टि है

- |                    |                    |
|--------------------|--------------------|
| (1) द्विविम समष्टि | (2) एक विम समष्टि  |
| (3) त्रिविम समष्टि | (4) षट्‌विम समष्टि |

**Options :**

92090659593. 1  
92090659594. 2  
92090659595. 3  
92090659596. 4

**Question Number : 100 Question Id : 92090615082 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**



Find the output voltage of a non-inverting OP-AMP having  $R_1 = 100 \text{ k}\Omega$ ,  $R_f = 500 \text{ k}\Omega$ , when the input signal is of 2.0 V.

1. 6 V
2. 8 V
3. 12 V
4. 16 V

**Options :**

92090659597. 1  
92090659598. 2  
92090659599. 3  
92090659600. 4

**Question Number : 100 Question Id : 92090615082 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

किसी अनुक्रमित OP-AMP की निर्गत वोल्टता क्या होगी जिसमें  $R_1 = 100 \text{ k}\Omega$  और  $R_f = 500 \text{ k}\Omega$  है और निवेश सिग्नल 2.0 V है?

- |          |          |
|----------|----------|
| (1) 6 V  | (2) 8 V  |
| (3) 12 V | (4) 16 V |

**Options :**

92090659597. 1  
92090659598. 2  
92090659599. 3  
92090659600. 4