1. Which of the following species is an electrophile

(1) RNH_2 (2) SO_3 (3) $NO_3^{\ominus}$ (4) ROH

2. Which of the following acts as a nucleophile?

(1) $\overset{\oplus}{N}O_2$ (2) $:CCl_2$ (3) $\overset{\ominus}{N}H_2$ (4) $^{\bullet}CH_3$

3. Which of the following contains only three pair of electrons :

(1) Carbanion (2) Carbocation

(3) Carbon free radical (4) None

4. Carbanion is a :-

(1) Base (2) Nucleophile

(3) Both the above (4) None

5. In which structure carbon does not act as a electrophile.

(1) $CH_3–CH_2–Cl$ (2) $CH_3–CO–CH_3$

(3)  (4) $CH_3–CN$

6. Wrong statement regarding methyl carbonium ion $(\overset{\oplus}{C}H_3)$.

(1) It is sp^2 hybridised

(2) Vacant orbital is sp^2 hybridised

(3) Vacant orbital is perpendicular to molecular planar and in pure p-orbital

(4) It is electrophile with sextet of electron

7. $\overset{\ominus}{C}H_3$ is less stable than :-

(1) $CH_3—\overset{\ominus}{C}H_2$ (2) $CH_3—\overset{\ominus}{C}H—CH_3$

(3) $\overset{\ominus}{C}H_2—NO_2$ (4) $CH_3—\overset{\ominus}{C}H—C_2H_5$

8. Decreasing order of –I effect of the triad [$–NO_2$, $–\overset{\oplus}{N}H_3$, –CN] is :-

(1) $–\overset{\oplus}{N}H_3 > –NO_2 > –CN$

(2) $–\overset{\oplus}{N}H_3 > –CN > NO_2$

(3) $–CN > –NO_2 > –\overset{\oplus}{N}H_3$

(4) $–NO_2 > –CN > –\overset{\oplus}{N}H_3$

9. Most stable carbanion is :-

(1) $HC\equiv\overset{\ominus}{C}$ (2) $H_2C=\overset{\ominus}{C}H$

(3) $CH_3–\underset{CH_3}{\overset{CH_3}{C}}—\overset{\ominus}{C}H_2$ (4) $CH_3–\underset{CH_3}{C}=\overset{\ominus}{C}H$

10. The correct order of stability of given carbanions will be :-

$CH_3–\overset{\ominus}{C}H_2$ (I) $CH_2=\overset{\ominus}{C}H$ (II) $HC\equiv\overset{\ominus}{C}$ (III)

(1) I > II > III (2) III > II > I

(3) I > III > II (4) II > I > III

11. Which is most basic among the following :-

(1) CH_3NH_2 (2) $CH_3CH_2NH_2$

(3) NH_3 (4) $(CH_3)_2CHNH_2$

12. Which of the following has maximum pK_a :-

(1) CH_2FCOOH (2) $CH_2ClCOOH$

(3) CH_3COOH (4) HCOOH

13. Which of the following is most acidic ?

(1) Methoxy acetic acid (2) Acetic acid

(3) Chloro acetic acid (4) Trifluoroacetic acid

14. Which of the following show + I-effect :-

(1) – OH (2) $–OCH_3$ (3) $–CH_3$ (4) – Cl

15. Among the following the most highly ionised in water is:

(1) $CH_3CH_2CHClCOOH$

(2) $CH_3CH_2CCl_2COOH$

(3) $CH_3CHClCH_2COOH$

(4) $CH_2ClCH_2CH_2COOH$

16. The strongest acid amongst the following compounds is ?

(1) $CH_3CH_2CH(Cl)CO_2H$

(2) $ClCH_2CH_2CH_2COOH$

(3) CH_3COOH

(4) HCOOH

17. Which of the following acids is stronger than acetic acid :-

(1) Propanoic acid (2) Formic acid

(3) Butyric acid (4) Iso butyric acid

18. Which of the following acids have the lowest pK_a value :-

(1) $CH_3-\underset{\displaystyle Cl}{\underset{|}{CH}}-COOH$

(2) $Cl-CH_2-CH_2-COOH$

(3) CCl_3COOH

(4) $CHCl_2COOH$

19. In which σ bond, the inductive effect is minimum ?

$\underset{(d)}{C}-\underset{(c)}{C}-\underset{(b)}{C}-\underset{(a)}{C}-Cl$

(1) a (2) b (3) c (4) d

20. Arrange the following in the acidic strength order :

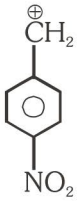
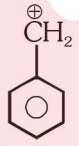
(a) NO_2CH_2COOH (b) $NC-CH_2COOH$

(c) CCl_3COOH (d) $CHCl_2COOH$

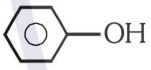
(1) a > b > c > d (2) c > d > a > b

(3) b > a > d > c (4) c > a > b > d

21. Most stable carbocation is :-

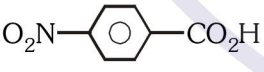
(1)  (2)  (3)  (4) 

22. Most acidic compound is :-

(1) 

(2) 

(3) 

(4) 

23. Which resonating structure of vinyl chloride is least stable :-

(1) $CH_2=CH-\ddot{\underset{\cdot\cdot}{Cl}}:$

(2) $\overset{\ominus}{C}H_2-CH=\overset{\oplus}{Cl}$

(3) $\overset{\ominus}{C}H_2-\overset{\oplus}{C}H-Cl$

(4) All have equal stability

24. The stabilization due to resonance is maximum in

(1)  (2)  (3)  (4) 

25. In which of the following compounds carbon–chlorine bond distance is minimum :-

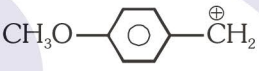
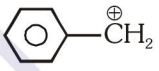
(1) CH_3-Cl

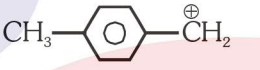
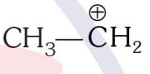
(2) $C_6H_5-CH_2-Cl$

(3) $CH_2=CH-Cl$

(4) $CH_2=CH-CH_2-Cl$

26. Consider the following carbocations

(a)  (b) 

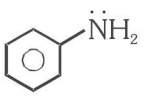
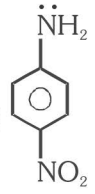
(c)  (d) 

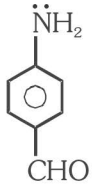
The relative stabilities of these carbocations are such that :-

(1) d < b < c < a (2) b < d < c < a

(3) d < b < a < c (4) b < d < a < c

27. Arrange in decreasing order of basic strength :

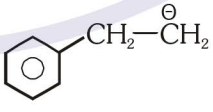
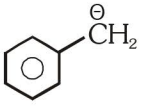
(I)  (II) 

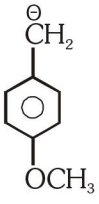
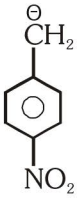
(III)  (IV) 

(1) I > II > III > IV (2) II > III > I > IV

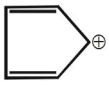
(3) IV > I > III > II (4) IV > I > II > III

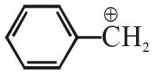
28. The most stable carbanion among the following is

(1)  (2) 

(3)  (4) 

29. Which of the following is most stable carbocation:-

(1)  (2) 

(3)  (4) $CH_2=CH-\overset{\oplus}{C}H_2$

30. The oxygen atom in phenol –

(1) exhibits only inductive effect

(2) exhibits only resonance effect

(3) has more dominating resonance effect than inductive effect

(4) has more dominating inductive effect than resonance effect

31. Which is incorrect stability order :-

(1) $CH_2 = CH - \overset{\oplus}{C}H_2 \; > \; CH_3 - \overset{\oplus}{C}H - CH_3$

(2) $CH_2 = \overset{\oplus}{C}H \; < \; CH_3 - \overset{\oplus}{C}H_2$

(3) $CH_3 - CH_2 - \overset{\ominus}{C}H_2 \; > \; CH_3 - \overset{\ominus}{C}H - CH_3$

(4) $CH_3 - \overset{\oplus}{C}H_2 \; > \; CH_3O - \overset{\oplus}{C}H_2$

32. Mesomeric effect is due to :-

(1) Delocalization of σ e$\bar{s}$

(2) Delocalization of π e$\bar{s}$

(3) Migration of H – atom

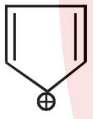
(4) Migration of proton

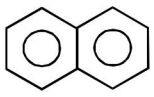
33. Among the following the pKa is minimum for :–

(1) C_6H_5OH (2) HCOOH

(3) C_2H_5OH (4) $CH_3C\equiv CH$

34. Among the following the aromatic compound is –

(1)  (2) 

(3)  (4) 

35. Which is aromatic compound among the following

(1)  (2) 

(3)  (4) All the above

36. Select the correct option for stability of following carbanions :

$\overset{\ominus}{C}H_3$; $C_6H_5\overset{\ominus}{C}H_2$; $CH_3-\overset{\ominus}{\underset{CH_3}{\overset{CH_3}{C}}}$

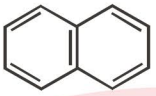
(I) (II) (III)

(1) I > II > III (2) II > I > III

(3) III > II > I (4) II > III > I

37. The non aromatic compound among the following is :-

(1)  (2) 

(3)  (4) 

38. The correct order of acidic strength of the following compounds is :-

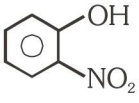
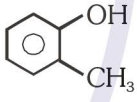
A. Acetylene B. Ammonia

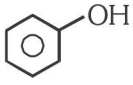
C. Phenol D. Carbonic acid

(1) C > B > A > D (2) D > C > A > B

(3) B > D > A > C (4) A > B > D > C

39. Which one of the following compounds is most acidic:-

(1)  (2) 

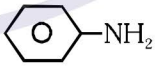
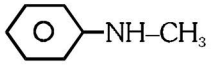
(3)  (4) $ClCH_2CH_2OH$

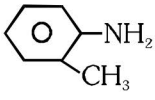
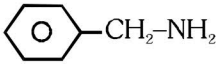
40. Which of the following is most acidic :-

(1) phenol (2) benzyl alcohol

(3) m-chloro phenol (4) cyclohexanol

41. Which of the following is the strongest base :-

(1)  (2) 

(3)  (4) 

42. The least carbon-chlorine bond length present in –

(1) Methyl chloride (2) Allyl chloride

(3) Ethyl chloride (4) Vinyl chloride

43. Which one of the following resonating structures of 1–methoxy–1,3–butadiene is least stable :–

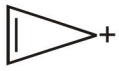
(1) $\overset{\ominus}{C}H_2–CH=CH–CH=\overset{\oplus}{O}–CH_3$

(2) $CH_2=CH–\overset{\ominus}{C}H–CH=\overset{\oplus}{O}–CH_3$

(3) $\overset{\ominus}{C}H_2–\overset{\oplus}{C}H–CH=CH–O–CH_3$

(4) $CH_2=CH–CH=CH–O–CH_3$

44. Four structures are given in options (a) to (d). Examine them and select the aromatic strucutures.

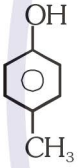
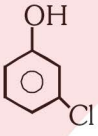
(a)  (b) 

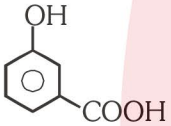
(c)  (d) 

(1) a and d (2) b and c

(3) a and b (4) a and c

45. Order of acidic strength of the following compound will be :

(A)  (B) 

(C)  (D) 

(1) C > D > B > A (2) D > C > B > A

(3) A > B > C > D (4) B > A > C > D

46. Phenol is less acidic than

(1) Ethanol (2) o-Nitrophenol

(3) o-Methylphenol (4) o-Methoxyphenol

47. Temporary electron displacement effect in a molecule that occurs when a reagent approaches to attack if, is called as -

(1) Inductive effect (2) Resonance effect

(3) Mesomeric effect (4) Polarisability effect

48. Which statement is incorrect.

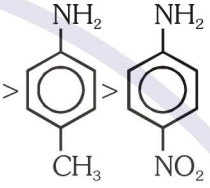
(1) the energy of actual structure of the molecule is lower than that of any canonical structure

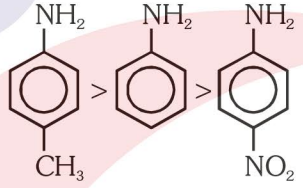
(2) The energy difference between actual structure and least energy resonance structure is called as resonance energy

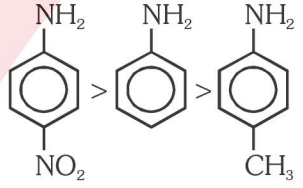
(3) More number of resonating structure, more resonance

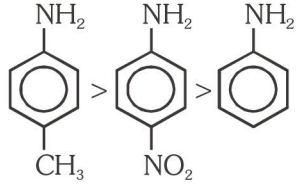
(4) In equivalent resonance structure of acetate ion of C=O bond length are unequal

49. Increasing order of basic strength is :-

(1) $Ph–NH_2$ > 

(2) 

(3) 

(4) 

50. Phenol are ortho para directing due to :

(1) —OH groups shows +M & –I

(2) —OH does not show hinderance

(3) The resonance effect increases the e^- density at o & p position

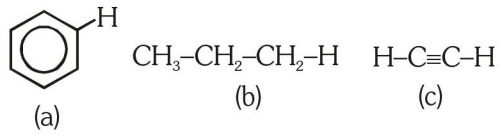
(4) The I-effect decreases the e^- density at meta position

51. Which of the following is not aromatic ?

(1)  (2) 

(3)  (4) 

52. Arrange the following in their acidic strength order



(a) (b) (c)

(1) a > b > c (2) c > a > b
(3) b > a > c (4) a > c > b

53. Which of the following compounds exhibits hyperconjugation :

(1) Phenol (2) Ethyne
(3) Ethanol (4) Propene

54. Which of the following is least stable :–

(1) $CH_3-\overset{\oplus}{C}H-CH_3$ (2) $CH_3-CH_2-\overset{\oplus}{C}H_2$

(3) $CH_3-\underset{CH_3}{\overset{\oplus}{C}}-CH_3$ (4) $CH_3-\underset{CH_3}{\overset{CH_3}{\overset{|}{C}}}-\overset{\oplus}{C}H-C_6H_5$

55. Which of the following is most stable alkene :-

(1) $H_2C=CH_2$

(2) $CH_3-CH=CH_2$

(3) $H_5C_2-CH=CH_2$

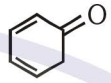
(4) $(CH_3)_2CH-CH=CH_2$

56. Which of the following will lead to maximum enolisation :–

(1) $CH_3-\overset{O}{\overset{\|}{C}}-CH_3$

(2) $CH_3-\underset{O}{\overset{O}{\overset{\|}{C}}}-CH_2-\underset{O}{\overset{O}{\overset{\|}{C}}}-H$

(3) $CH_3-\underset{O}{\overset{O}{\overset{\|}{C}}}-\underset{Br}{CH}-\underset{O}{\overset{O}{\overset{\|}{C}}}-CH_3$

(4) 

57. Urea $\left[H_2N-\underset{O}{\overset{O}{\overset{\|}{C}}}-NH_2\right]$ molecule exhibits (isomerism):-

(1) Chain (2) Position
(3) Geometrical (4) Tautomerism

58. Tautomerism is not observed in :–

(1) $CH_3-\underset{O}{\overset{O}{\overset{\|}{C}}}-CH_3$ (2) Ph–CH=CH–OH

(3) CH_3-NO_2 (4) $CH_3-\underset{CH_3}{\overset{CH_3}{\overset{|}{C}}}-CHO$

ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	**2**	**3**	**2**	**3**	**3**	**2**	**3**	**1**	**1**	**2**	**4**	**3**	**4**	**3**	**2**
Que.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Ans.	**1**	**2**	**3**	**4**	**2**	**3**	**4**	**3**	**4**	**3**	**1**	**3**	**4**	**1**	**3**
Que.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Ans.	**4**	**2**	**2**	**3**	**4**	**2**	**1**	**2**	**1**	**3**	**4**	**4**	**3**	**4**	**1**
Que.	46	47	48	49	50	51	52	53	54	55	56	57	58		
Ans.	**2**	**4**	**4**	**2**	**3**	**4**	**2**	**4**	**2**	**2**	**4**	**4**	**4**		