

Government Unani Medical College, Ganderbal.

QUESTION CUM ANSWER BOOKLET

[Time: 60 Minutes]

[Maximum Marks: 60]

Name of the Candidate

Parentage

Residence

Roll Number

Date of Examination:-

17th December, 2022.

Post Applied For

: ANALYTICAL CHEMIST

Number of Questions in Booklet = 60

Important Instructions

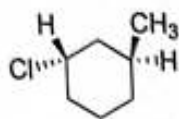
Please read the following instruction carefully

1. Write down the above entries carefully in the question cum answer booklet in (BLOCK LETTERS) and sign at the appropriate place.
2. Each objective question is followed by four responses. Your task is to choose the correct response and write it in the box adjacent to each question.
3. Please mark the right response only with BLUE/BLACK ball point pen. Use of pencil and Gel Pen is not allowed.
4. Candidates are not allowed to carry any Paper, Notes, Books, Mobile Phones, Scanning Devices, Pagers, Electronic Gadgets, etc. to the Examination Hall. Any candidate found using or in possession of such unauthorized material, including in copying or impersonation or adopting unfair means, is liable to be disqualified.
5. After finishing the examination, handover the booklet to the Invigilator/Hall Superintendent. DO NOT carry Question-Answer booklet or any part of it outside the Examination Hall.
6. All questions are compulsory. There will be no negative marking.
7. No break is permitted during the test.
8. In case you finish answering all the questions well before the allotted time, you can review your answers in the remaining time. However, you can't leave the Centre before completion of the allotted time.
9. In case of any defect, misprint, missing questions or duplication of questions; get the question-answer booklet changed. No complaint shall be entertained after the test.
10. Do not use eraser, fluid pen, blades, etc. otherwise your answer/response(s) will be rejected.
11. Scratching, overwriting, tick-marks and multiple answers will be considered wrong & no credit will be given for such answers.
12. Please sign each page of this booklet at the space earmarked for your signatures.

[Type text]

<hr/> Signature of Candidate	<hr/> Signature of Invigilator	<hr/> Signature of Evaluator
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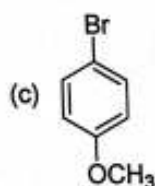
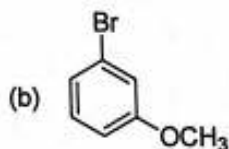
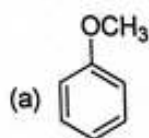
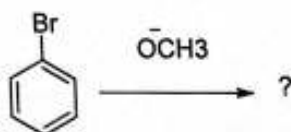
Q1. The correct IUPAC name for the following compound is:



- (A) (1R, 3R)-1-chloro-3-methylcyclohexane (B) (1R, 3S)-1-chloro-3-methylcyclohexane
 (C) (1S, 3S)-1-chloro-3-methylcyclohexane (D) (1S, 3R)-1-chloro-3-methylcyclohexane

c

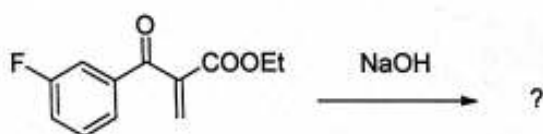
Q2. Chose the appropriate product formed in the given reaction sequence?



(d) None of the given

d

Q3. Selective substrate reagent reaction follows?



- (a) 1,4 addition
 (b) ArSN2
 (c) Acid formation
 (d) Cyclization Reaction

c

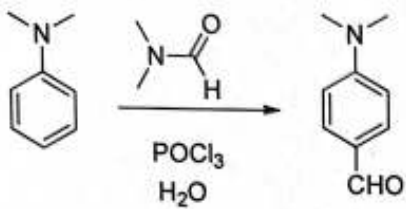
Q4. Cyclic ketone on reaction with per acid an oxygen insertion take place with lactone a final product, the reaction is?

- (a) Aldol condensation
 (b) Baeyer-Villiger Oxidation
 (c) Dieckmann Condensation
 (d) Fukuyama Coupling

b

Q5. The reaction conditions to product formation given below is ?

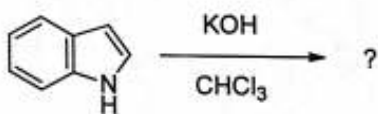
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- (a) Vilsmeier reaction
 (b) Gattermann formylation
 (c) Reimer Tiemann reaction
 (d) Mannich reaction

a

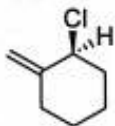
Q6. Identify the product formed in the given reaction?



- (a) (b)
- (c) (d)

a

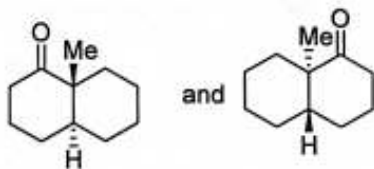
Q7. The configuration at the stereocentre in the compound given below is ?



- (a) 1R
 (b) 1S
 (c) 2R
 (d) 2S

b

Q8. The two compounds given below are?

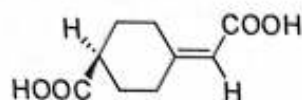


- (a) Enantiomers
 (b) Identical
 (c) Diastereomers
 (d) Regioisomers

b

Sig. of the candidate: _____

Q9. The following molecule has



- (a) Plane of symmetry
 (b) R configuration
 (c) S configuration
 (d) Center of symmetry

b

Q10. The IR stretching frequency of $C\equiv N$ can be observed at

- (a) 2250
 (b) 2350
 (c) 2150
 (d) 2700

a

Q11. Chose the accurate $C=C$ double bond length?

- (a) 134 pm
 (b) 142 pm
 (c) 120 pm
 (d) 138 pm

a

Q12. Chose the suitable catalyst used to carry aromatic electrophilic substitution reactions ?

- (a) PEGs
 (b) Ionic liquids
 (c) $FeBr_3$
 (d) $Pd(OAc)_2$

c

Q13. Correctly matched structure and carbonyl stretching frequency set is

Column A		Column B	
P.		X.	1750 cm^{-1}
Q.		Y.	1770 cm^{-1}
R.		Z.	1800 cm^{-1}

- (a) P-Y, Q-Z, R-X
 (b) P-Y, Q-X, R-Z
 (c) P-Z, Q-Y, R-X
 (d) P-X, Q-Z, R-Y

a

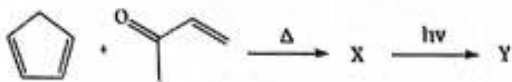
Q14. The number of chemical shift non-equivalent protons expected in the 1H NMR spectrum of α -pinene is

- (a) 7
 (b) 8
 (c) 9
 (d) 10

d

Sig. of the candidate: _____

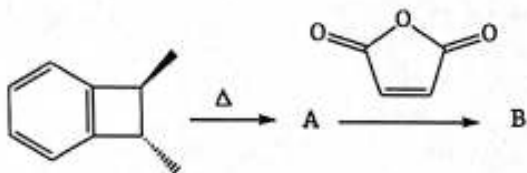
Q15. The structures of major products X and Y in the following transformation are ?



- (a)
- (b)
- (c)
- (d)

(c)

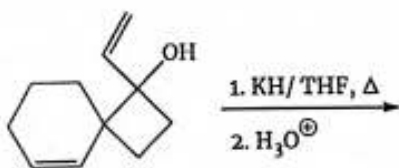
Q16. The major products A and B in the following reaction sequence are?



- (a) A = B =
- (b) A = B =
- (c) A = B =
- (d) A = B =

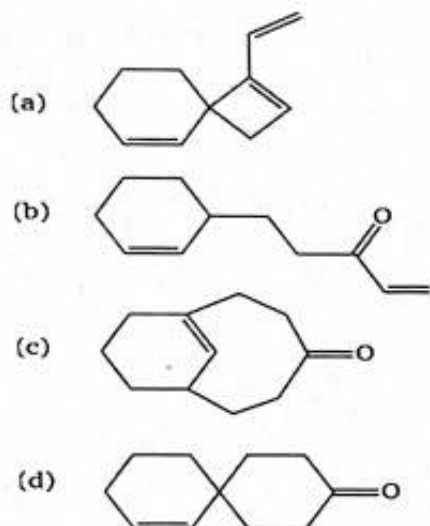
(b)

Q17. The major product in the following reaction is ?

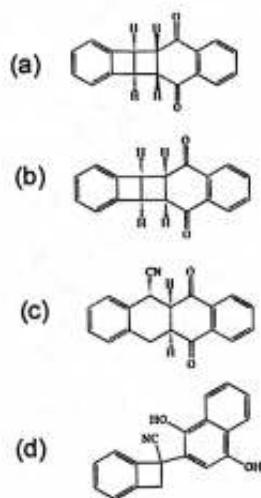
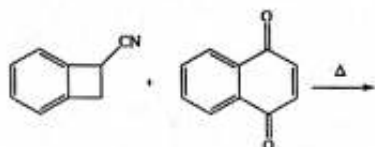


(c)

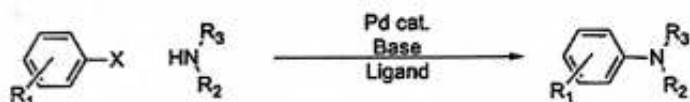
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Q18. The major product formed in the following reaction is ?



Q19. Which of the following is the known name for the reaction given below?



(where, X=Cl, Br, I, OTf; R2=Alkyl, aryl, H; R3=alkyl, aryl)

- (a) Ullmann reaction
 (b) Gabriel phthalimide synthesis
 (c) Buchwald-Hartwig Reaction
 (d) Chan-Lam coupling



Sig. of the candidate: _____

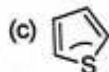
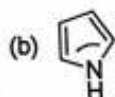
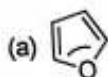
Q20. In which of the following reactions lead tetraacetate is used to cleave a carbon-carbon bond in a glycol?

- a) Swern oxidation
c) Jones oxidation

- b) Criegee oxidation
d) Baeyer-Villiger Oxidation

b

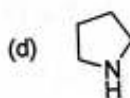
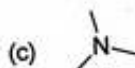
Q21. Chose the molecule with smallest carbon hetero carbon bond angle ?



- (d) All C-Hetero-C, angles are same

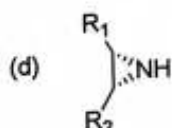
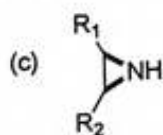
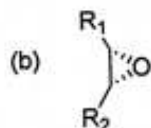
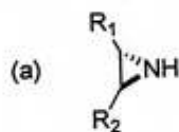
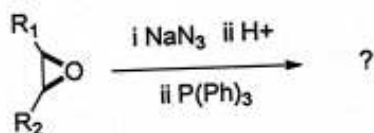
c

Q22. Which among the following is the strongest base?



a

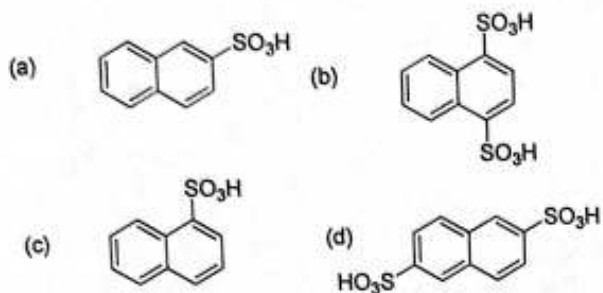
Q23. Chose an appropriate product of the given reaction sequence?



d

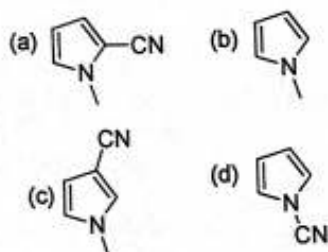
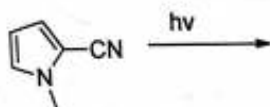
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Q24 The reaction of Naphthalene with Oleum, gives the major product A, the A is ?



a

Q25. 1-methyl-1H-pyrrole-2-carbonitrile on irradiation ($h\nu$) produce ?



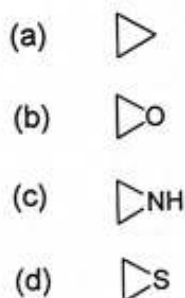
c

Q26 Furan on reaction with diazomethane in presence of $h\nu$ gives ?

- (a) Bicyclic compounds
 (b) Tricyclic compound
 (c) Saturated monocyclic compound
 (d) None of the above

a

Q27. From the given three membered cyclic molecules, chose the most unstable one?



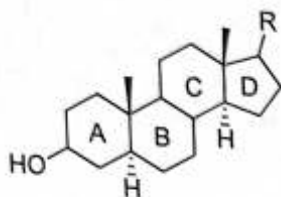
d

Q28 Which among the following class of compounds behave as umpolongs?

- (a) NHCs
 (b) Carbens
 (c) Free radicals
 (d) Triphenyl cations

a

Q29. In the below given cyclic system the ring C & D have ?



- a) Cis fusion
c) Planer fusion

- b) Trans Fusion
d) Can't be predicted

b

Q30. The caffeine can be detected by

- a) Dragendorff's reagent
c) Ninhydrin

- b) Ceric ammonium nitrate (CAN)
d) All the above given

a

Q31. Identify the suitable product formed in darzens reaction ?

- (a) Tertiary alcohol
(c) Alcoholic ester

- (b) Epoxy ester
(d) Amides

b

Q32. In Witting reaction the cyclic intermediated formed is

- (a) Cyclic phosphene
(c) Oxyphosphene

- (b) Oxaphosphetane
(d) Phosphetane

b

Q33. MnO_2 is a mild oxidizing agent used to oxidize?

- (a) Secondary allylic alcohols
(c) both a & b

- (b) Benzylic alcohols
(d) none of the above

c

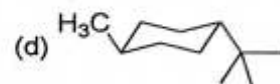
Q34. Which among the following is an alkaloid?

- (a) Nicotinic acid
(c) Emodin

- (b) Chrysophanol
(d) Furan -2-carbaldehyde

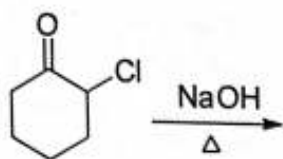
a

Q35 The correct chair form of the given substituted cyclohexane will be ?



a

Q36. Find the suitable product from the given reaction?



- (a)
- (b)
- (c)
- (d)

a

Q37. Simmons-Smith reaction is an organic cheletropic reaction used for the synthesis of?

- (a) Alcohols (b) Polycyclic ring systems
(c) Cyclopropane ring systems (d) Aromatic ring systems

c

Q38. Which is the mild reducing agent and reduces only carbonyl group in presence of nitro, carboxyl, double bond and ester groups?

- a) LiAlH_4 (b) Na-NH_3
c) NaBH_4 (d) $\text{H}_2\text{-Ni}$

c

Q39. Which is the correct combination of reagent which can carry out following conversion?



- (a) (i) $\text{CH}_3\text{-MgBr}$ then H^+ (ii) $\text{H}_2\text{SO}_4 / \Delta$ (iii) $\text{NH}_2\text{-NH}_2 / \text{KOH}$
(b) (i) $(\text{CH}_3)_2\text{CuLi}$ then H^+ (ii) $\text{NaBH}_4 / \text{EtOH}$ (iii) $\text{H}_2\text{SO}_4 / \Delta$
(c) (i) $\text{CH}_3\text{-Li}$, then H^+ (ii) PCC / Δ
(d) (i) $\text{NaBH}_4 \cdot \text{CeCl}_3$ then H^+ (ii) MnO_2 (iii) $\text{CH}_3\text{-Li}$

c

Q40. What is used to carry out the following conversion?

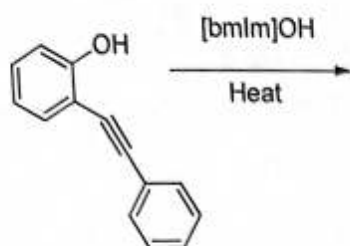


- a) hydroboration oxidation followed by Jones oxidation
b) Wacker oxidation followed by haloform reaction
c) oxymercuration-determination followed by Jones oxidation
d) ozonolysis followed by haloform reaction

b

Sig. of the candidate: _____

Q41 The product formed in the given reaction pattern will be

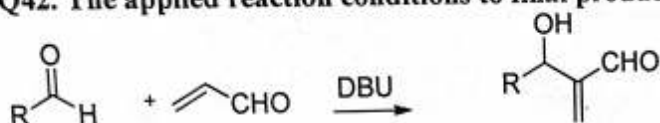


- a) Substituted Benzoxazine
c) Oxirane

- b) Substituted Benzofuran
d) Substituted Oxirane

b

Q42. The applied reaction conditions to final product, presents which name reaction?



- a) Ullmans reaction
c) Deckin Reaction

- b) Baylis-Hilman Reaction
d) Sharpless Asymmetric Synthesis

b

Q43 The Versatile alkylating agent is?

- a) Vitamin B12
c) Vitamin D

- b) Vitamin A
d) None of the Above

a

Q44. Formyl cation intermediate is formed in the following name reaction

- a) Wittig reaction
c) Mannich Reaction

- b) Aldol Condensation Reaction
d) Gatterman-Koch Reaction

d

Q45. Reaction between 1-fluoro-2-nitrobenzene and Morpholine follows

- a) Addition mechanism
c) ArSN2 mechanism

- b) Elimination mechanism
d) ArSN1 mechanism

c

Q46 On heating benzene diazonium in an appropriate amount of water with an expected product phenol follows?

- a) SN1 mechanism
c) ArSN2 mechanism

- b) SN2 mechanism
d) ArSN1 mechanism

d

Q47 The reaction between diazonium salt and phenol in presence of NaOH is a?

- a) C-N coupling
c) Substitution

- b) C-C coupling
d) Elimination

a

Q48 Reaction of cyclohexanone with dimethylamine in presence of H^+ form?

- a) Enamine product
c) Amine product

- b) Iminium ion
d) N,N dimethyl amino benzene

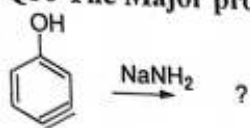
a

Q49. Chose the true statement regarding Carbenes ?

- (a) Singlet Carbene is more stable than Triplet Carbene
(b) Triplet Carbene is more stable than singlet carbene
(c) Both are equally stable
(d) They are nucleophilic nature

b

Q50 The Major product in the given reaction will be?



- (a) (b)
- (c) (d)

b

Q51 Which among the given molecules have zero dipole moment

- (a) 1,4-dichlorobenzene
 (b) 1,4-dihydroxybenzene
 (c) 1,3-difluorobenzene
 (d) 1,2,4-trichlorobenzene

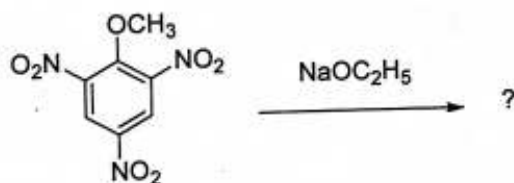
a

Q52 The most stable conformation of ethylene glycol is ?

- (a) (b)
 (c) (d)

b

Q53 The reaction between 2-methoxy-1,3,5-trinitrobenzene and sodium ethanolate gives?

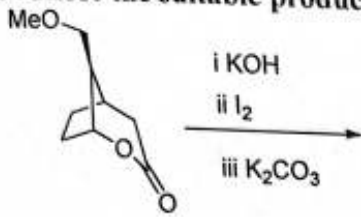


- a) Meisenheimer Complex
 c) Olefinic complex

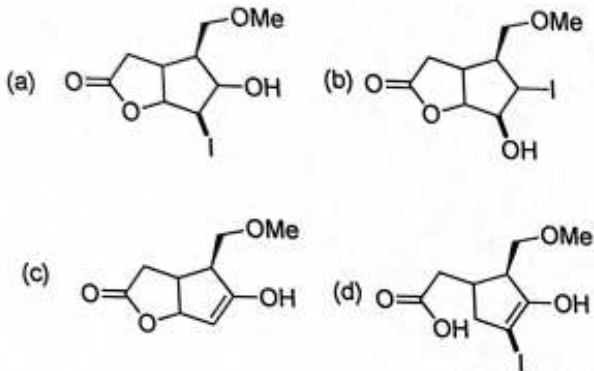
- b) Zeis Complex
 d) Arinium Ion Complex

a

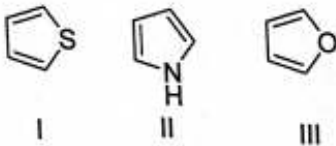
Q54 Chose the suitable product from the below given reaction?



a



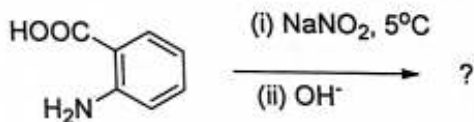
Q55 Chose the correct aromatic order of the given heterocyclic compounds?



- (a) I>II>III
 (b) II>I>III
 (c) III>I>II
 (d) III>II>I

a

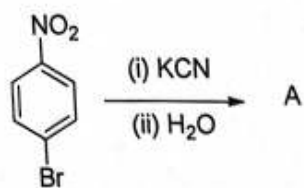
Q56 In the established protocol given as under what will be the final product?



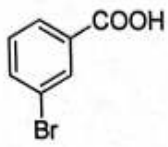
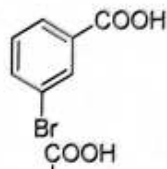
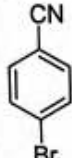
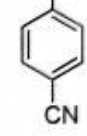
- (a) Benzyne
 (b) Benzoic acid
 (c) Ortho hydroxyl benzoic acid
 (d) Para nitro benzoic acid

a

Q57 Choose an appropriate rearrangement and the product in the given reaction sequence?



a


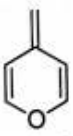
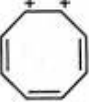
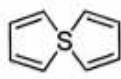
- (a) Von Richter Rearrangement &  (b) Somlet Hauser Rearrangement & 
- (c) Fries Rearrangement  (d) Smiles Rearrangement & 

Q58 The most reactive site in pyridine for aromatic electrophilic substitution reaction is?

- (a) C3
(b) C2
(c) C4
(d) C3=C4

a

Q59 Which among the following can behave as homoaromatic?

- a 
- b 
- c 
- d 

a

Q60 The cAMP is considered main energy source in our body, chose the correct statement?

- (a) The above given statement about cAMP is true
(b) The above given statement about cAMP is false
(c) Both a & b
(d) None

b