Sri Chaitanya IIT Academy.,India.

A.P T.S KARNATAKA TAMILNADU MAHARASTRA DELHI RANCHI

A right Choice for the Real Aspirant

ICON Central Office - Madhapur - Hyderabad

SEC: Sr. Super60 NUCLEUS-BT | **JEE-MAIN** | **Date: 31-05-2025**

Time: 09.00Am to 12.00Pm | **WTM-30** | **Max. Marks: 300**

IMPORTANT INSTRUCTION:

1. Immediately fill in the Admission number on this page of the Test Booklet with **Blue/Black** Ball Point **Pen** only.
2. The candidates should not write their Admission Number anywhere (except in the specified space) on the Test Booklet/ Answer Sheet.
3. The test is of **3 hours** duration.
4. The Test Booklet consists of 90 questions. The maximum marks are **300.**
5. There are **three** parts in the question paper 1,2,3 consisting of **Physics, Chemistry** and **Mathematics** having **30 questions** in each subject and subject having **two sections.**

   (I) Section –I contains 20 **multiple choice** questions with only one correct option.

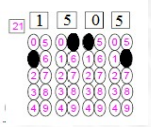
   Marking scheme: +4 for correct answer, 0 if not attempt and -1 in all other cases.

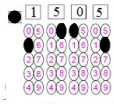
   (II) Section-II contains 10 **Numerical Value Type** questions. Attempt any 5 questions only, if more than 5 questions attempted, First 5 attempted questions will be considered.

   ■ The Answer should be within **0 to 9999.** If the Answer is in **Decimal** then round off to the **nearest Integer** value (Example i,e. If answer is above **10** and less than **10.5** round off is **10** and If answer is from **10.5** and less than **11** round off is **11).**

   To cancel any attempted question bubble on the question number box.

   For example: To cancel attempted question 21. Bubble on 21 as shown below





Question Answered for Marking **Question Cancelled for Marking**

Marking scheme: +4 for correct answer, 0 if **not attempt** and **-1** in all other cases.

6. Use **Blue / Black Point Pen only** for writing particulars / marking responses on the Answer Sheet. **Use of pencil is strictly prohibited.**
7. No candidate is allowed to carry any textual material, printed or written, bits of papers, mobile phone any electron device etc, except the Identity Card inside the examination hall.
8. Rough work is to be done on the space provided for this purpose in the Test Booklet only.
9. On completion of the test, the candidate must hand over the Answer Sheet to the invigilator on duty in the Hall. **However, the candidate are allowed to take away this Test Booklet with them.**
10. **Do not fold of make any stray marks on the Answer Sheet**

Name of the Candidate (in Capital): _____

Admission Number: | | | | | | | | | |

Candidate's Signature:_____ **Invigilator's Signature:** _____

31-05-2025_Sr.Super60_NUCLEUS-BT_Jee-Main-WTM-30_Test Syllabus

MATHEMATICS :Permutations & Combinations: Fundamental Principles of counting, Fundamental Principles of counting, Linear permutation, Circular permutation, Definition of combinations and problems based on nCr only

PHYSICS : WAVE OPTICS: Theories on nature of light, Huygen's principle: Wavefronts and rays, Reflection of spherical wavefront at plane surface, Refraction of plane wavefront at plane surface, Young's double-slit experiment: Qualitative treatment, Theory of interference fringes: Analytical treatment of Young's double-slit experiment, Displacement of fringes of introducing a thin transparent sheet in the path of one of the interfering beams, Intensity distribution in interference pattern, YDSE with white light, YDSE with source away from line of symmetry, Modified YDSE (Eg: Fresnel mirror experiment, Fresnel biprism, Billetlens, Lloyd's mirror)

CHEMISTRY : ETHERS: Preparation by Williamson's synthesis, from alkenes, from alcohols and phenols, C-O bond cleavage reactions, Electrophilic substitution reactions of anisole, ring opening reactions of oxiranes, PHENOLS: Prepartion, properties & Reactions, Physical properties; Preparation, Electrophilic substitution reactions of phenol (halogenation, nitration, sulphonation); Reimer-Tiemann reaction, Kolbe reaction;, Esterification; Etherification; Aspirin synthesis; Oxidation and reduction reactions of phenol, Bakelite formation, phenolphthalein formation, Azo-dye formation, Tests for phenols,
ALDEHYDES & KETONES: Preparation of: aldehydes and ketones from acid chlorides and nitriles; aldehydes from esters; benzaldehyde from toluene and benzene, Distillation of calcium salts of carboxylic acids, oxo process, Wacker's process, Physical properties, Nucleophilic addition reaction with RMgX, NaHSO3, HCN, water, alcohol

MATHEMATICS **Max Marks: 100**

SECTION-I
(SINGLE CORRECT ANSWER TYPE)

This section contains **20 Multiple Choice Questions.** Each question has 4 options (1), (2), (3) and (4) for its answer, out of which ONLY ONE option can be correct.

Marking scheme: +4 for correct answer, 0 if not attempted and –1 in all other cases.

1. Let P be the set of seven digit numbers with sum of their digits equal to 11. If the numbers in P are formed by using the digits 1,2, and 3 only, then the number of elements in the set P is :

1) 173 **2)** 164 **3)** 158 **4)**161

2. The number of 6-letter words, with or without meaning, that can be formed using the letters of the word MATHS such that any letter that appears in the word must appear at least twice, is _____.

1) 1405 **2)** 1400 **3)**1395 **4)** 1205

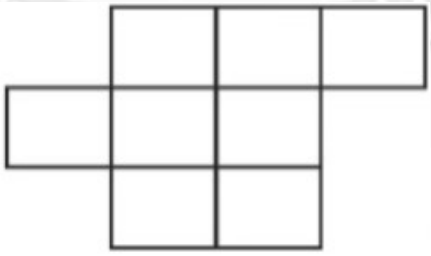
3. If all the words with or without meaning made using all the letters of the word 'KANPUR" are arranged as in a dictionary, then the word at 440th position in this arrangement, is :

1) PRNAUK **2)** PRKANU **3)** PRKAUN **4)** PRNAKU

4. The number of different 5 digit numbers greater than 50000 that can be formed using the digits 0, 1,2,3,4,5,6,7 such that the sum of their first and last digits should not be more than 8, is

1) 4608 **2)** 5720 **3)** 5719 **4)** 4607

5. The number of ways, in which the letters A,B,C,D,E can be placed in the 8 boxes of the figure below so that no row remains empty and at most one letter can be placed in a box,(without repetition of the letters) is:



1) 960 **2)** 5760 **3)** 840 **4)** 5880

6. From a group of 7 batsmen and 6 bowlers, 10 player are to be chosen for a team, which should include atleast 4 batsmen and atleast 4 bowlers. One batsmen and one bowler who are captain and vice-captain respectively of the team should be included. Then the total number of ways such a selection can be made, is

1)135 **2)** 165 **3)** 145 **4)** 155

7. The number of ways of forming an arrangement of 5 letters from the letters of the word "IITJEE" is

1) 60 **2)** 96 **3)** 120 **4)** 180

8. The number of times the digit 3 will be written when listing the integers from 1 to 1000, is

1) 269 **2)** 300 **3)** 271 **4)** 302

9. The number of three digit numbers with three distinct digits such that one of the digits is the arithmetic mean of the other two is

1) 120 **2)** 180 **3)** 112 **4)** 104

10. Let X be the number of linear permutations of all the letters of the word *SBISMART* in which the two S 's are always together, Y be the number of linear permutations of all the letters of the word *SBISMART* in which the two S 's are never together, then $\frac{Y}{X}$ is

1)120 **2)** 5 **3)** 3 **4)** 7

11. Let P be the number of ways in which 5 Boys and 5 Girls form a circle such that Boys and Girls are alternate Q be the number of ways in which 5 Boys and 5 Girls form a line such that Boys and Girls are alternate. Then the value of $\frac{Q}{P}$ is

1) 10 **2)**5 **3)** 1 **4)** 2

12. Let S be the set of all 2×2 matrices formed by using the elements of the set $\{0,1,-1\}$.Then the number of singular matrices which belong to the set S is

1) 81 **2)** 33 **3)** 44 **4)** 27

13. The total number of five digit numbers of different digits in which the digit in the middle is the largest is,

1) $\sum_{n=4}^{9} {}^{n}P_4$ **2)** $33(3!)$ **3)** $30(3!)$ **4)** $\sum_{n=3}^{8} n.{}^{n}P_3$

14. If K is the number of polynomials of the x^3+ax^2+bx+c which are divisible by (x^2+1) $(where\, a,b,c\in\{1,2,....20\})$ then the value of K is,

1) 10 **2)** 30 **3)** 20 **4)**50

15. **Statement-1:** If different words are formed using all the letters from the word **"INDIANIDOL"** in which number of words containing **"INDIA"** but not **"INDIAN"** is 600

Statement-2: If different words are formed using all the letters from the word **"INDIANIDOL"** in which number of words which contains **"INDIAN"** but not **"IDOL"** is 118

1) Statement-1 is false, Statement-2 is false

2) Statement-1 is true, Statement-2 is true

3) Statement-1 is true, Statement-2 is false

4) Statement-1 is false, Statement-2 is true

16. A host invites 20 person for a party. The number of ways they can be seated at a circular table, such that two particular person be seated on either side of the host is

1) $2\times18!$ **2)** $18!$ **3)** $20!$ **4)** $2\times20!$

17. sum of the digits in the unit's place of all 4 digit numbers formed with the help of 3,4,5,6 taken all at a time (without repetition) is 'K' then K=

1) 108 **2)** 100 **3)** 120 **4)** 24

18. Six persons A,B,C,D,E and F are to be seated around circular table. The number of ways this can be done if A must have either B or C on his right and B must have either C or D on his right is

1) 18 **2)** 6 **3)** 120 **4)** 24

19. There are 720 permutations of the digits 1,2,3,4,5,6. Suppose these permutations are arranged from smallest to largest numerical values, beginning from 123456 and ending with 654321. Then the digit in units place of number at 267th position,

is

1) 6 **2)** 5 **3)** 4 **4)** 3

20. Match the following list-I and list-II

	List-I		List-II
a)	Four dice (six faced fair dice) are rolled. The number of possible outcomes in which at least one dice shows 2 is	p)	210
b)	Let A be the set of 4-digit number $a_1 a_2 a_3 a_4$, where $a_1 > a_2 > a_3 > a_4$ .Then n(A) is equal to	q)	750
c)	The total number of three-digit numbers, the sum of whose digits is even, is equal to	r)	671
d)	The number of four-digit numbers that can be formed from the digits 0,1,2,3,4,5,6,7 so that each number contains digit 1 is	s)	450

1) a-r,b-p,c-s,d-q **2)** a-p,b-q,c-s,d-r

3)a-s,b-p,c-q,d-r **4)** a-r,b-p,c-q,d-s

SECTION-II
(NUMERICAL VALUE TYPE)

This section contains **5 Numerical Value Type Questions.** The Answer should be within **0 to 9999.** If the Answer is in **Decimal** then round off to the **Nearest Integer** value (Example i,e. If answer is above **10** and less than **10.5** round off is **10** and If answer is from **10.5** and less than **11** round off is **11**).

Marking scheme: +4 for correct answer, 0 if not attempt and -1 in all other cases.

21. A class has three teachers, Mr.P, Mr. Q and Mr.R and six students A, B, C, D, E, F. The number of ways in which they can be seated in a line of 9 chairs, if between any two teachers there are exactly two students is $k \times 6!$,then k =

22. A women forgets her 4 digit numeric locker code (Each code can be a numeric digit $\in \{0,1,2,3,4,5,6,7,8,9\}$) but she remembers that in the code all the digits are different, the greatest digit is 7 and the sum of the first two digits is equal to the sum of the last two digits then the maximum number of trials required to open the locker is

23. Five digit numbers are formed using the digits 1,2,3,5,7 with or without repetition of digits and are written in descending order with serial numbers(for examples the number 77777 has serial number 1),then the serial number of 35337 is

24. The number of points having position vector $a\hat{i}+b\hat{j}+c\hat{k}$ where $a,b,c \in \{1,2,3,4,5\}$ such that $2^a+3^b+5^c$ is divisible by 4 is,

25. The number of positive integers of 4 digit formed using digits 2,3,7,9 (with or without repetition of digits) which are divisible by 3 is,

PHYSICS **Max Marks: 100**

SECTION-I
(SINGLE CORRECT ANSWER TYPE)

This section contains **20 Multiple Choice Questions.** Each question has 4 options (1), (2), (3) and (4) for its answer, out of which ONLY ONE option can be correct.

Marking scheme: +4 for correct answer, 0 if not attempted and –1 in all other cases.

26. When interference of light takes place:

1) Energy is created in the region of maximum intensity

2) Energy is destroyed in the region of maximum intensity

3) Conservation of energy holds good and energy is redistributed

4) Consergation of energy does not hold good

27. Light of wavelength λ in air enters a medium of refractive index μ. Two points in this medium, lying along the path of this light, are at a distance x a part. The phase difference between these points is:

1) $\mu\frac{2\pi}{\lambda}x$ **2)** $\frac{1}{\mu}.\frac{2\pi}{\lambda}x$ **3)** $(\mu-1)\frac{2\pi}{\lambda}x$ **4)** $\frac{1}{(\mu-1)},\frac{2\pi}{\lambda}x$

28. Upon reflection from a surface, the phase angle of a light wave shifts by π if:

1) the reflecting surface is opaque

2) the medium containing the wave has a lower refractive index than the medium behind the reflecting surface

3) the medium containing the wave has a higher refractive index than the medium behind the reflecting surface

4) in all cases

29. Light travels from a point source and falls on a screen. Now a glass slab is introduced Between the source and the screen such that its two faces are parallel to the screen. The slab does not absorb or reflect any light. The size of the slab is sufficiently large to ensure that all the light that falls on the screen passes through the slab. Then, due to the introduction of the slab, the incident intensity of light at any point on the screen:

1) stays the same

2) increases

3) decreases

4) increases for some points and decreases for others

30. In a two slit experiment with monochromatic light, fringes are obtained on a screen placed at some distance from the slits. If the screen is moved by a distance of $10\times10^{-2}m$ towards the slits, the change in the fringe width is $6\times10^{-5}m$. If the separation between the slits is $10^{-3}m$, the wavelength of light used is:

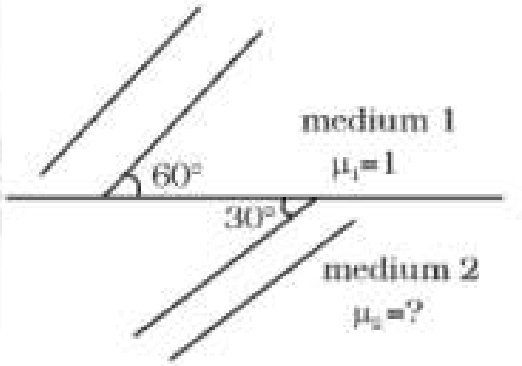
1) $5\times10^{-7}m$ **2)** $6\times10^{-7}m$ **3** $7\times10^{-7}m$ **4)** $6\times10^{-6}m$

31. In Young's double –slit experiment, the separation between the slits is d, distance between the slit and screen is $D(D>>d)$. In the interference pattern, there is a maxima exactly in front of each slit. Then the possible wavelength (s) used in the experiment are:

1) $\frac{x}{y}$ **2)** $\frac{d^2}{D},\frac{d^2}{3D},\frac{d^2}{5D}$

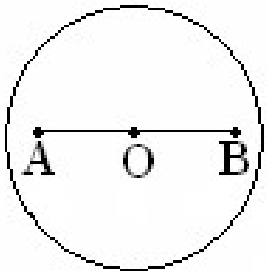
3) $\frac{d^2}{2D},\frac{d^2}{4D},\frac{d^2}{6D}$ **4)** None of these

32. Incident and refracted parallel plane wave fronts in medium (1) and (2) respectively are shown in figure. Medium (1) is air. Find the refractive index of medium (2).



1) $\sqrt{2}$ **2)** $\sqrt{3}$ **3)** 2 **4)** $\sqrt{3}/\sqrt{2}$

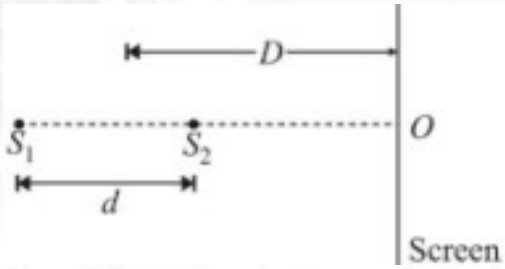
33. Two coherent radio point sources separated by 4.0m are placed at points A and B along a straight line as shown. Both are emitting waves in phase of 1.0 m wave length. A detector moves in a large circular path around the two sources in a plane containing them.



Point A and B lie on the diameter of the circle and they are at equidistant from the center of the circle O as shown. Find the number of maxima counted by the detector in one full circle.

1) 9 **2)** 10 **3)** 15 **4)** 16

34. Two points monochromatic and coherent sources of light of wavelength λ each are Placed as shown in figure. The initial phase difference between the sources is zero O. $(D >> d)$. Mark the Correct statement (s).



A) If $d = \frac{7\lambda}{2}, O$ will be a minima

B) If $d = \lambda,$ only one maxima can be observed on the screen

C) If $d = 4.8\lambda;$ then total 10 minima would be there on the screen

D) If $d = \frac{5\lambda}{2}$, the intensity at O would be minimum.

1) Only A &B are correct **2)** Only C&D are correct

3) A,B,C,D are correct **4)** None is correct

35. Statement-1: In standard YDSE set up with visible light, the position on screen where phase difference is zero appears bright.

Statement-2: In YDSE set up magnitude of electromagnetic field at central bright fringe is not varying with time.

1) Statement-1 is true, Statement-2 is true and Statement-2 is correct explanation for Statement-1.

2) Statement-1 is true, Statement-2 is true and Statement-2 is NOT the correct explanation for Statement-1.

3) Statement-1 is true, Statement-2 is false.

4) Statement-1 is false, Statement-2 is true.

36. Assertion: In YDSE, the spacing between any two successive points having intensity half of the maximum intensity is same.

Reason: The intensity on the screen in YDSE varies uniformly with distance from central maximum.

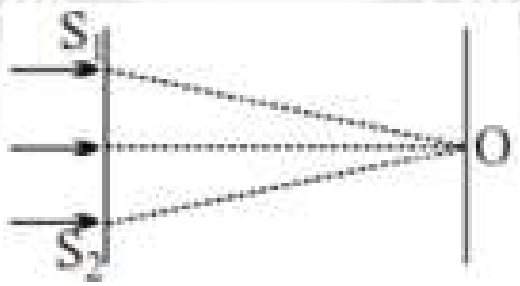
1) Assertion is true, Reason is true and Reason is correct explanation for Assertion.

2) Assertion is true, Reason is true and Reason is NOT the correct explanation for Assertion.

3) Assertion is true, Reason is false.

4) Assertion is false, Reason is true.

37. **Statement-1:** In YDSE, as shown in figure, central bright fringes is formed at O. If a liquid is filled between plane of slits and screen, the central bright fringe is shifted in upward direction.



Statement-2: If the path difference at O increases, y-coordinate of central bright fringe will change.

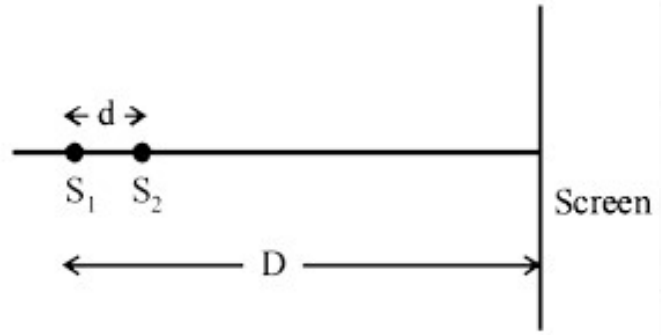
1) Statement-1 is true, Statement-2 is true and Statement-2 is correct explanation for Statement-1.

2) Statement-1 is true, Statement-2 is true and Statement-2 is NOT the correct explanation for Statement-1.

3) Statement-1 is true, Statement-2 is false.

4) Statement-1 is false, Statement-2 is true.

38. Two coherent point sources S_1 and S_2 are separated by a small distance 'd' as shown. The fringes obtained on the screen will be:



1) Points **2)** straight lines 3) semi-circles **4)** concentric circles

39. In a Young's double slit experiment, slits are separated by 0.5 mm, and the screen is placed 150 cm away. A beam of light consisting of two wavelengths 650 nm and 520 nm is used to obtain interference pattern on the screen. The least distance from the central maximum to a point where the bright fringes due to both the wavelengths coincide is

1) 15.6 mm **2)** 1.56 mm **3)** 7.8 mm **4)** 9.75 mm

40. Spherical wave fronts, emanating from a point source, strike a plane reflecting surface. What will happen to these wave front, immediately after reflection ?

1) They will remain spherical with the same curvature, both in magnitude and sign

2) They will become plane wave fronts

3) They will remain spherical, with the same curvature, but sign of curvature reversed

4) They will remain spherical, but with different curvature, both in magnitude and sign.

41. A beam of light of wavelength 600 nm from a distant source fall on a YDSE setup Having slit separation 1.00 mm and resulting interference pattern is observed on a screen 2m away from the slits. The distance between first dark fringe and 2nd bright fringe is

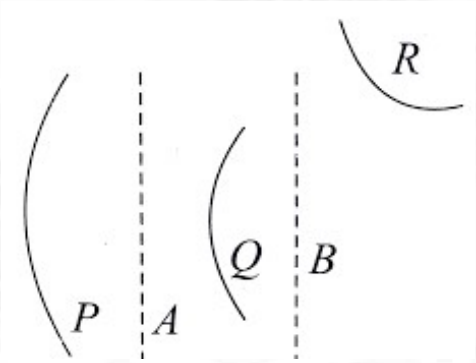
1) 2mm **2)** 3 mm **3)** 4 mm **4)** None

42. How is the interference pattern is affected if the Young's experiment is performed in still water than in air?

1) Fewer fringes will be visible **2)** Fringes will be broader

3) Fringes will be narrower **4)** No fringes will be observed

43. Figure shows a wave front P passing through two systems A and B, and emerging as Q and then as R. The system A and B could, respectively, be:



1) a prism and a convergent lens **2)** a convergent lens and a prism

3) a divergent lens and a prism **4)** a convergent lens and divergent lens

44. Two coherent sources of light emit waves with wavelength with constant phase difference of 180^0. The intensity due to each at a point on a screen is I_0. At a point on the screen where the path difference between two waves is $\frac{3\lambda}{2}$, the total intensity will be:

1) $2I_0$ **2)** $4I_0$ **3)** $6I_0$ **4)** $3I_0$

45. In a Young's experiment the fringes are displaced by a distance 'x' when a glass plate of refractive index 1.5 is introduced in the path of one of the beam. When this plate is replaced by another plate of same thickness, then the displacement of fringes is $\left(\frac{3}{2}x\right)$.

The refractive index of second plate is

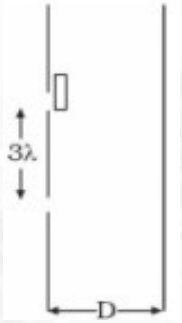
1) 1.75 **2)** 1.50 **3)** 1.25 **4)** 1.00

SECTION-II
(NUMERICAL VALUE TYPE)

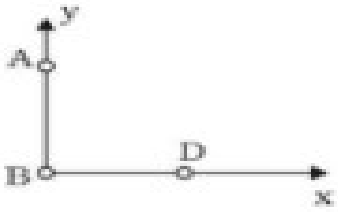
This section contains **5 Numerical Value Type Questions.** The Answer should be within **0 to 9999.** If the Answer is in **Decimal** then round off to the **Nearest Integer** value (Example i,e. If answer is above **10** and less than **10.5** round off is **10** and If answer is from **10.5** and less than **11** round off is **11).**

Marking scheme: +4 for correct answer, 0 if not attempt and -1 in all other cases.

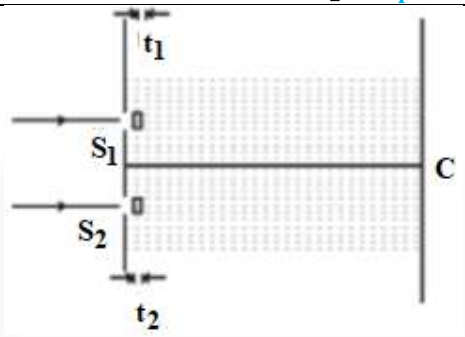
46. In the diagram shown, the separation between the slit is equal to 3λ, where λ is the Wavelength of the light incident on the plane of the slits. A thin film of thickness $\frac{\lambda}{100}$ and refractive index 2 has been placed in the front of the upper slit. The distance of the central maxima on the screen from O is $\frac{D}{N\times 60}$ find N. (Consider $D >> \lambda$)



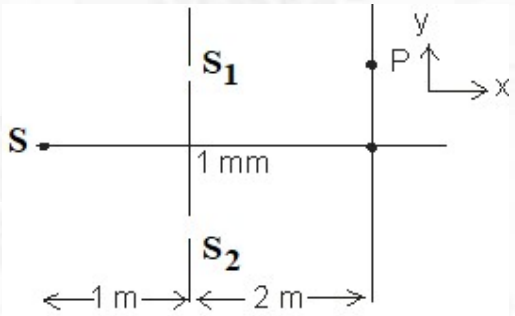
47. An interference is observed due to two coherent sources 'A' & 'B' having zero phase difference separated by a distance 4 λ along the $y-axis$ where λ is the wavelength of the source, (see figure). A detector D is moved on the positive x-axis. The number of points on the x-axis excluding The points $x=0$ & $x=\infty$ at which maximum will be observed is .



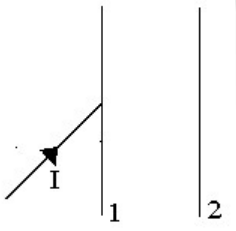
48. A screen is at a distance $D=80cm$ from a diaphragm having two narrow slits S_1 and S_2 Which are $d=2mm$ apart. Slit S_1 is covered by a transparent sheet of thickness $t_1=2.5\mu m$ and S_2 by another sheet of thickness $t_2=1.25\mu m$ as shown in figure. Both sheets are made of same material having refractive index $\mu=1.40$ and water is filled in space between diaphragm and screen. A monochromatic light beam of wavelength $\lambda=5000A$ is incident normally on the diaphragm. Assuming Intensity of beam to be uniform, calculate ratio of intensity at central point on screen to individual identical Beams through slits. $(\mu_\omega=4/3)$.



49. In a Young's double slit experiment set up, source S of wavelength 500 nm illuminates two slits S_1 and S_2 which act as two coherent sources. The source S oscillates about its own position according to the equation $y = 0.5\sin\pi t$ where y is in mm and t in seconds. The minimum value of time t for which the intensity at point P on the screen exactly in front of the upper slit becomes minimum is



50. A narrow monochromatic beam of light of intensity I is incident on a glass plate as shown in figure. Another identical glass plate is kept parallel to it. Each glass plate reflects 25% of the light incident on it and transmits the remaining. Then the ratio of the maximum to minimum intensities in the interference pattern formed by the two beams obtained after one reflection at each plate is $\frac{x}{y}$.(x and y are the least values) . Find x+y



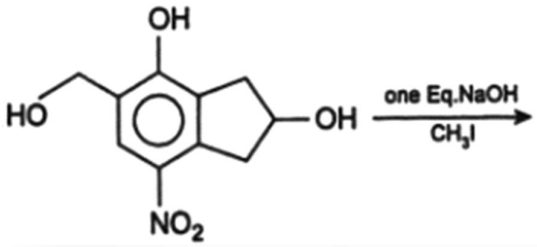
CHEMISTRY **Max Marks: 100**

SECTION-I
(SINGLE CORRECT ANSWER TYPE)

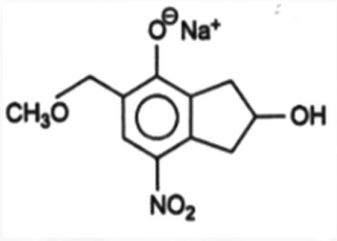
This section contains **20 Multiple Choice Questions**. Each question has 4 options (1), (2), (3) and (4) for its answer, out of which ONLY ONE option can be correct.

Marking scheme: +4 for correct answer, 0 if not attempted and –1 in all other cases.

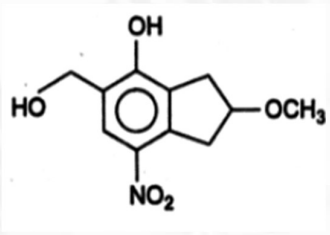
51.



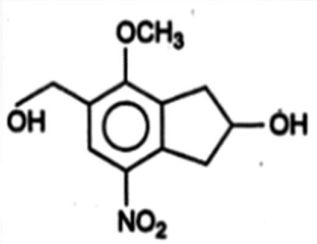
1)



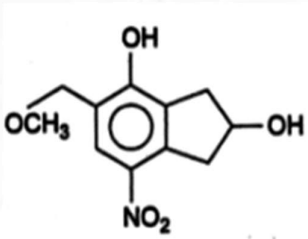
2)



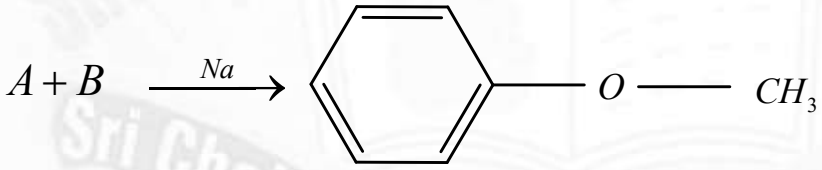
3)



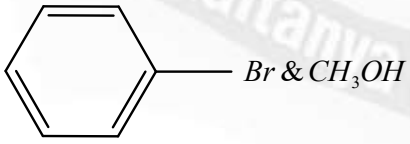
4)



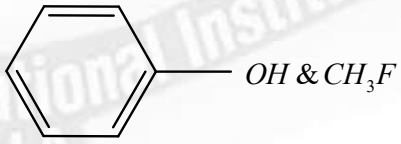
52.



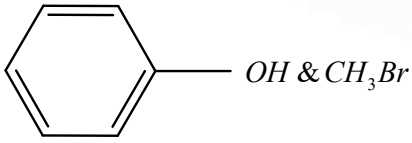
1)



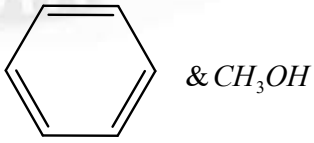
2)



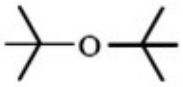
3)

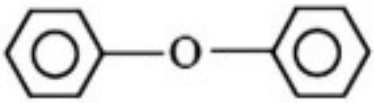


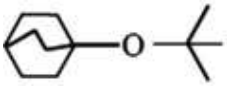
4)



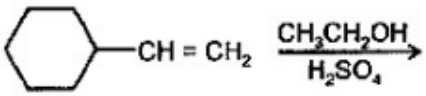
53. Which one of the following ethers can be prepared by Williamson's Ether synthesis.

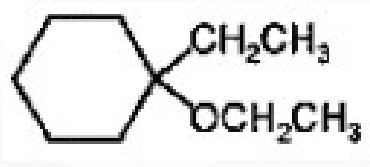
1) 

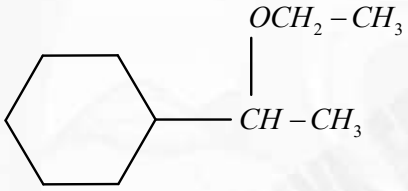
2) 

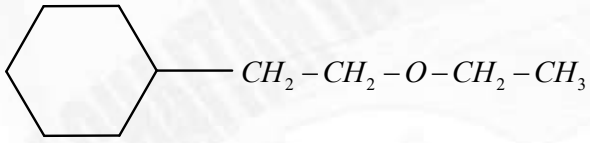
3) 

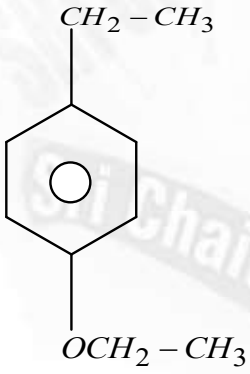
4) 

54.  major product

1) 

2) 

3) 

4) 

55. Which of the following reactions is a good way prepare methyl tert-butyl ether?

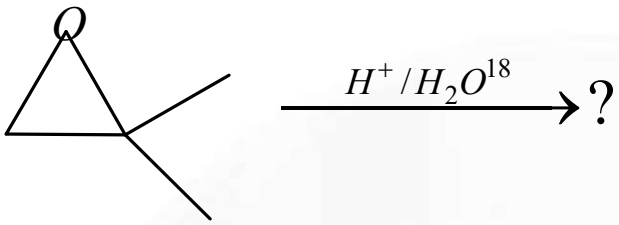
1) $CH_3O^-Na^+ + (CH_3)_3CBr \rightarrow$

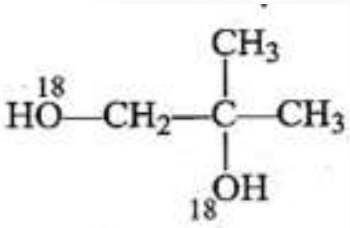
2) $(CH_3)_3CO^-K^+ + CH_3I \rightarrow$

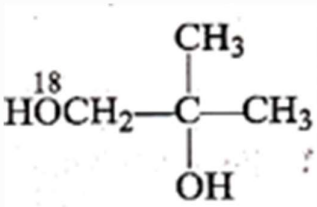
3) $(CH_3)_3COH + CH_3OH \xrightarrow{NaOH}$

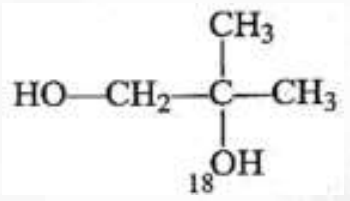
4) $CH_3MgBr + (CH_3)_3COCl \rightarrow$

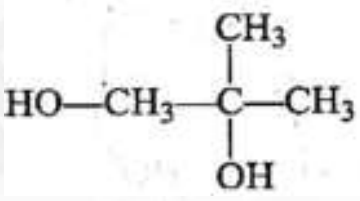
56. What is the major product of the following reaction?

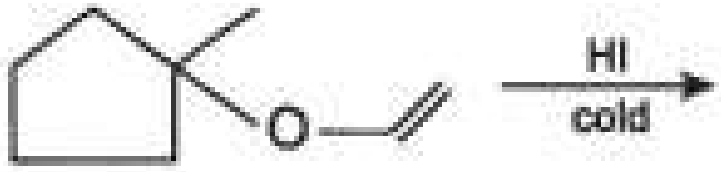


1) 

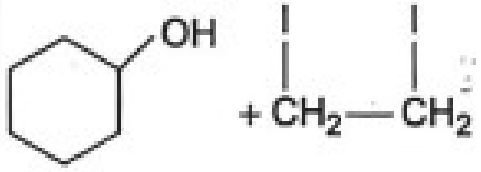
2) 

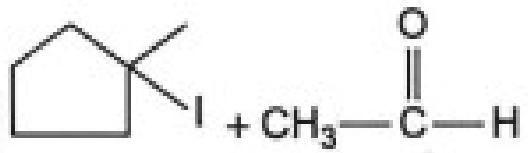
3) 

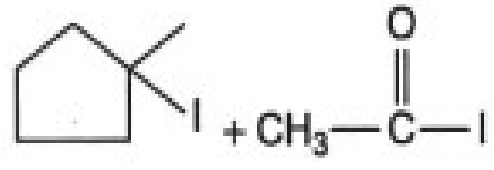
4) 

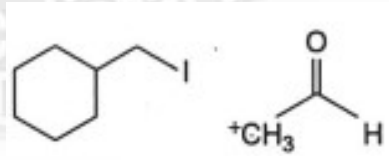
57. 

The products of the above reaction are

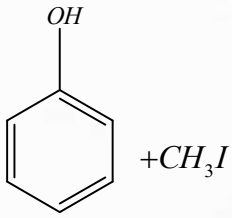
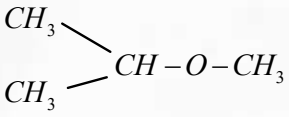
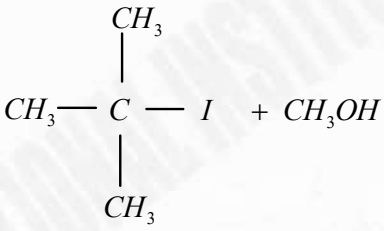
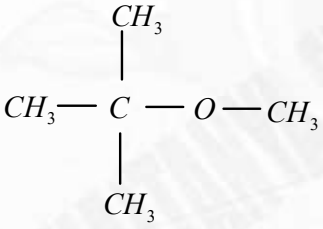
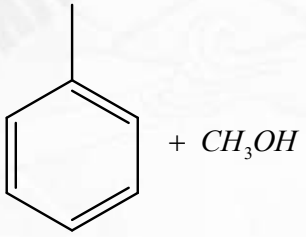
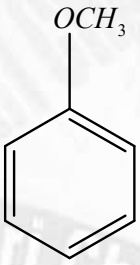
1) 

2) 

3) 

4) 

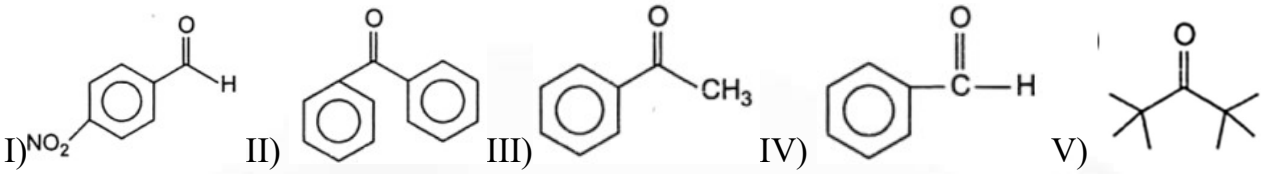
58. Match the starting materials given in Column I with the products formed by these (Column II) in the reaction with HI

	COLUMN-I		**COLUMN-II**
a.	CH_3-O-CH_3	p.	
b.		q.	
c.		r.	
d.		s.	$CH_3-OH+CH_3-I$
		t.	

1) $a \to r;\ b \to s;c \to q;\ d \to p$ **2)** $a \to r;\ b \to s;c \to p;\ d \to q$

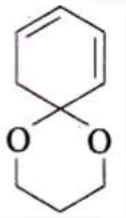
3) $a \to s;\ b \to t;c \to q;\ d \to p$ **4)** $a \to s;\ b \to t;c \to p;\ d \to q$

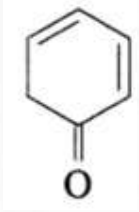
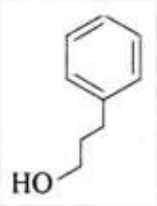
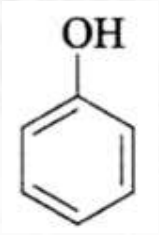
59. The correct order of reactivity of the compounds towards nucleophile addition is



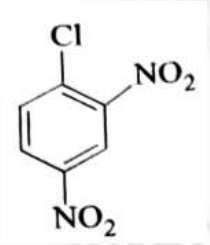
1) I>II>IV>III>V **2)** IV>I>II>III>V

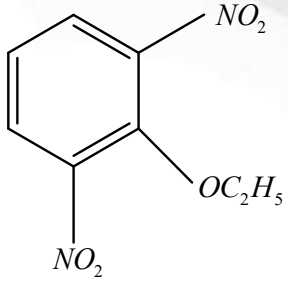
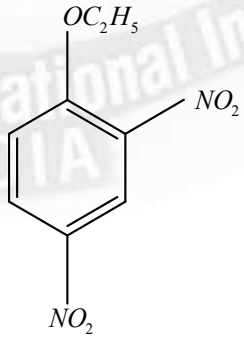
3) II>I>IV>III>V **4)** I>IV>III>II>V

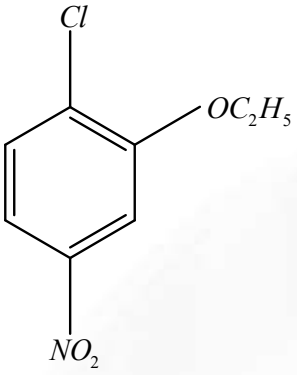
60.  $\xrightarrow{H_3O^+} P(Major), P$ is

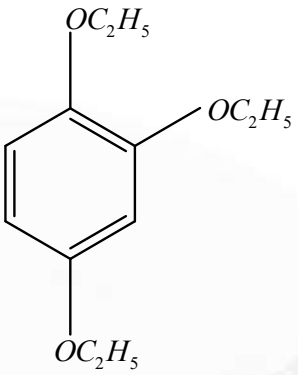
1)  **2)**  **3)**  **4)** 

61. Which of the following is the major product from this reaction?

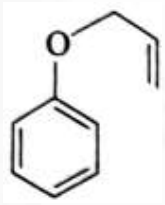
 $\xrightarrow[C_2H_5OH]{C_2H_5ONa}$

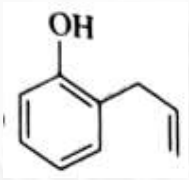
1)  **2)** 

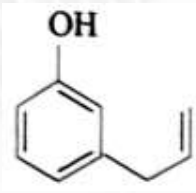
3) 

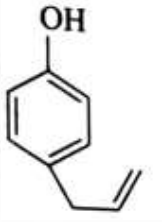
4) 

62. When phenol is refluxed with allyl bromide in acetone solution in the presence of Anhydrous potassium carbonate a product may be isolated which on heating to $200^{\circ}C$ is converted mainly to

1) 

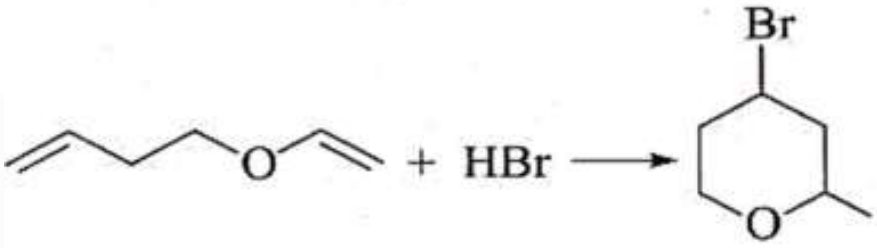
2) 

3) 

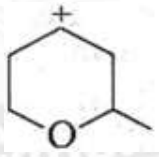
4) 

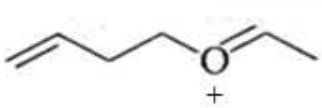
63. Consider the following reaction

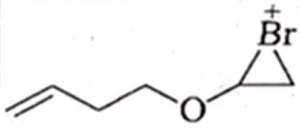
The reactive intermediate not involved in the above reaction is



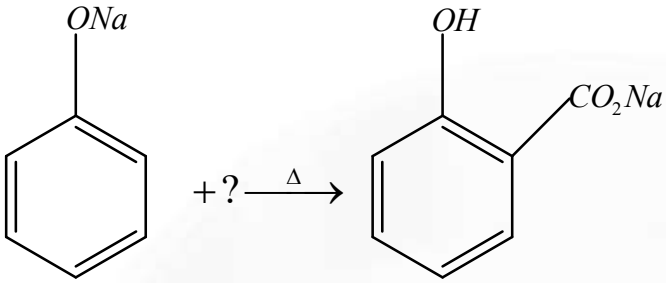
1) 

2) 

3) 

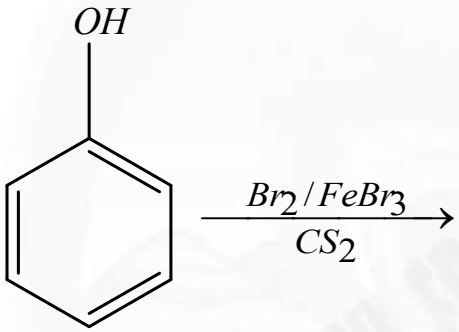
4) 

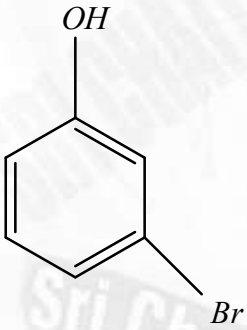
64. Which one is the missing reagent of Kolbe Schmidt reaction?



1) HCO_2Et **2)** $(EtO)_2C=O$ **3)** CO_2 **4)** HCO_2Na

65. Which of the following is the major product of the reaction below?



1)


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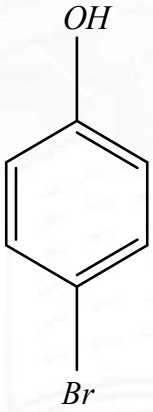

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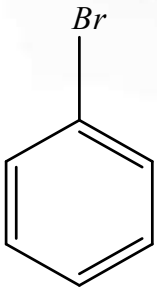

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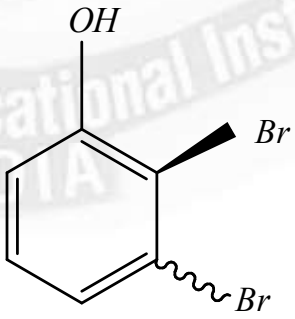
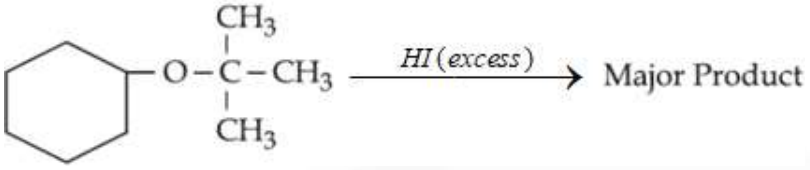
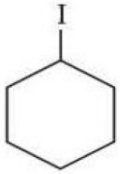
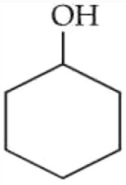
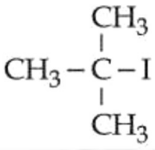
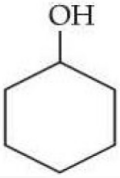


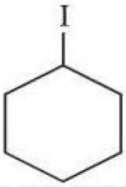
66.



1)  and $(CH_3)_3COH$

2)  and 

3)  and $(CH_3)_3COH$

4)  and $(CH_3)_3CI$

67. Given below are two statements: One is labeled as Assertion A and the other is labeled as Reason R:

Assertion A: pK_a value of phenol is less than ethanol

ReasonR: Ethanol is stronger acid than phenol.

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

1) Both A and R are true and R is the correct explanation of A

2) A is false but R is true.

3) A is true but R is false

4) Both A and R are true but R is NOT the correct explanation of A.

68. Match List-I with List-II

	List-I Reactants		**List-II Product**
A)	Phenol, Zn/Δ	(I)	Salicylaldehyde
B)	Phenol, $CHCl_3, NaOH, HCl$	(II)	Salicylic acid
C)	Phenol, $CO_2, NaOH, HCl$	(III)	Benzene
D)	Phenol. Conc. HNO_3	(IV)	Picric acid

Choose the correct answer from the options given below:

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

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

69. Final product of following reaction contain $CH_3-C\equiv C-CH_2-\underset{\underset{O}{\|}}{C}-Cl \xrightarrow[BaSO_4]{H_2-Pd}$

1) Only aldehyde groups **2)** Triple bond & alcohol

3) Double bond & alcohol **4)** Double bond & aldehyde

70. When 1-butyne is treated with aqueous H_2SO_4 in presence of $HgSO_4$, the major product is

1) Butanal **2)** Butanone **3)** Butanol **4)** Buten-2-ol

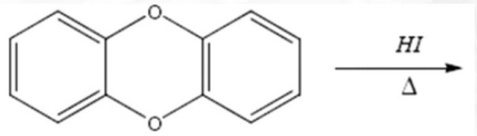
SECTION-II
(NUMERICAL VALUE TYPE)

This section contains **5 Numerical Value Type Questions.** The Answer should be within **0 to 9999.** If the Answer is in **Decimal** then round off to the **Nearest Integer** value (Example i,e. If answer is above **10** and less than **10.5** round off is **10** and If answer is from **10.5** and less than **11** round off is **11**).

Marking scheme: +4 for correct answer, 0 if not attempt and -1 in all other cases.

71. Cyclohexa-1,3 diene $\xrightarrow[2)Zn/H_2O]{1)O_3}$ products

The number of aldehyde groups is the product mixture

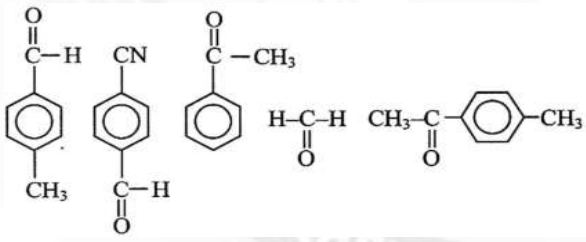


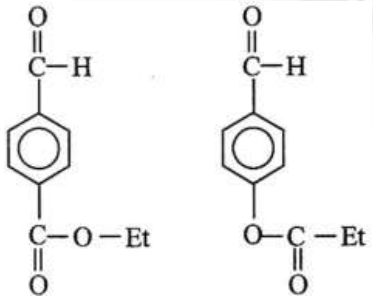
(A)

72. Number of moles of HI consumed per mole of (A) is x.

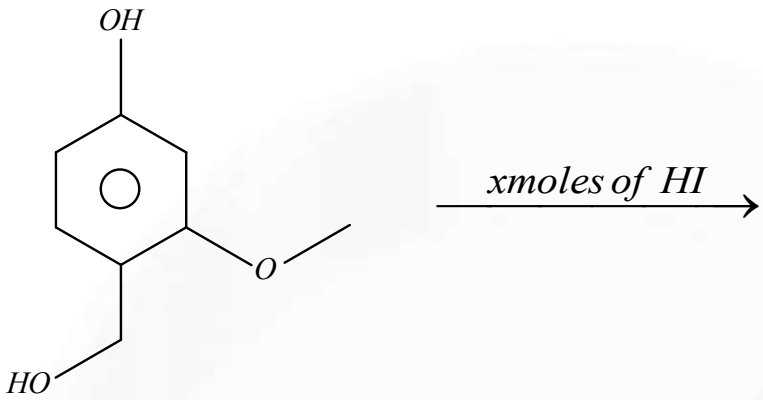
Identify the value of x

73. How many of the following gives faster cyanohydrins than p-chloro benzaldehyde

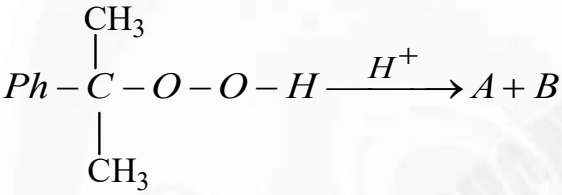




74.



The value x is



75. A given halo form test.

What is the molecular weight of B

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