CAREER ENDEAVOUR

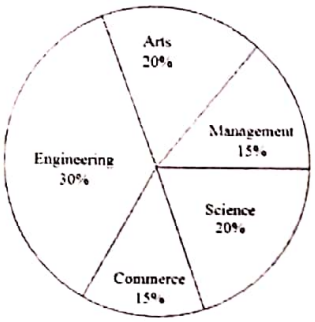
Graduate Aptitude Test in Engineering 2020 01st Feb S2

Participant ID	
Participant Name	CAREER ENDEAVOUR
Test Center Name	
Test Date	01/02/2020
Test Time	2:30 PM - 5:30 PM
Subject	CY CHEMISTRY

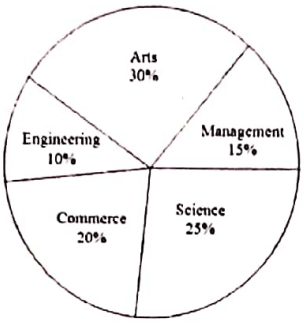
General Aptitude

Q.1 The two pie-charts given below show the data of total students and only girls registered in different streams in a university. If the total number of students registered in the university is 5000, and the total number of the registered girls is 1500; then, the ratio of boys enrolled in Arts to the girls enrolled in Management is _____.

Percentage of students enrolled in different streams in a University



Percentage of girls enrolled in different streams

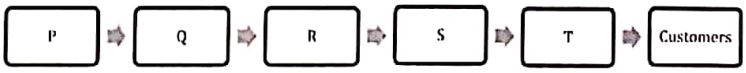


Options 1. 2 : 1
2. 11 : 9
3. 9 : 22
4. 22 : 9

OPTION - 4

Question ID : **2672363925**
Status : **Answered**
Chosen Option :

Q.2 There are five levels {P, Q, R, S, T} in a linear supply chain before a product reaches customers, as shown in the figure.



At each of the five levels, the price of the product is increased by 25%. If the product is produced at level P at the cost of Rs. 120 per unit, what is the price paid (in rupees) by the customers?

Options 1. 292.96
2. 187.50
3. 366.21
4. 234.38

OPTION - 3

Question ID : **2672363920**
Status : **Answered**
Chosen Option :

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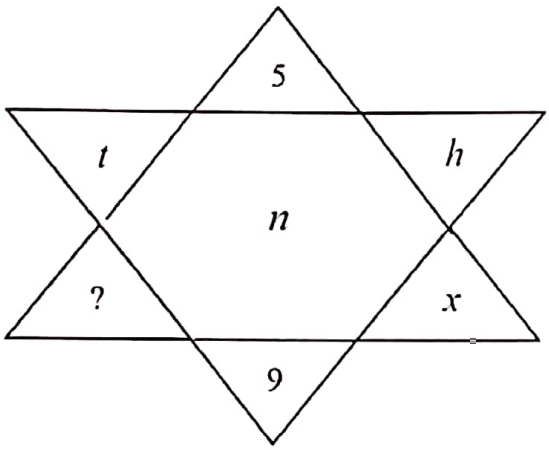
Q.3 It was estimated that 52 men can complete a strip in a newly constructed highway connecting cities P and Q in 10 days. Due to an emergency, 12 men were sent to another project. How many number of days, more than the original estimate, will be required to complete the strip?

Options 1. 5 days
2. 10 days
3. 13 days
4. 3 days

OPTION - 4

Question ID : 2672363923
Status : Answered
Chosen Option :

Q.4 Find the missing element in the following figure.



Options 1. y
2. e
3. w
4. d

OPTION - 4

Question ID : 2672363922
Status : Not Attempted and Marked For Review
Chosen Option :

Q.5 Select the word that fits the analogy:

White: Whitening : : Light: _____

Options 1. Lightning
2. Lighting
3. Lightening
4. Enlightening

OPTION - 2

Question ID : 2672363918
Status : Answered
Chosen Option :

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Q.6 In one of the greatest innings ever seen in 142 years of Test history, Ben Stokes upped the tempo in a five-and-a-half hour long stay of 219 balls including 11 fours and 8 sixes that saw him finish on a 135 not out as England squared the five-match series.

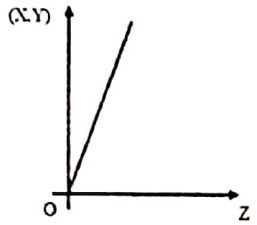
Based on their connotations in the given passage, which one of the following meanings DOES NOT match?

Options 1. saw = resulted in
2. squared = lost
3. upped = increased
4. tempo = enthusiasm

OPTION: 2

Question ID : **2672363919**
Status : **Answered**
Chosen Option .

Q.7 An engineer measures THREE quantities X, Y and Z in an experiment. She finds that they follow a relationship that is represented in the figure below: (the product of X and Y linearly varies with Z)



Then, which of the following statements is FALSE?

Options 1. For fixed Y; X is proportional to Z
2. For fixed Z; X is proportional to Y
3. For fixed X; Z is proportional to Y
4. XY/Z is constant

OPTION: 2

Question ID : **2672363924**
Status : **Answered**
Chosen Option :

Q.8 The recent measures to improve the output would____the level of production to our satisfaction.

Options 1. increase
2. speed
3. decrease
4. equalise

OPTION: 1

Question ID : **2672363917**
Status : **Answered**
Chosen Option :

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Q.9 Climate change and resilience deal with two aspects – reduction of sources of non-renewable energy resources and reducing vulnerability of climate change aspects. The terms 'mitigation' and 'adaptation' are used to refer to these aspects, respectively.

Which of the following assertions is best supported by the above information?

Options 1. Adaptation deals with actions taken to combat green-house gas emissions.
2. Mitigation deals with actions taken to reduce the use of fossil fuels.
3. Adaptation deals with causes of climate change.
4. Mitigation deals with consequences of climate change.

OPTION- 2

Question ID : 2672363921
Status : Not Answered
Chosen Option :

Q.10 While I agree_____his proposal this time, I do not often agree_____him.

Options 1. to, with
2. to, to
3. with, to
4. with, with

OPTION:- 1

Question ID : 2672363916
Status : Answered
Chosen Option :

CY CHEMISTRY

Q.1 For an enzyme catalyzed reaction, the plot of inverse of initial rate against inverse of initial substrate concentration is linear with slope 0.16 s and intercept 2.12 mol^{-1} L s. The estimated value of Michaelis constant (in mol L^{-1}, *rounded off to two decimal places*) is _____

Given Answer :

ANSWER = 0.08

Question ID : 2672363949
Status : Answered

Q.2 When three moles of helium is mixed with one mole of neon at constant temperature and pressure (25 °C, 1 atm), the entropy of mixing (in J K^{-1}, *rounded off to two decimal places*) is _____

(Given: R = 8.314 J K^{-1} mol^{-1})

ANSWER: 18.69

Given Answer :

Question ID : 2672363947
Status : Answered

Q.3 Fluorescence quantum yield and fluorescence lifetime of a molecule are 0.4 and 5×10^{-9} s, respectively. If the fluorescence decay rate constant is $Y \times 10^{7}$ s^{-1}, the value of Y (*rounded off to nearest integer*) is _____

Given Answer :

ANSWER: 8

Question ID : 2672363950
Status : Answered

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Q.4 In oxyhemocyanin, the coordination number, mode of oxygen binding, color and the net magnetic behavior of copper ions, respectively are:

(Given: atomic number of Cu is 29)

Options 1 Five, μ-η^2:η^2-O_2^-, colorless and paramagnetic.

2 Five, μ-η^2:η^2-O_2^{2-}, blue and diamagnetic.

3 Four, μ-η^1:η^1-O_2^-, colorless and paramagnetic.

4 Four, μ-η^1:η^1-O_2^{2-}, blue and diamagnetic.

OPTION: 2

Question ID : 2672363935
Status : Answered
Chosen Option :

Q.5 The maximum number of microstates for d^2 electronic configuration is _____

Given Answer :

ANSWER: 45

Question ID : 2672363943
Status : Answered

Q.6 At 25 °C, the *emf* (in volts, *rounded off to three decimal places*) of the cell,

Ag | AgBr(s) | Br^- (a = 0.20), Cu^{2+} (a = 0.48), Cu^+ (a = 0.24) | Pt

is _____

(Given: The standard *emf* of the cell is 0.082 V; R = 8.314 J K^{-1} mol^{-1}; F = 96500 C mol^{-1})

Given Answer :

ANSWER: 0.058

Question ID : 2672363948
Status : Answered

Q.7 The **CORRECT** statement regarding the substitution of coordinated ligands in $Ni(CO)_4$ and $Co(NO)(CO)_3$ is:

(Given: Co–N–O bond is nearly linear; atomic numbers of Co and Ni are 27 and 28, respectively)

Options 1. Both $Ni(CO)_4$ and $Co(NO)(CO)_3$ follow associative pathway.

2. $Ni(CO)_4$ and $Co(NO)(CO)_3$ follow dissociative and associative pathways, respectively.

3. $Ni(CO)_4$ and $Co(NO)(CO)_3$ follow associative and dissociative pathways, respectively.

4. Both $Ni(CO)_4$ and $Co(NO)(CO)_3$ follow dissociative pathway.

OPTION: 2

Question ID : 2672363933
Status : Not Attempted and Marked For Review
Chosen Option :

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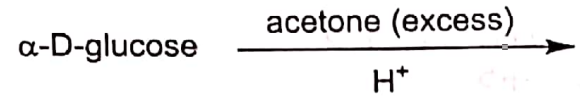
Q.8 The activity of 'm' molal $CuSO_4$ solution can be expressed in terms of its mean activity coefficient ($\gamma_\pm$) as:

Options
1. $16m^4\gamma_\pm^{\ 4}$
2. $4m^3\gamma_\pm^{\ 3}$
3. $m^2\gamma_\pm^{\ 2}$
4. $108m^5\gamma_\pm^{\ 5}$

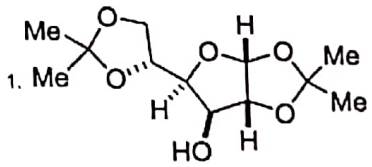
OPTION: 3

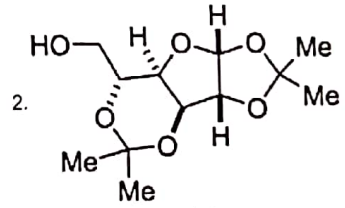
Question ID : **2672363939**
Status : **Answered**
Chosen Option :

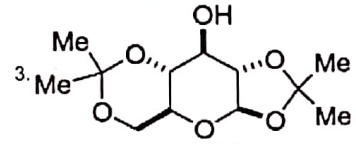
Q.9 Major product formed in the given reaction is:

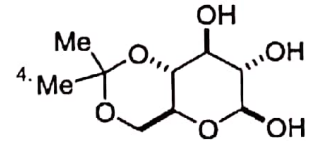


Options

1.


2.


3.


4.


OPTION: 1

Question ID : **2672363932**
Status : **Answered**
Chosen Option :

Q.10 For a cubic crystal system, the powder X-ray diffraction pattern recorded using Cu K_α source (λ = 1.54 Å) shows a peak at 33.60° (2θ) for (111) plane. The lattice parameter 'a' (in Å, *rounded off to two decimal places*) is _____

Given Answer : ANSWER: 4.62

Question ID : **2672363945**
Status : **Answered**

Q.11 The character table for a pyramidal AB_3 molecule of C_{3v} point group is given below:

C_{3v}	E	$2C_3$	$3\sigma_v$		
A_1	1	1	1	z	$x^2 + y^2, z^2$
A_2	1	1	−1	R_z	
E	2	−1	0	$(x,y)(R_x, R_y)$	$(x^2-y^2, xy)(xz, yz)$

The reducible representation of pyramidal AB_3 is

C_{3v}	E	$2C_3$	$3\sigma_v$
Γ	12	0	2

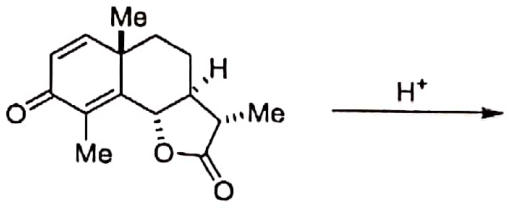
The **CORRECT** option representing all the normal Raman active modes of pyramidal AB_3 is:

Options
1. $2A_1 + 2E$
2. $3E$
3. $3A_1 + A_2 + E$
4. $A_1 + A_2 + 2E$

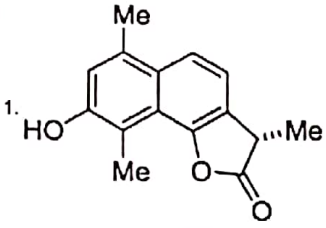
OPTION: 1

Question ID : **2672363940**
Status : **Answered**
Chosen Option :

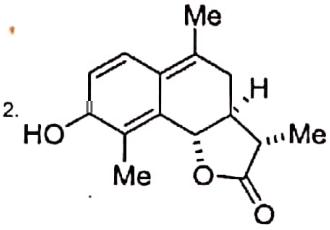
Q.12 Major product formed in the following reaction is:

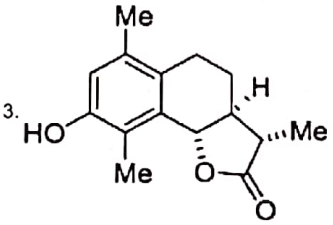


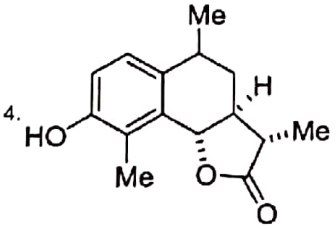
Options

1. 

OPTION: 3

2. 

3. 

4. 

Question ID : 2672363928
Status : Answered
Chosen Option :

Q.13 Among the following species, the one that has pentagonal shape is:

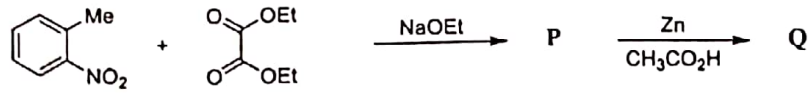
(Given: atomic numbers of O, F, S, I and Xe are 8, 9, 16, 53 and 54, respectively)

Options
1. $[XeF_5]^-$
2. $XeOF_4$
3. IF_5
4. $[SF_5]^-$

OPTION: 1

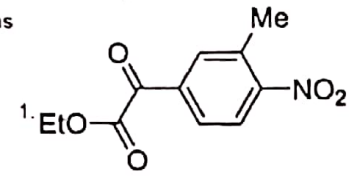
Question ID : 2672363936
Status : Answered
Chosen Option :

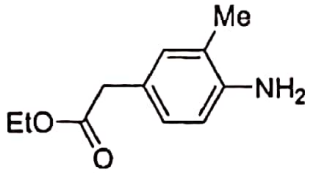
Q.14 In the following reaction sequence.



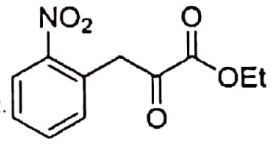
the major products P and Q are:

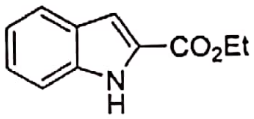
Options

1. 

P and 

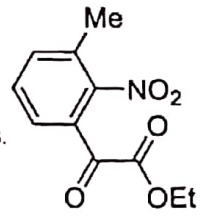
Q

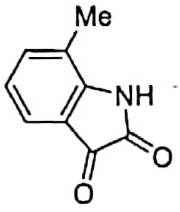
2. 

P and 

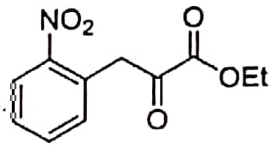
Q

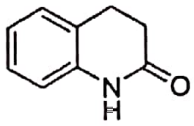
OPTION: 2

3. 

P and 

Q

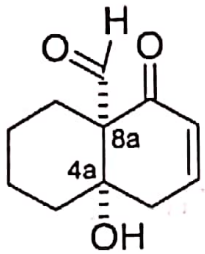
4. 

P and 

Q

Question ID : **2672363931**
Status : **Answered**
Chosen Option :

Q.15 Absolute stereochemistry of the given compound is:



Options 1. 4a*S*, 8a*R*
2. 4a*R*, 8a*S*
3. 4a*R*, 8a*R*
4. 4a*S*, 8a*S*

OPTION: 1

Question ID : **2672363930**
Status : **Answered**
Chosen Option :

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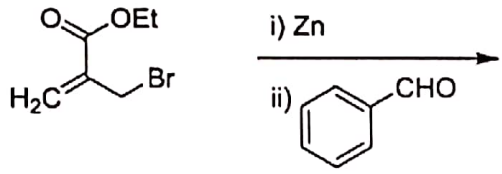
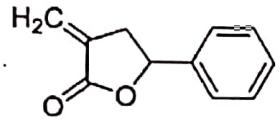
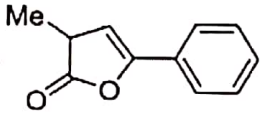
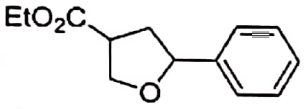
Q.16 Major product formed in the following transformation is:

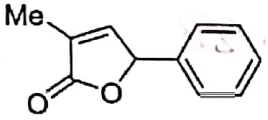


Options

1. 

2. 

3. 

4. 

OPTION: 1

Question ID : **2672363929**
Status : **Answered**
Chosen Option :

Q.17 In an NMR spectrometer operating at a magnetic field strength of 16.45 T, the resonance frequency (in MHz, *rounded off to one decimal place*) of ^{19}F nucleus is _____

(Given: g factor of $^{19}F = 5.255$; $\beta_N = 5.05 \times 10^{-27}$ J T^{-1}; $h = 6.626 \times 10^{-34}$ J s)

Given Answer :

ANSWER: 658.8

Question ID : **2672363946**
Status : **Answered**

Q.18 Among the following, the suitable reagents for the given transformation is:

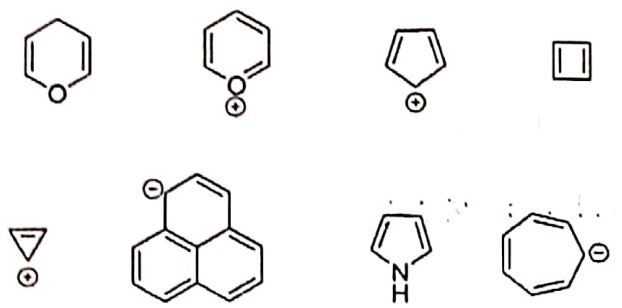
Major

Options 1. $NaBH_4$ / $CeCl_3 \cdot 7H_2O$
2. $H_2N–NH_2$ / KOH, Δ
3. Li / Liq. NH_3
4. H_2, Pd / C

OPTION: 1

Question ID : **2672363926**
Status : **Answered**
Chosen Option :

Q.19 Among the following,



the total number of aromatic species is _____

Given Answer :

ANSWER: 4

Question ID : **2672363942**
Status : **Answered**

Q.20 In a uranium recovery process, an aqueous solution of uranyl ion is evaporated, dried in air at 400 °C and subsequently reduced with hydrogen at 700 °C to obtain a uranium compound (**X**). The oxidation state of uranium in **X** is _____

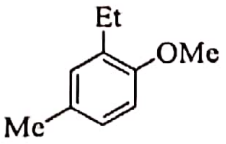
(Given: atomic number of U is 92)

Given Answer :

ANSWER: 4*

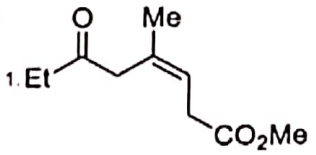
Question ID : **2672363944**
Status : **Answered**

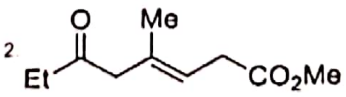
Q.21 Major product formed in the following reaction sequence is:

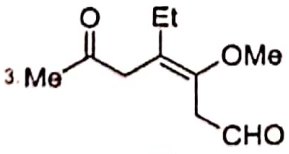


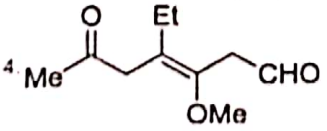
i) Li / liq. NH_3, *t*-BuOH
ii) O_3 (1 eq), MeOH, Me_2S

Options

1. 

2. 

3. 

4. 

OPTION: 1

Question ID : **2672363927**
Status : **Answered**
Chosen Option :

Q.22 A solution containing a metal complex absorbs at 480 nm with molar extinction coefficient of 15,000 L mol^{-1} cm^{-1}. If the path length of the cell is 1.0 cm and transmittance is 20.5%, the concentration (in mol L^{-1}) of the metal complex is:

Options
1. 1.37×10^{-5}
2. 4.59×10^{-5}
3. 8.75×10^{-5}
4. 2.29×10^{-5}

OPTION: 2

Question ID : **2672363937**
Status : **Answered**
Chosen Option :

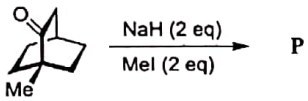
Q.23 Among the following linear combination of atomic orbitals, the **CORRECT** representation of the lowest unoccupied π-molecular orbital of butadiene is:

Options
1. $\Psi = 0.372\,\phi_1 + 0.602\,\phi_2 + 0.602\,\phi_3 + 0.372\,\phi_4$
2. $\Psi = 0.602\,\phi_1 - 0.372\,\phi_2 - 0.372\,\phi_3 + 0.602\,\phi_4$
3. $\Psi = -0.372\,\phi_1 + 0.602\,\phi_2 - 0.602\,\phi_3 + 0.372\,\phi_4$
4. $\Psi = 0.602\,\phi_1 + 0.372\,\phi_2 - 0.372\,\phi_3 - 0.602\,\phi_4$

OPTION: 2

Question ID : **2672363938**
Status : **Answered**
Chosen Option :

Q.24 In the following reaction,



the number of peaks exhibited by the major product **P** in its broadband proton decoupled ^{13}C NMR spectrum is _____

Given Answer :

ANSWER: 8

Question ID : **2672363941**
Status : **Answered**

Q.25 The **CORRECT** statement about hexagonal boron nitride is:

Options
1. It is reactive towards fluorine.
2. It has same layer stacking as that of graphite.
3. It is a good electrical conductor.
4. It has lower thermal stability in air compared to that of graphite.

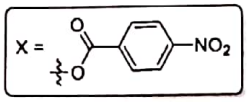
OPTION: 2

Question ID : **2672363934**
Status :
Chosen Option :

CAREER ENDEAVOUR

Q.26 The rate of solvolysis of the given compounds is in the order:

P Q R S T



Options 1. **R > T > Q > S > P**

2. **Q > T > R > P > S**

3. **T > Q > R > P > S**

4. **T > R > Q > S > P**

OPTION: 4

Question ID : **2672363957**
Status : **Answered**
Chosen Option :

Q.27 Assuming no interaction between vibrational and rotational energy levels in HF, the frequency (in cm^{-1}, *rounded off to the nearest integer*) of the R branch line originating from $J = 4$ in its IR spectrum is _____

(Given: Rotational constant for HF = 19.35 cm^{-1}; $\bar{\nu}_0 = 4138.52\ cm^{-1}$)

Given Answer :

ANSWER: 4332

Question ID : **2672363976**
Status : **Answered**

Q.28 The total number of $g_{||}$ lines expected in the EPR spectrum of a solution of bis(salicylaldimine) copper(II) having pure ^{63}Cu and ^{14}N at 77 K is _____

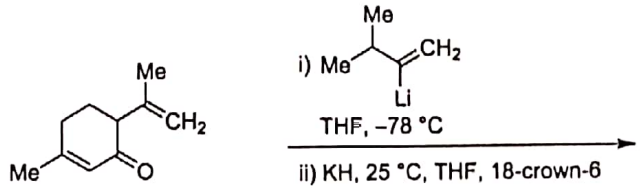
(Given: I values of ^{63}Cu, ^{14}N and ^{1}H are $\frac{3}{2}$, 1 and $\frac{1}{2}$, respectively)

Given Answer :

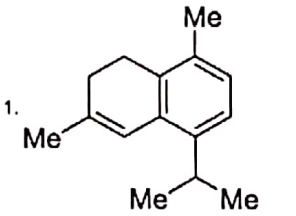
ANSWER: 60

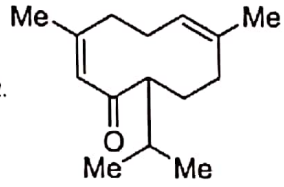
Question ID : **2672363972**
Status :

Q.29 Major product formed in the following synthetic sequence is:



Options

1.


2.


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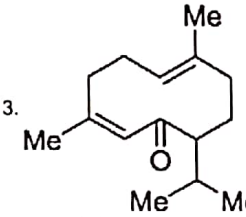
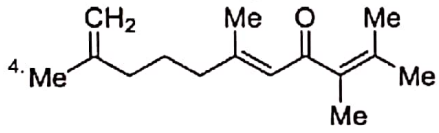


4.


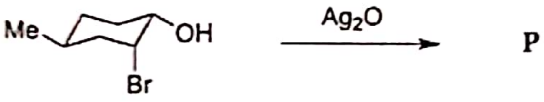
OPTION: 3

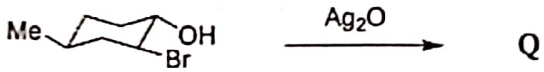
Question ID : **2672363955**

Status : **Not Attempted and Marked For Review**

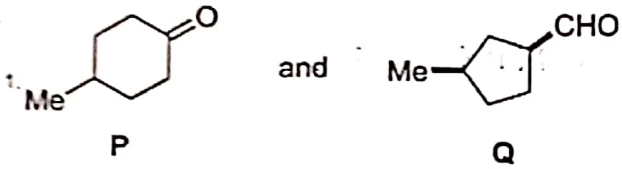
Chosen Option : -

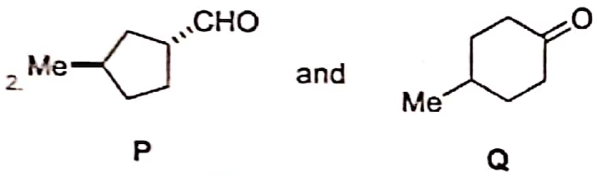
Q.30 Major products P and Q, formed in the reactions given below, are:



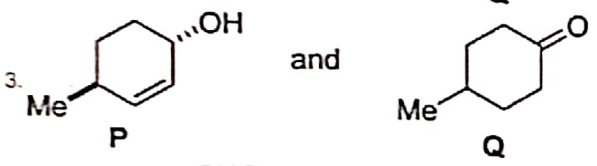


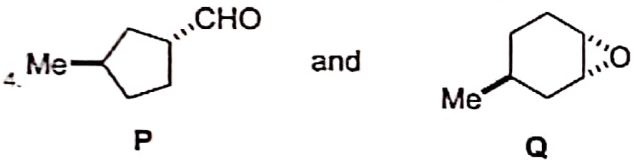
Options

1. 

2. 

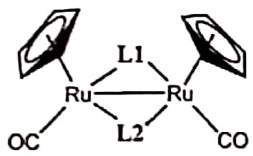
OPTION: 1

3. 

4. 

Question ID : **2672363953**
Status : **Answered**
Chosen Option : .

Q.31 The **CORRECT** combination of **L1** and **L2** among H^-, NO^-, $MeCH^{2-}$ and CO, that will satisfy the 18 electron rule for both metal centers in the following neutral molecule, is



(Given: atomic number of Ru is 44)

Options
1. $MeCH^{2-}$, CO
2. H^-, NO^-
3. $MeCH^{2-}$, NO^-
4. H^-, CO

OPTION: 1

Question ID : **2672363961**
Status : **Answered**
Chosen Option : .

CAREER ENDEAVOUR

Q.32 In the electronic absorption spectrum of an aqueous solution of $[Ni(NH_3)_6]^{2+}$, a very weak band is observed between the bands due to the transitions $^3A_{2g} \rightarrow {}^3T_{2g}$ and $^3A_{2g} \rightarrow {}^3T_{1g}(F)$. The transition responsible for the very weak band is

(Given: atomic number of Ni is 28)

Options 1. $^3A_{2g} \rightarrow {}^1E_g$

2. $^3A_{2g} \rightarrow {}^1T_{2g}$

3. $^3A_{2g} \rightarrow {}^1T_{1g}$

4. $^3A_{2g} \rightarrow {}^1A_{2g}$

OPTION: 1

Question ID : 2672363959
Status : Not Attempted and Marked For Review
Chosen Option : -

Q.33 The van der Waals constants a and b for gaseous CO are given as 1.49 L^2 atm mol^{-2} and 0.0300 L mol^{-1}, respectively. The fugacity (in atm, *rounded off to two decimal places*) of CO at 35 °C and 95 atm is _____

(Given: R = 0.082 L atm K^{-1} mol^{-1})

Given Answer :

ANSWER: 90.71*

Question ID : 2672363977
Status : Answered

Q.34 Among the following,

$[B_{12}H_{12}]^{2-}$, $[Ni_6(CO)_{12}]^{2-}$, $[C_2B_9H_{11}]^{2-}$, $Rh_6(CO)_{16}$, $Os_6(CO)_{20}$, B_5H_{11}, B_6H_{10}

the total number of species having *nido* structure is _____

(Given: atomic numbers of H, B, C, O, Ni, Rh and Os are 1, 5, 6, 8, 28, 45 and 76, respectively)

Given Answer :

ANSWER: 3

Question ID : 2672363973
Status : Answered

CAREER ENDEAVOUR

Q.35 The following table lists the reaction/conversion catalyzed by metalloenzymes.

Reaction / conversion		Metalloenzyme	
P	$R-H + O_2 + 2H^+ + 2e^- \rightarrow R-OH + H_2O$	I	Coenzyme B_{12}
Q	$O_2 + 4e^- + 8H^+ \rightarrow 2H_2O + 4H^+$	II	Cytochrome P-450
R	$2H_2O_2 \rightarrow 2H_2O + O_2$	III	Cytochrome *c* oxidase
S	$NH_2-CH_2-CO_2H \rightarrow NH_2-CH(CH_2OH)-CO_2H$	IV	Catalase

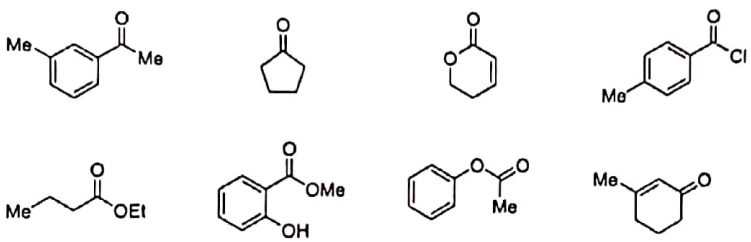
The **CORRECT** combination is

Options
1. **P-IV; Q-III; R-II; S-I**
2. **P-II; Q-III; R-IV; S-I**
3. **P-I; Q-IV; R-III; S-II**
4. **P-II; Q-I; R-III; S-IV**

OPTION: 2

Question ID : **2672363963**
Status : **Answered**
Chosen Option :

Q.36 Among the following,



the total number of compounds showing characteristic carbonyl stretching frequency less than 1700 cm^{-1} in their IR spectra is _____

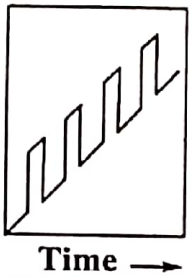
Given
Answer :

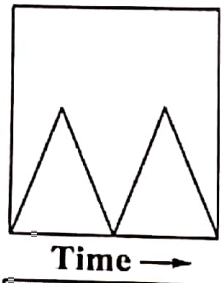
ANSWER: 3

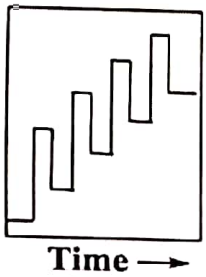
Question ID : **2672363970**
Status : **Answered**

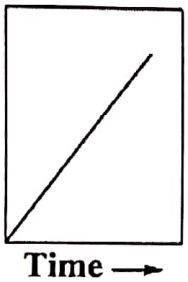
Q.37 The **CORRECT** 'voltage (E) *versus* time' excitation signal used in cyclic voltammetry is

Options

1. 

2. 

3. 

4. 

OPTION: 2

Question ID : **2672363965**
Status : **Not Attempted and Marked For Review**
Chosen Option : -

Q.38 ΔG_f^0 and ΔH_f^0 for Fe(*g*) are 370.7 kJ mol^{-1} and 416.3 kJ mol^{-1} at 298 K, respectively. Assuming ΔH_f^0 is constant in the interval 250 K to 375 K, ΔG_f^0 (*rounded off to the nearest integer*) for Fe(*g*) at 375 K is:

Options
1. 325 kJ mol^{-1}
2. 338 kJ mol^{-1}
3. 310 kJ mol^{-1}
4. 359 kJ mol^{-1}

OPTION: 4

Question ID : **2672363967**
Status : **Answered**
Chosen Option : 4

Q.39 The frequency (in cm^{-1}, *rounded off to two decimal places*) for pure rotational line in the spectrum of NO molecule due to change in the quantum number from $J = 1$ to $J = 2$ is _____

(Given: Moment of inertia of NO = 1.6427×10^{-46} kg m^2; $h = 6.626 \times 10^{-34}$ J s; $c = 3 \times 10^8$ m/s)

Given Answer :

ANSWER: 6.82

Question ID : **2672363974**
Status : **Answered**

Q.40 For the ring opening reaction of cyclopropane to propene at 25 °C, the pre-exponential factor is 4.3×10^{15} s^{-1}. The entropy of activation (in J K^{-1} mol^{-1}, *rounded off to two decimal places*) is _____

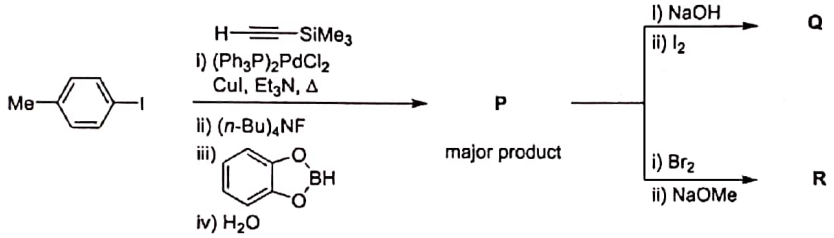
(Given: $h = 6.626 \times 10^{-34}$ J s; $k_B = 1.38 \times 10^{-23}$ J K^{-1}; R = 8.314 J K^{-1} mol^{-1})

Given Answer :

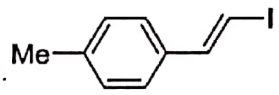
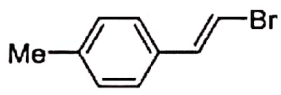
ANSWER: 46.06

Question ID : **2672363979**
Status : **Answered**

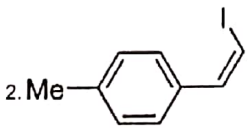
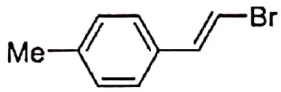
Q.41 In the following reaction sequence, the major products **Q** and **R** are:



Options

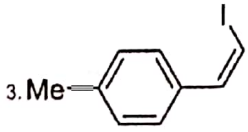
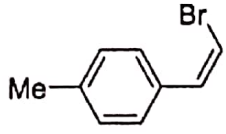
1.  and 

Q **R**

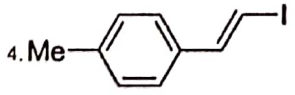
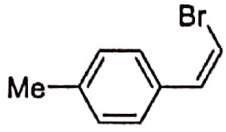
2.  and 

Q **R**

OPTION: 4

3.  and 

Q **R**

4.  and 

Q **R**

Question ID : **2672363958**
Status : **Not Attempted and Marked For Review**
Chosen Option : -

CAREER ENDEAVOUR

Q.42 The experimental magnetic moment (3.4 BM) of a hydrated salt of Eu^{3+} at 27 °C is significantly different from the calculated value. The difference is due to

(Given: atomic number of Eu is 63)

Options 1. population of electrons at higher *J* level(s) *via* thermal excitation.
2. pairing of electrons in *f*–orbitals.
3. strong ligand field splitting of *f*–orbitals.
4. strong spin–orbit coupling.

OPTION: 1

Question ID : **2672363960**
Status : **Answered**
Chosen Option :

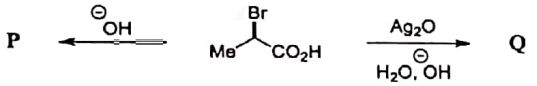
Q.43 Adsorption of N_2 on TiO_2 was carried out at 75 K. A plot of $\frac{z}{(1-z)v}$ *versus* z $(z = p/p^0)$ gives a straight line with an intercept, 4.0×10^{-6} mm^{-3} and slope, 1.0×10^{-3} mm^{-3}. The volume (*rounded off to the nearest integer*) corresponding to the monolayer coverage is:

Options 1. 555 mm^3
2. 690 mm^3
3. 996 mm^3
4. 785 mm^3

OPTION: 3

Question ID : **2672363968**
Status : **Not Answered**
Chosen Option : -

Q.44 The **CORRECT** statement with respect to the stereochemistry of α–hydroxy acids **P** and **Q** formed in the following reactions is:



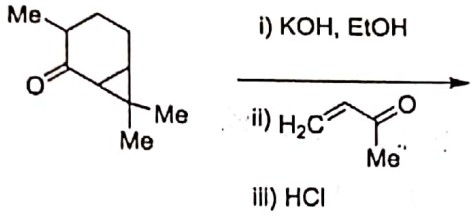
Options 1. **P** is formed with inversion of configuration and **Q** with retention of configuration.
2. **P** is formed with retention of configuration and **Q** with inversion of configuration.
3. Both **P** and **Q** are formed with retention of configuration.
4. Both **P** and **Q** are formed with inversion of configuration.

OPTION: 1

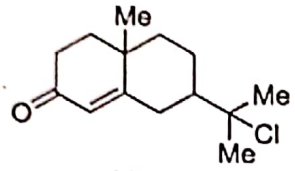
Question ID : **2672363956**
Status : **Answered**
Chosen Option :

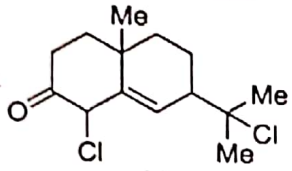
CAREER ENDEAVOUR

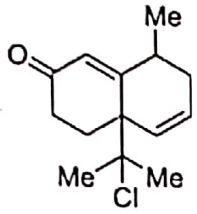
Q.45 Major product formed in the following reaction sequence is:

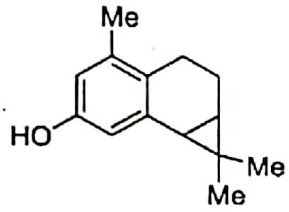


Options

1. 

2. 

3. 

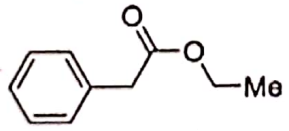
4. 

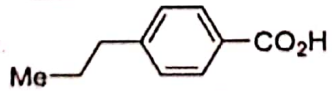
OPTION: 1

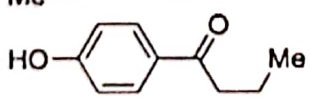
Question ID : **2672363951**
Status : **Not Attempted and Marked For Review**
Chosen Option : -

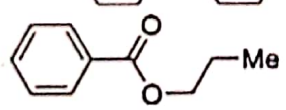
Q.46 A compound with molecular formula $C_{10}H_{12}O_2$ showed a strong IR band at ~ 1720 cm^{-1}, a peak at *m/z* 122 in the mass spectrum and the following ^1H NMR signals: δ 8.1–8.0 (2H, m), 7.6–7.5 (1H, m), 7.5–7.3 (2H, m), 4.3 (2H, t), 1.8 (2H, sextet) and 1.0 (3H, t). The structure of the compound is:

Options

1. 

2. 

3. 

4. 

OPTION: 4

Question ID : **2672363954**
Status : **Not Attempted and Marked For Review**
Chosen Option : -

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Q.47 At 30 °C, the vapor pressure and density of a 1.0 M aqueous solution of sucrose are 31.207 mm Hg and 1.1256 g/mL, respectively. If the vapor pressure of pure water at 30 °C is 31.824 mm Hg, the activity coefficient (*rounded off to three decimal places*) of water in the given solution is _____

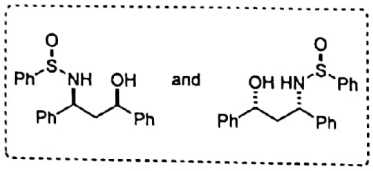
(Given: The molar mass of sucrose = 342.3 g mol^{-1})

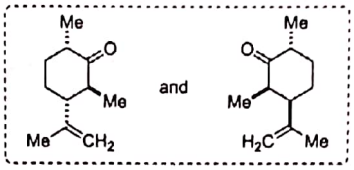
Given Answer :

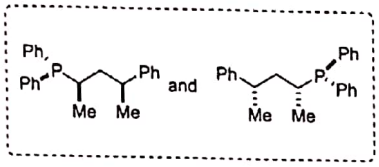
ANSWER: *

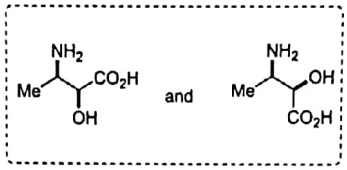
Question ID : **2672363978**
Status : **Answered**

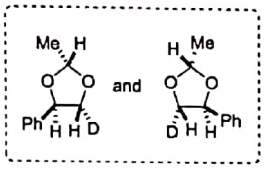
Q.48 Among the following sets,

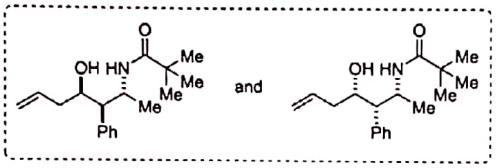












the total number of set(s) of diastereomeric pair(s) is _____

Given Answer :

ANSWER: 4

Question ID : **2672363969**
Status : **Answered**

Q.49 The % error (*rounded off to two decimal places*) in the ground state energy of a particle in a one dimensional box of length 'a' described by a trial variation function $\varphi = x(a-x)$, where $0 \le x \le a$, is _____

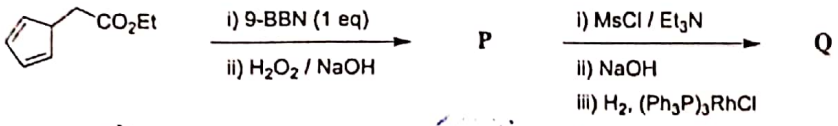
(Given: The true ground state energy of the above system is $h^2/8ma^2$; $\int_0^a \varphi^* \varphi \, d\tau = a^5/30$)

Given Answer :

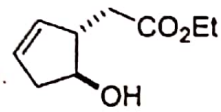
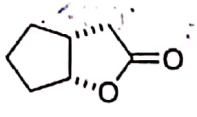
ANSWER: 1.32

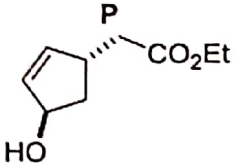
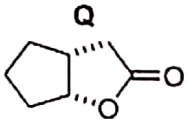
Question ID : **2672363975**
Status : **Answered**

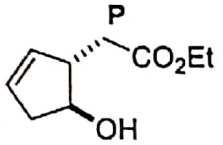
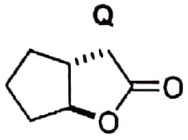
Q.50 Major products P and Q, in the given reaction sequence, are:

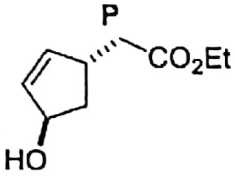
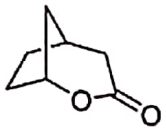


Options

1.  and 
P Q

2.  and 
P Q

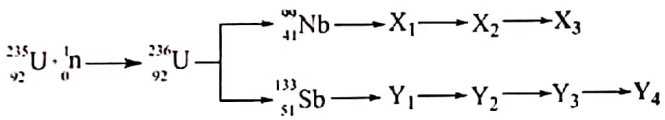
3.  and 
P Q

4.  and 
P Q

OPTION: 1

Question ID : **2672363952**
Status : **Answered**
Chosen Option :

Q.51 The fission reaction of $^{235}_{92}U$ with thermal neutron is represented below.



$^{99}_{41}Nb$ and $^{133}_{51}Sb$ are the primary fission fragment pair, which undergo series of radioactive decay to form stable nuclei X_3 and Y_4 (chain enders). The X_3 and Y_4, respectively are:

Options
1. $^{87}_{35}Br$ and $^{124}_{43}Tc$
2. $^{99}_{44}Ru$ and $^{133}_{55}Cs$
3. $^{93}_{38}Sr$ and $^{127}_{35}Ag$
4. $^{96}_{41}Nb$ and $^{130}_{51}Sb$

OPTION: 2

Question ID : **2672363964**
Status : **Answered**
Chosen Option :

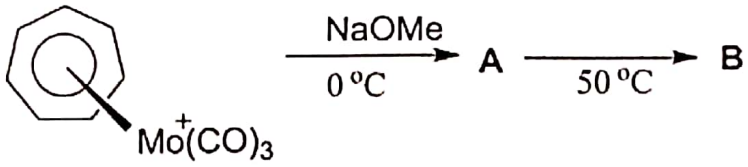
Q.52 Consider that AgX crystallizes in rock salt structure. The density of AgX is 6477 kg/m^3 and unit cell length is 577.5 pm. Atomic weight of Ag is 107.87 g mol^{-1}. The atomic weight of X (in g mol^{-1}, *rounded off to two decimal places*) is _____

Given
Answer :

ANSWER: 79.07

Question ID : **2672363971**
Status : **Answered**

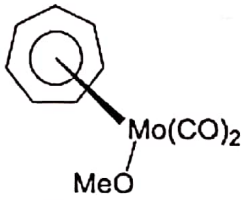
Q.53 In the following reaction sequence,

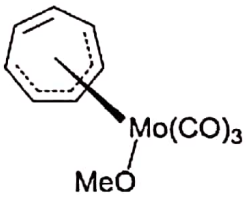


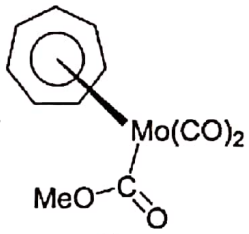
the structure of **B** is

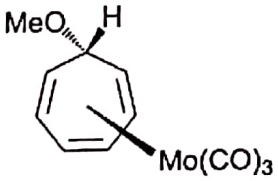
(Given: atomic number of Mo is 42)

Options

1. 

2. 

3. 

4. 

OPTION: 4

Question ID : **2672363962**
Status : **Answered**
Chosen Option : 4

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Q.54 The hydrogen-like radial wave function of the 3*s* orbital is given as

$$R_{3,0} = \frac{1}{9\sqrt{3}}\left(\frac{Z}{a_0}\right)^{3/2}\left(6 - 2\rho + \frac{\rho^2}{9}\right)e^{-\rho/6}$$

where $\rho = 2Zr/a_0$; Z = atomic number; r = distance from the nucleus and a_0 = Bohr radius.

Positions of the radial nodes (in units of a_0) of the 3*s* orbital are at

Options

1. $\frac{3+\sqrt{3}}{2Z}, \frac{3-\sqrt{3}}{2Z}$
2. $\frac{6+3\sqrt{3}}{2Z}, \frac{6-3\sqrt{3}}{2Z}$
3. $\frac{3+3\sqrt{3}}{2Z}, \frac{3-3\sqrt{3}}{2Z}$
4. $\frac{9+3\sqrt{3}}{2Z}, \frac{9-3\sqrt{3}}{2Z}$

OPTION: 4

Question ID : **2672363966**
Status : **Not Attempted and Marked For Review**
Chosen Option : **--**

Q.55 In a reaction, reactant **X** is converted to products **Y** and **Z** consecutively with rate constants 6.0×10^{-2} min^{-1} and 9.0×10^{-3} min^{-1}, respectively. If the initial amount of **X** is 12.5 moles, the number of moles (*rounded off to one decimal place*) of **Y** formed after 10 minutes is _____

Given Answer :

ANSWER: 5.4

Question ID : **2672363980**
Status : **Answered**

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GATE 2020 | CHEMISTRY-CY

ANSWER KEY					GATE 2020
SECTION : GENERAL APTITUDE		SECTION : CY-CHEMISTRY			
Q. NO.	ANSWER	Q. NO.	ANSWER	Q. NO.	ANSWER
1.	4	1.	0.08	29.	3
2.	3	2.	18.69	30.	1
3.	4	3.	8	31.	1
4.	4	4.	2	32.	1
5.	2	5.	45	33.	90.71*
6.	2	6.	0.058	34.	3
7.	2	7.	2	35.	2
8.	1	8.	3	36.	3
9.	2	9.	1	37.	2
10.	1	10.	4.62	38.	4
		11.	1	39.	6.82
		12.	3	40.	46.06
		13.	1	41.	4
		14.	2	42.	1
		15.	1	43.	3
		16.	1	44.	1
		17.	658.8	45.	1
		18.	1	46.	4
		19.	4	47.	*
		20.	4*	48.	4
		21.	1	49.	1.32
		22.	2	50.	1
		23.	2	51.	2
		24.	8	52.	79.07
		25.	2	53.	4
		26.	4	54.	4
		27.	4332	55.	5.4
		28.	60		

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