SRIGAYATRI EDUCATIONAL INSTITUTIONS

INDIA

SR MPC | **DPP TEST-29** | **Time: 3:00 Hrs.**

Date: 17-05-2020 | **Max. Marks: 80 M**

MATHS-A

SYLLABUS: - Statistics

1. **The mean of 20 observation is 15. On checking it was found that two observations were wrongly copied as 3 and 6. If wrong observations are replaced by correct values 8 and 4, then the correct mean is**

1) 15 2) 15.15 3) 16.15 4) 17

2. **The mean weight of a items is 15. If one more item is added to the series the mean becomes 16. The value of 10^{th} item is**

1) 35 2) 30 3) 25 4) 20

3. **When 15 was subtracted from each of the seven observations of the following number resulted:** $-3,0,-2,4,6,1,1$. **The mean of the distribution is**

1) 14 2) 15 3) 16 4) 17

4. **If the arithmetic and harmonic means of two numbers are 4.5 and 4 respectively, then one of the number is**

1) 5 2) 6 3) 7 4) 4

5. **If the mode of a data is 18 and the mean is 24, then median is**

1) 18 2) 24 3) 21 4) 22

6. **Mode of the distribution**

Marks	**4**	**5**	**6**	**7**	**8**
No.of Students	**3**	**5**	**10**	**6**	**1**

1) 6 2) 10 3) 8 4) 4

7. **The standard deviation of 0,1,2,3…9 is K then the standard deviation of 10,11,12,13…19 is**

1) $K+10$ 2) K 3) $\sqrt{10}+K$ 4) 10K

8. **The mean of four observations is 3. If the sum of the squares of those observations is 48 then their standard deviation is**

1) $\sqrt{2}$ 2) $\sqrt{3}$ 3) $\sqrt{5}$ 4) $\sqrt{7}$

9. **If** $X_1, X_2, ...X_n$ **are n observations such that** $\sum_{i=1}^{n} x_i^2 = 400$ **and** $\sum_{i=1}^{n} x_i = 80$ **then the least value of n is**

1) 12 2) 15 3) 16 4) 18

10. **The A.m of the observations 1.3.5, 3.5.7, 5.7.9,….** $(2n-1)(2n+1)(2n+3)$ **is** $(\forall n \in N)$

1) $2n^3+6n^2+7n-2$ 2) n^3+8n^2+7n-2 3) $2n^3+5n^2+6n-1$ 4) $2n^3+8n^2+7n-2$

11. **The average marks of boys in a class is 52 and that of girls is 42. The average marks of boys and girls combined is 50. The percentage of boys in the class is**

1) 60 2) 40 3) 20 4) 80

12. **Mean of 'n' items is** $\bar{x}$. **If these n items are successively increased by** $2, 2^2, 2^3, ...2^n$. **Then the new mean is**

1) $\bar{x}+\frac{2^{n+1}}{n}$ 2) $\bar{x}+\frac{2^{n+1}}{n}-\frac{2}{n}$ 3) $\bar{x}+\frac{2^n}{n}$ 4) $\bar{x}+2^n$

13. **Product of n positive numbers is unity. The sum of these numbers cannot be less than**

1) 1 2) n 3) n^2 4) 2

14. If A.m = 24.5, G.m = 24.375 , then H.m =

1) 24 2) 24.125 3) 24.5 4) 24.25

15. If in a frequency distribution, the mean and median are 21 and 22 respectively, then its mode is approximately

1) 20.5 2) 22.0 3) 24.0 4) 25.5

16. The mean and S.D of 1,2,3,4,5,6 is

1) 3,3 2) $\frac{7}{2},\sqrt{\frac{35}{12}}$ 3) $\frac{7}{2},\sqrt{3}$ 4) $\frac{35}{12}$

17. The variance of first 10 multiples of 3 is

1) 34.25 2) 54.25 3) 70.25 4) 74.25

18. The variance of first 50 even natural numbers is

1) $\frac{833}{4}$ 2) 833 3) 437 4) $\frac{437}{4}$

19. The mean of the five observations is 5 and their variance is 124, if three of the observations are 1,2 and 6 then mean deviation from the mean of the data

1) 2.4 2) 2.8 3) 2.5 4) 2.6

20. If the S.D of the numbers 2, 3, a and 11 is 3.5 then which of the following is true

1) $3a^2-23a+44=0$ 2) $3a^2-26a+55=0$ 3) $3a^2-32a+84=0$ 4) $3a^2-34a+91=0$

MATHS-B

Syllabus: Definite Integration as limt of sum

21. $\lim_{n\to\infty}\sum_{r=5}^{5n+5}\frac{n^2}{\left(n^2+r^2\right)}=$ ____

1) $\frac{1}{\sqrt{2}}$ 2) $\frac{1}{3}\log 2$

3) $\frac{\pi}{4}$ 4) $\frac{5}{\sqrt{26}}$

22. By definition of the definite integral the value of

$$\lim_{n\to\infty}\left[\frac{1^2}{1^3+n^3}+\frac{2^2}{2^3+n^3}+-----+\frac{1}{2n}\right]=$$ ____

1) $\sqrt[4]{\log 2}$ 2) $\log\sqrt[3]{2}$ 3) $\sqrt{\log 2}$ 4) $\log\sqrt[2]{3}$

23. $\lim_{n\to\infty}\frac{1}{n}\sum_{r=1}^{2n}\frac{r}{\sqrt{n^2+r^2}}=$ ____

1) $1+\sqrt{5}$ 2) $-1+\sqrt{5}$ 3) $-1+\sqrt{2}$ 4) $1+\sqrt{2}$

24. $\lim_{n\to\infty}\frac{1}{n}\left\{\sin^5\left(\frac{\pi}{6n}\right)+\sin^5\left(\frac{2\pi}{6n}\right)+\sin^5\left(\frac{3\pi}{6n}\right)+-----+\sin^5\left(\frac{\pi}{2}\right)\right\}=$ ____

1) $\frac{8}{15\pi}$ 2) $\frac{8}{5\pi}$ 3) $\frac{32}{5\pi}$ 4) $\frac{16}{5\pi}$

25. $\lim_{n\to\infty}\left[\frac{\sqrt{1}+2\sqrt{2}+3\sqrt{3}+-------+n\sqrt{n}}{n^{5/2}}\right]=$ _____

1) 1 2) $\frac{5}{2}$ 3) 0 4) $\frac{2}{5}$

26. By definition of the definite integral the value of

$$\lim_{n\to\infty}\left[\frac{1^4}{1^5+n^5}+\frac{2^4}{2^5+n^5}+\frac{3^4}{3^5+n^5}+\text{-----}+\frac{n^4}{n^5+n^5}\right] is$$

1) $\frac{1}{5}\log 2$ 2) $\frac{1}{4}\log 2$ 3) $\frac{1}{3}\log 2$ 4) $\log 2$

27. $\lim_{n\to\infty}\sum_{r=1}^{n}\frac{4r^3}{r^4+n^4}=p$ then $e^p=$ ____

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

28. $\lim_{n\to\infty}\left[\frac{n}{n^2+1^2}+\frac{n}{n^2+2^2}+\frac{n}{n^2+3^2}+\text{-------}+\frac{1}{5n}\right]$ is equal to

A) $\tan^{-1(3)}$ B) $\tan^{-1(2)}$

C) $\frac{\pi}{2}$ D) $\frac{\pi}{4}$

29. $\lim_{n\to\infty}\sum_{r=1}^{n}\frac{1}{n}\left[\sqrt{\frac{n+r}{n-r}}\right]=$ __

1) $\frac{\pi}{2}$ 2) 2π

3) $\frac{\pi}{2}$ -1 4) $\frac{\pi}{2}$ +1

30. $\lim_{n\to\infty}\left[\frac{1}{3n+1}+\frac{1}{3n+2}+\text{-------}+\frac{1}{3n+n}\right]=$ ___

1) $\log\left(4/3\right)$

2) $\log\left(3/2\right)$

3) $\log\left(2/3\right)$

4) $\log\left(3/4\right)$

31. $\lim_{n\to\infty}\left[\frac{n+1}{n^2+1^2}+\frac{n+2}{n^2+2^2}+\text{-------}+\frac{n+n}{n^2+n^2}\right]=$ ___

1) $\frac{\pi}{4}+\frac{1}{2}\log 2$ 2) $\frac{\pi}{4}-\frac{1}{2}\log 2$

3) $\frac{\pi}{2}+\frac{1}{2}\log 2$ 4) $\frac{\pi}{2}-\frac{1}{2}\log 2$

32. $\lim_{n\to\infty}\left[\frac{1}{n}+\frac{n^2}{(n+1)^3}+\frac{n^2}{(n+2)^3}\text{-------}+\frac{1}{8n}\right]=$ ___

1) $\frac{2}{5}$ 2) $\frac{3}{5}$

3) $\frac{3}{8}$ 4) $\frac{11}{7}$

33. $\lim_{n\to\infty}\left\{\frac{1}{\sqrt{n^2+1^2}}+\frac{1}{\sqrt{n^2+2^2}}+-------+\frac{1}{\sqrt{n^2+n^2}}\right\}=$ ___

1) $\log\sqrt{2}+2$ 2) $\log\sqrt{2}-2$ 3) $\log\sqrt{2}+1$ 4) $\log\sqrt{2}-1$

34. $\lim_{n\to\infty}\left[\frac{n^{1/2}}{n^{3/2}}+\frac{n^{1/2}}{(n+3)^{3/2}}+\frac{n^{1/2}}{(n+6)^{3/2}}-------+\frac{n^{1/2}}{(n+3(n-1))^{3/2}}\right]=$ ___

1) $\frac{1}{3}$ 2) $\frac{1}{5}$ 3) $\frac{1}{10}$ 4) $\frac{1}{2}$

35. $\lim_{n\to\infty}\left\{\left(1+\frac{1}{n}\right)+\left(1+\frac{2}{n}\right)+-------+\left(1+\frac{n}{n}\right)\right\}^{1/n}=$ ___

1) e 2) $\frac{1}{e}$ 3) $\frac{4}{e}$ 4) $\frac{8}{e}$

36. $\lim_{n\to\infty}\left\{\left(1+\frac{1^2}{n^2}\right)+\left(1+\frac{2^2}{n^2}\right)+-------+\left(1+\frac{n^2}{n^2}\right)\right\}^{1/n}=$ ___

1) $e^{\frac{\pi-4}{2}}$ 2) $2e^{\frac{\pi-4}{2}}$ 3) $\frac{e^{\frac{\pi-4}{2}}}{2}$ 4) $e^{\pi-4}$

37. If $f(n)=\frac{1}{n}\left[(n+1)(n+2)(n+3)-----(2n)\right]^{\frac{1}{n}}$ then $\lim_{n\to\infty}f(n)=$ ___

1) $\frac{4}{e}$ 2) $\log\left(\frac{4}{e}\right)$ 3) $\frac{2}{e}$ 4) $\log\left(\frac{2}{e}\right)$

38. If $I_{n=}\int_0^{\frac{\pi}{4}}\tan^n x d_n$ then $\lim_{n\to\infty}n\left(I_n+I_{n-2}\right)=$ _____

1) 1/2 2) 1 3) α 4) 0

39. $\lim_{n\to\infty}\left(\frac{(n+1)(n+2)-----3n}{n^{2n}}\right)^{\frac{1}{n}}$ is equals to

1) $\frac{18}{e^4}$ **2)** $\frac{27}{e^2}$ **3)** $\frac{9}{e^2}$ **4)** 3log3-2

40. $\lim_{n\to\infty}n\left(\frac{1}{3n^2+8n+4}+\frac{1}{3n^2+16n+16}+-----+\frac{1}{15n^2}\right)=$ ___

1) $\frac{1}{2}\log\left(\frac{9}{5}\right)$ **2)** $\frac{1}{4}\log\left(\frac{9}{5}\right)$ **3)** $2\log\left(\frac{9}{5}\right)$ **4)** $\frac{1}{4}\log\left(\frac{5}{9}\right)$

PHYSICS

SYLLABUS :- Waves

41. **A capacitance $\left(\frac{10^{-3}}{2\pi}\right)F$ and an inductance of $\left(\frac{100}{\pi}\right)nH$ and a resistance of 10Ω are Connected in series with on Ac voltage source of 220V, 50 Hz. The phase angle of the circuit is**
1) 60^0 2) 30^0 3) 45^0 4) 90^0

42. **The number of turns in primary and secondary coils of a transformer is 50 and 200. If the current in the primary coil is 4A, then the current in the secondary coil is**
1) 1A 2) 2A 3) 4A 4) 5A

43. **In an apparatus, the electric field was found to oscillate with amplitude of 18 V/m. The amplitude of the oscillating magnetic field will be**
1) $4\times10^{-6}T$ 2) $6\times10^{-8}T$ 3) $9\times10^{-9}T$ 4) $11\times10^{-11}T$

44. **Light with an energy flux of 9w cm^2 falls on a non-reflecting surface a normal incidence. If the surface has an area of $20cm^2$. The total momentum delivered for complete absorption in one hour is**
1) $2.16\times10^{-4}kgms^{-1}$ 2) $1.16\times10^{-3}kgms^{-1}$ 3) $2.16\times10^{-3}kgms^{-1}$ 4) $3.16\times10^{-4}kgms^{-1}$

45. **If a transmitting antenna of height 105m is placed on a hill, then its coverage area is**
1) 4224 kg^2 2) 3264 km^2 3) 6400 km^2 4) 4864 km^2

46. **The maximum applitude of an amplitude modulated wave is 16v, while the minimum amplitude is 4v. The modulation index is**
1) 0.4 2) 0.5 3) 0.6 4) 4

47. **Initially a photon of wavelength λ, falls on photocathode and emits and electron of maximum energy E. If the wavelength of the incident photon is charged to λ_2, the maximum energy of the electron emitted becomes E_2. Then value of hc (h=plancks constant, c = velocity of light) is**
1) $\left(C_5H_5CH_2\right)_2C$ 2) $hc=\frac{\left(E_1-E_2\right)\lambda_1\lambda_2}{\lambda_2-\lambda_1}$
3) $hc=\frac{\left(E_1-E_2\right)\left(\lambda_2-\lambda_1\right)}{\lambda_1\lambda_2}$ 4) $hc=\frac{\left(\lambda_2-\lambda_1\right)}{\lambda_1\lambda_2}\left(\frac{E_1}{E_2}\right)$

48. **A charged particle is accelerated from rest through a certain potential difference. The de-Broglie wave length is λ_1 when it is accelerated through V_1 and is λ_2 when is accelerated through V_2. The ratio λ_1/λ_2 is**
1) $V_1^{3/2}:V_2^{3/2}$ 2) $V_2^{1/2}:V_1^{1/2}$ 3) $V_1^{1/2}:V_2^{1/2}$ 4) $V_1^2:V_2^2$

49. **The work function of a metal is 2eV. If a radiation of wavelength 3000 $\overset{0}{A}$ is incident on it, the maximum Kinetic energy of the emitted photo electrons is**
(Planck's constant $h=6.6\times10^{-34}Js$),
Velocity of light $c=3\times10^8m/s$,
$1eV=1.6\times10^{-19}J$
1) $4.4\times10^{-19}J$ 2) $5.6\times10^{-19}J$ 3) $3.4\times10^{-19}J$ 4) $2.5\times10^{-19}J$

50. **If the first line of Lyman series has a wavelength 1215.4 A^0. The first line of Balmer series is approximately.**
1) 4684 A^0 2) 1025.5 A^0 3) 6563 A^0 4) 6400 A^0

51. **The values of potential energy, kinetic energy and the total energy of the electron in the fourth orbit of hydrogen atom are respectively.**
1) $-1.7eV,-1.7eV,-3.4eV.$ 2) $+1.7eV,+1.7eV,-3.4eV.$
3) $-1.7eV,+0.85eV,-0.85eV.$ 4) $-1.7eV,+1.7eV,0eV$

52. **If the wavelength of light that is emitted from hydrogen atom when an electron falls from orbit $n=2$ to orbit $n=1$ is 122nm, then minimum wavelength of the series is**

1) 405 A^0 2) 9150 A^0 3) 812 A^0 4) 915 A^0

53. **A certain radioactive element disintegrates with a decay constant of 7.9×10^{-10} / sec. At a given instant of time, if the activity of the sample is equal to 55.3×10^{11} disintegration/sec, then number of nuclei at that instant of time is**

1) 7.0×10^{21} 2) 4.27×10^{13} 3) 4.27×10^{3} 4) 6×10^{23}

54. **A U^{235} reactor generates power at a rate of 'p' producing 2×10^{18} fissions per second. The energy released per fission is 182 meV. The value of p is**

1) 0.59 mega watts 2) 370 mega watts 3) 59.2 mega watts 4) 370×10^{8} mega watts

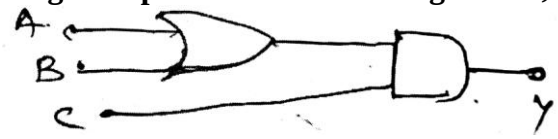
55. **If the radius of a nucleus with mass number 125 is 1.5 fermi, then radius of nucleus with mass number 64 is**

1) 1.92 fermi 2) 1.2 fermi 3) 0.48 fermi 4) 0.96 fermi

56. **A certain particle has a half life of 60 seconds. The fraction of the particles that will decay at the end of 10 seconds is**

1) $2^{1/6}$ 2) $\left(1-2^{-1/6}\right)$ 3) $\left(2^{6}-1\right)$ 4) $\left(1-2^{1/6}\right)$

57. **To get output 1 for the following circuit, the correct choice for the input is**



1) $A=0,\ B=1,\ C=0$ 2) $A=1,\ B=0,\ C=0$ 3) $A=1,\ B=1,\ C=0$ 4) $A=1,\ B=0,\ C=1$

58. **The change in current through a junction diode is 1.2 mA when forward bias voltage is changed by 0.6V. The dynamic resistance is**

1) 500 Ω 2) 300 Ω 3) 150 Ω 4) 250 Ω

59. **In a half wave rectifier the Ac input source of frequency 50Hz is used. The fundamental frequency of the output is**

1) 50Hz 2) 150Hz 3) 200Hz 4) 75Hz

60. **For a common-emitter transistor amplifier, the current gain is 60. If the emitter current is 6.6 mA then its base current is**

1) 6.492 A) 0.108 A 3) 4.208 A 4) 0.343 A

CHEMISTRY

SYLLABUS:- Preparation of aldehydes and ketones.

61. **Vinyl alcohol gets converted into acetaldehyde by**

1) oxidation 2) reduction 3) rearrangement 4) polymerisation

62. $CH_3COCl+H_2\xrightarrow[Catalyst]{Lindlar's}CH_3CHO+HCl$ **. The above reaction is known as**

1) Aldol condensation 2) Clementon's reduction
3) Rosenmund's reduction 4) Carbylamines reaction

63. **The alkene which on ozonalysis gives acetaldehyde and acetone is**

1) $CH_3-CH=\underset{\displaystyle CH_3}{\overset{\displaystyle |}{C}}-CH_3$ 2) $CH_3-CH=CH-CH_2-CH_3$

3) $CH_2=CH-CH_3$ 4) $(CH_3)_2C=C(CH_3)_2$

64. **Grignard reagent do not give carbonyl compounds with**

1) CO_2 2) $RCOCl$ 3) RCN 4) $RCOOR$

65. **When propyne is subjected to hydroboration reaction, it is converted to**

1) propanol 2) acetone 3) propanal 4) butanone

66. Which of the following on heating with $aq.koH$ produces butanaldehyde

1) $CH_3CH_2CH_2CH_2Cl$ 2) $CCl_3CH_2CH_2CH_3$

3) $CH_3CH_2CH_2CHCl_2$ 4) $CH_3CCl_2CH_2CH_3$

67. Two Isomeric compounds 'A' and 'B' have the formula $C_3H_6Cl_2$, with $aqkoH$ solution 'A' gives proponaldehyde and 'B' gives acetone. Then 'A' and 'B' are

1) $CH_3-CCl_2-CH_3$ *and* $CH_3-CH_2-CHCl_2$

2) $CH_3-CHCl-CHCl_2$ *and* $CH_3-CH_2-CHCl_2$

3) $CH_3-CH_2-CHCl_2$ *and* $CH_3-CCl_2-CH_3$

4) $CH_3-CHCl-CHCl_2$ *and* $CH_3-CCl_2-CH_3$

68. Identify A in the following
Figure

1) cyclo hexane 2) methyl cyclohexane

3) cyclo hexane carbaldehyde 4) methyl cyclo hexane carbaldehyde

69. Figure

1) acetyl chloride 2) ethyl chloride 3) vinyl chloride 4) methyl chloride

70. Figure
Name of above reaction is

1) wurtz reaction 2) clemmenson reduction

3) wolf kishner reduction 4) friedel-craft's alkylation

71. Figure

1) H_2CO_3 2) C_2O_3 3) C_3O_2 4) CO

72. Which of the following on hydrolysis with dilute alkali followed by acidification gives benzaldehyde.

1) benzotrichloride 2) benzalchloride 3) benzyl chloride 4) p-chloro toluene

73. $X+CH_3MgBr \xrightarrow{H_2O} CH_3-CO-CH_3+NH_3+MgbR(OH)$ **Identify X**

1) ethyl cyanide 2) ethyl chloride 3) ethane nitride 4) methane nitrite

74. Methyl cynide reacts with ethyl magnesium bromide and forms and addition compound which on hydrolysis forms a compounds (A). The functional Isomers of (A) is

1) butanone 2) propanone 3) butanal 4) propanal

75. Propanoyl chloride on reduction with Lindlar's catalyst forms a compound (A) product (A) is

1) propanone 2) propanoic acid 3) propanol 4) propanal

76. For the following conversion which reagent is used

$CH_2=CH-CH_2OH \xrightarrow{?} CH_2=CH-CHO$

1) $O_3 \mid H_3O^+$ 2) PCC 3) $HgSO_4 \mid H^+$ 4) Lucas reagent

77. Which of the following is not a monovalent functional group.

1) aldehydic 2) ketonic 3) carbonylic 4) hydroxy

78. Stephens reaction is used in the preparation of

1) carboxylic acids 2) ketones

3) alcohols 4) aldehydes

79. The solvent used in Etard's reaction during the formation of benzaldehyde from tolvene is

1) acetic acid 2) water 3) $Liq.NH_3$ 4) CS_2

80. Ethyl alcohol $\xrightarrow[300^0C]{Cu} A+B$ **what are A and B**

1) acetaldehyde, acetone 2) acetone, water

3) acetaldehyde, H_2 4) acetone, H_2

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