VIGNAN UNIVERSITY

Vadlamudi, Guntur Dist.-522 213

Model paper

This booklet contains 24 printed pages

PAPER -1: MATHEMATICS, PHYSICS, CHEMISTRY, ENGLISH & APTITUDE

Read carefully the following Instructions before opening the seal of this booklet.

Do not open this Test Booklet untill you are instructed by the invigilator.

B O O K L E T

CODE **D**

SERIAL NO.

Important Instructions:

1. Immediately fill in the particulars at the bottom of this test booklet with blue/black ball point pen. Use of pencil is strictly prohibited.
2. A separate OMR Answer Sheet is provided along with this test booklet. When you are directed to open the test booklet, take the OMR Answer Sheet and fill in the required particulars carefully.
3. The CODE for this booklet is D. Make sure that the CODE on the OMR Answer Sheet should be marked as that on this booklet.
4. Immediately on opening the booklet, please check for (i) The same booklet code (A/B/C/D) on the top of each page (ii) serial number of the questions (1-120) (iii) The number of pages (iv) correct printing.
5. The test is of 3 hours duration.
6. The test consists of 120 Questions. The maximum marks are 120.
7. There are 4 sections in the question paper. Each question carries 1 mark for correct answer and there is no negative marking for incorrect answer.
   Section I - MATHEMATICS (30 Marks) consists of 30 questions (1 to 30).
   Section II - PHYSICS (30 Marks) consists of 30 questions (31 to 60).
   Section III - CHEMISTRY (30 Marks) consists of 30 questions (61 to 90).
   Section IV - ENGLISH & APTITUDE (30 Marks) consists of 30 questions (91 to 120).
8. Candidates will be awarded marks as stated in instruction No.6 for correct response to each question. Marks will not be awared for unattempted / unmarked questions on the answer sheet.
9. No candidate is allowed to carry any textual material,printed or written, bits of papers, blank papers, mobile phone, any electronic device, etc., except the hall ticket, ball point pen, HB pencil, eraser and sharpner inside the examination hall/room.
10. Rough work is to be done in the space provided at the bottom of each page, on pages 2 and 21 to 24 in the test booklet only.
11. On completion of the test, the candidate must hand over the test booklet along with OMR Answer Sheet to the Invigilator in the room/hall.
12. Do not fold, mutilate or make any stray marks on the OMR Answer Sheet.

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SPACE FOR ROUGH WORK

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Section - I

MATHEMATICS

1. $\bar{r}$ is a unit vector satisfying $\bar{r}\times\bar{a}=\bar{b}$, $|\bar{a}|=\sqrt{3}$, $|\bar{b}|=\sqrt{2}$. Then $\bar{r}$ is

A) $\frac{1}{3}\left((\pm\bar{a})-(\bar{b}\times\bar{a})\right)$ B) $\frac{1}{3}(\bar{a}+\bar{b}\times\bar{a})$

C) $\frac{1}{3}\left((\pm\bar{a})-2(\bar{b}\times\bar{a})\right)$ D) $\frac{1}{3}(\bar{a}-2(\bar{a}\times\bar{b}))$

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2. A particle moves in a straightline with a velocity given by $\frac{dx}{dt}$ = x + 1 (x is the distance travelled). The time taken by a particle to traverse a distance of 99 meters is

A) $\log_{10} e$ B) $2\log_{e} 10$ C) $2\log_{10} e$ D) $\frac{1}{2}\log_{10} e$

---

3. Let f: $A\to B$ be a function defined by f(x) = Sinx + $\sqrt{3}$ Cosx+4 if f is invertible then

A) $A=\left[\frac{-5p}{6}\ \frac{p}{6}\right]\ B=[2\ \ 6]$ B) $A=\left[\frac{-2p}{3}\ \frac{p}{3}\right]\ B=[2\ \ 6]$

C) $A=\left[\frac{-p}{2}\ \frac{p}{2}\right]\ B=[-1\ \ 1]$ D) $A=\left[\frac{-p}{2}\ \frac{p}{2}\right]\ B=[2\ \ 6]$

---

4. $\sum_{k=0}^{11}(-1)^k\,11_{C_k}\left(\frac{1}{2^k}+\frac{3^k}{2^{2k}}\right)$

A) $\frac{2^{11}-1}{2^{22}}$ B) $\frac{2^{22}-1}{2^{22}}$ C) $\frac{2^{11}+1}{2^{22}}$ D) $\frac{2^{11}-1}{2^{11}}$

---

5. The direct common tangents to the circles $x^2+y^2+2x=0$, $x^2+y^2-6x=0$ are

A) $y=\pm\sqrt{3}(x+3)$ B) $y=\pm\sqrt{3}(x-3)$ C) $y=\pm\frac{1}{\sqrt{3}}(x+3)$ D) $y=\pm\frac{1}{\sqrt{3}}(x-3)$

Rough Work

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6. If f: R $\to$ R defined by $f(x) = \begin{cases} \frac{1-\cos^4 x}{x^2} & x \neq 0 \\ a & x = 0 \end{cases}$ is continuous at x = 0 then a =

A) 1 B) 2 C) 3 D) 4

---

7. If the system of equations 2x - 3y + 4z = 0, 5x - 2y -z = 0, 21x - 8y + az = 0 has infinite solutions, then a =

A) -5 B) - 4 C) 2 D) 4

---

8. The most general value of q satisfying the equation $(1+2\text{Sin}q)^2 + \left(\sqrt{3}\text{Tan}q - 1\right)^2 = 0$ are given by

A) $np + \frac{p}{6}, n \in z$ B) $\frac{np}{2} + (-1)^n \frac{7p}{6}, n \in z$

C) $2np + \frac{7p}{6}, n \in z$ D) $2np + \frac{11p}{4}, n \in z$

---

9. The real and imaginary part of log (1 + i) is

A) $\left(\log\sqrt{2}, \frac{p}{4}\right)$ B) $\left(\frac{1}{2}, \frac{p}{4}\right)$ C) $\left(\log 2, \frac{p}{4}\right)$ D) $\left(\log\frac{1}{2}, \frac{p}{4}\right)$

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10. The range of $13\cos x + 3\sqrt{3}\,Sinx - 4$ is

A) [-18,10] B) (-18,10) C) -18,10 D) [10,18]

---

11. $\int_0^1 x^3 (1-x)^{\frac{3}{2}}\, dx$

A) $\frac{12}{165}$ B) $\frac{32}{165}$ C) $\frac{96}{1155}$ D) $\frac{32}{1155}$

Rough Work

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12. The distance between a point p whose position vector is $5\bar{i}+\bar{j}+3\bar{k}$ and the line $\bar{r}=(3\bar{i}+7\bar{j}+\bar{k})+t(\bar{j}+\bar{k})$ is

A) 3 B) 4 C) 5 D) 6

---

13. If $\bar{a}=a_1\bar{i}+a_2\bar{j}+a_3\bar{k}$, $\bar{b}=b_1\bar{i}+b_2\bar{j}+b_3\bar{k}$ and $\bar{c}=c_1\bar{i}+c_2\bar{j}+c_3\bar{k}$ be three non zero vectors such that $\bar{c}$ is a unit vector perpendicular to both the vectors $\bar{a}$ and $\bar{b}$. If the angle between $\bar{a}$ and $\bar{b}$ is $\frac{p}{6}$ then $\begin{vmatrix} a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \\ c_1 & c_2 & c_3 \end{vmatrix}^2 =$

A) 0 B) 1

C) $\frac{1}{4}(a_1^2+a_2^2+a_3^2)(b_1^2+b_2^2+b_3^2)$ D) $\frac{3}{4}(a_1^2+a_2^2+a_3^2)(b_1^2+b_2^2+b_3^2)(c_1^2+c_2^2+c_3^2)$

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14. If $x=\sum_{n=0}^{\infty}a^n$, $y=\sum_{n=0}^{\infty}b^n$ and $z=\sum_{n=0}^{\infty}c^n$ where a,b,c are in A.P such that $|a|<1$, $|b|<1$, $|c|<1$ then x,y,z are in.

A) A.P B) G.P C) H.P D) A.G.P

---

15. P (q) & Q (f) are two points on the hyperbola $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$ such that $q-f=2a$ then PQ touches the conic

A) $\frac{x^2}{a^2}-\frac{y^2}{b^2}\cos^2 a=1$ B) $\frac{x^2}{a^2}-\frac{y^2}{b^2}=\cos^2 a$

C) $\frac{x^2\cos^2 a}{a^2}-\frac{y^2}{b^2}=1$ D) $\frac{x^2}{b^2}-\frac{y^2}{a^2}=\cos^2 a$

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16. The eccentricity of ellipse $2x^2+3y^2=2012$ is

A) $\frac{1}{\sqrt{2}}$ B) $\frac{1}{\sqrt{3}}$ C) $\frac{1}{2}$ D) $\frac{1}{3}$

Rough Work

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17. Let M be the set of all 2 x 2 matrices with entries from the set R of real numbers. Then the function f: $M \to R$ defined by f(A)= $|A|$ for every A$\in$ M is

A) one - one and onto B) neither one - one nor onto

C) one - one but not onto D) onto but not one - one

18. The value of 'a' for which the function f(x) = a sin x + $\frac{1}{3}$ sin3x has an extremum at x= $\frac{p}{3}$ is

A) 1 B) -1 C) 0 D) 2

19. If $x^2 + x + 1 = 0$, then value of $\left(x+\frac{1}{x}\right)^2+\left(x^2+\frac{1}{x^2}\right)^2+.....\left(x^{18}+\frac{1}{x^{18}}\right)^2$ is

A) 27 B) 72 C) 54 D) 36

20. If A is non singular matrix satisfies $A^2 - A + 2I = 0$, Then A^{-1} =

A) I - A B) $\frac{I-A}{2}$ C) I + A D) $\frac{I+A}{2}$

21. If $a+b=3$ and $a^3+b^3=7$, then a and b are roots of the equation

A) $9x^2 + 27x + 20 = 0$ B) $9x^2 - 27x + 20 = 0$

C) $9x^2 + 27x - 20 = 0$ D) $9x^2 - 27x - 20 = 0$

22. In $\Delta^{le} ABC$, the sides a,b,c are the roots of equation $x^3 - 11x^2 + 38x - 40 = 0$ then $\frac{\cos A}{a}+\frac{\cos B}{b}+\frac{\cos C}{c}$ is equal to

A) 1 B) $\frac{3}{4}$ C) $\frac{9}{16}$ D) 0

23. The area bounded by the curve $y = ax^2$ and $x = ay^2$ is equal to 1 then a =

A) $\frac{1}{\sqrt{3}}$ B) $\frac{1}{2}$ C) 1 D) $\frac{1}{3}$

Rough Work

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24. The solution of the differential equation $(1-x^2)\frac{dy}{dx}+xy=\frac{x^4}{(1+x^5)}\left(\sqrt{1-x^2}\right)^3$ is

$Ay-\sqrt{1-x^2}\ln\left(1+x^5\right)=c\sqrt{1-x^2}$ where A =

A) 4 B) $\frac{1}{4}$ C) 5 D) $\frac{1}{5}$

---

25. In the tetrahedron 0ABC, the median AL of the face ABC is divided at a point M in the ratio AM:ML = 3:7 with respect to the non - coplanar vectors $\bar{a}=\overline{0A},\bar{b}=\overline{0B},\bar{c}=\overline{0C}$ the position vector of M is

A) $\frac{7}{10}\bar{a}+\frac{3}{20}\bar{b}+\frac{3}{20}\bar{c}$ B) $\frac{7\bar{a}+3\bar{b}+3\bar{c}}{20}$

C) $\frac{7}{10}\bar{a}+\frac{\bar{b}}{20}+\frac{\bar{c}}{20}$ D) $\frac{1}{10}\left(7\bar{a}+3\bar{b}+3\bar{c}\right)$

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26. Two finite sets A and B have m,n elements respectively. If the number of subsets of A is 56 more than the number of sub sets of B. then m+n =

A) 6 B) 9 C) 10 D) 15

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27. The probability of choosing randomly a number 'a' from the set {1,2,3---9} such that the quadratic equation $x^2+4x+a=0$ has real roots is

A) $\frac{1}{9}$ B) $\frac{2}{9}$ C) $\frac{4}{9}$ D) $\frac{7}{9}$

---

28. Let f(n) denote the number of different ways in which the positive integer n can be expressed as the sum of 1s & 2s for example f(4) = 5

Since 4 = 2+2 = 2+1+1 = 1+2+1 = 1+1+2 = 1+1+1+1 (order of 1s & 2s is important). The value of f(6) is equal to

A) 12 B) 13 C) 14 D) 18

Rough Work

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29. If $\frac{d}{dx}\left[a\,\mathrm{Tan}^{-1}x + b\log\left(\frac{x-1}{x+1}\right)\right] = \frac{1}{x^4-1}$ then a – 2b =

A) 0 B)1 C) -1 D) 2

---

30. x = sec θ - cos θ y = $\sec^5 q - \cos^5 q$ then $\left(\frac{x^2+4}{y^2+4}\right)\left(\frac{dy}{dx}\right)^2$ =

A) 9 B) 5 C) 16 D) 25

Rough Work

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Section - II
PHYSICS

31. If $\overline{a_1}$ and $\overline{a_2}$ are two non collinear unit vectors and if $\left|\overline{a_1}+\overline{a_2}\right|=\sqrt{3}$, then the value of $\left(\overline{a_1}-\overline{a_2}\right).\left(2\overline{a_1}+\overline{a_2}\right)$ is

A) 2 B) $\frac{3}{2}$ C) $\frac{1}{2}$ D) 1

---

32. A particle of mass m is projected from the ground with initial linear momentum P (magnitude) such that to have maximum possible range. Its minimum kinetic energy will be

A) $\frac{P^2}{2m}$ B) $\frac{P^2}{4m}$ C) $\frac{P^2}{m}$ D) $\frac{P^2}{3m}$

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33. During paddling of a bicycle, the force of friction exerted by the ground on the two wheels is such that it acts

A) in the backward direction on the front wheel and in the farward direction on the rear wheel

B) in the farward direction on the front wheel and in the backward direction on the rear wheel

C) in the backward direction on both the front and the rear wheels

D) in the farward direction on both front and the rear wheels

---

34. A particle is released from a height H. At certain height its kinetic energy is two times its potential energy, height of particle at that instant is

A) $\frac{H}{3}$ B) $\frac{H}{2}$ C) $\frac{H}{4}$ D) $\frac{2H}{3}$

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35. A tennis ball bounces down a flight of stairs striking each step in turn and rebounding to the height of the step above. The coefficient of restitution is

A) $\frac{1}{2}$ B) $\frac{1}{\sqrt{2}}$ C) $\frac{1}{4}$ D) 1

Rough Work

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36. Assertion (A) : Air is more elastic than water

Reason (R): Elasticity is directly proportional to compressibility and air is more compressible than water

A) If both A and R are true and R is a correct explanation of A

B) If both A and R are true but R is not a correct explanation of A

C) If A is true but R is false

D) Both A and R are false

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37. Three capillary tubes of same radius 1cm but of lengths 1m, 2m and 3m are fitted horizontally to the bottom of a long cylinder containing a liquid at constant pressure and flowing through these tubes. What is the length of a single tube which can replace the three capillaries.

A) $\frac{6}{11}m$ B) 6m C) 5m D) $\frac{5}{11}m$

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38. When a copper sphere is heated, percentage change is

A) maximum in radius B) maximum in volume

C) maximum in density D) equal in radius, volume and density

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39. During adiabatic process pressure (P) versus density (r) equation is

A) $Pr^{g} = cons\tan t$ B) $Pr^{-g} = cons\tan t$

C) $P^{g}\ r^{1+g} = cons\tan t$ D) $P^{1/g}\ r^{g} = cons\tan t$

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40. According to Wien's displacement law

A) $l_m T^3 = cons\tan t$ B) $l_m T = cons\tan t$

C) $l_m T^2 = cons\tan t$ D) $l_m{}^2 T = cons\tan t$

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41. Two charges each Q are at a distance 'd' apart. They are released. What is the velocity of each charged body of mass m when the distance between them is 2d.

A) $\frac{Q}{\sqrt{8p \in_0 dm}}$ B) $\frac{Q}{\sqrt{4p \in_0 dm}}$

C) $\frac{Q}{\sqrt{3p \in_0 dm}}$ D) $\frac{Q}{\sqrt{5p \in_0 dm}}$

Rough Work

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42. Ratio of magnetic field at the centre of a current carrying coil of radius R and at a distance of 3R on its axis is

A) $10\sqrt{10}$ B) $20\sqrt{10}$ C) $2\sqrt{10}$ D) $\sqrt{10}$

---

43. A magnetic field in a certain region is given by $B = (40\hat{i} - 18\hat{k})G$. How much flux passes through a $5cm^2$ area loop in this region if the loop lies flat on XY-plane?

A) -600 nwb B) -900 nwb C) -400 nwb D) -500 nwb

---

44. In a thermocouple the cold junction is at 30^oC. The temperature of inversion is found to be 540^oC. Then the neutral temperature is

A) 270^oC B) 510^oC C) 285^oC D) 240^oC

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45. The magnetic lines of force inside a bar magnet

A) do not exit

B) depends on area of cross-section of the bar magnet

C) are from N-pole to S-pole of the magnet

D) are from S-pole to N-pole of the magnet

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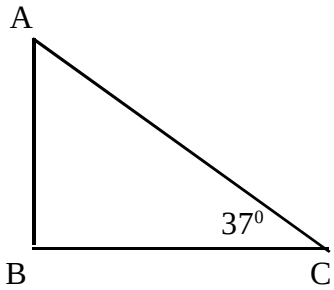
46. ABC is a right angled triangular plate of uniform thickness I_1, I_2 and I_3 are moments of inertia about AB, BC and AC respectively. Then which of the following relation is correct

1. $I_1 = I_2 = I_3$
2. $I_2 > I_1 > I_3$
3. $I_3 < I_2 < I_1$
4. $I_3 > I_1 > I_2$



Rough Work

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47. Two objects of masses 200g and 500g possess velocities $10\hat{i}$ m/s and $3\hat{i}+5\hat{j}$ m/s respectively. The velocity of their centre of mass in m/s is

A) $5\hat{i}+25\hat{j}$ B) $\frac{5}{7}\hat{i}-25\hat{j}$ C) $5\hat{i}+\frac{25}{7}\hat{j}$ D) $25\hat{i}-\frac{5}{7}\hat{j}$

48. Two earth- satellites are revolving in the same circular orbit round the centre of the earth. They must have the same.

A) Mass B) Angular momentum
C) Kinetic energy D) Velocity

49. A particle moves according to the law $x = a\cos\frac{pt}{2}$. The distance covered by it in the time interval between t = 0 to t =3s is

A) 2a B) 3a C) 4a D) a

50. A capillary is dipped in water vessel kept on a freely falling lift then

A) water will not rise in the tube.

B) water will rise to the maximum available height of the tube.

C) water will rise to the height observed under normal condition

D) water will rise to the height below that observed under normal condition.

51. An open and a closed pipe have same length. The ratio of frequencies of their n^{th} overtone is

A) $\frac{n+1}{2n+1}$ B) $\frac{2(n+1)}{2n+1}$ C) $\frac{n}{2n+1}$ D) $\frac{n+1}{2n}$

52. Angle of minimum deviation is equal to the angle of prism A of an equilateral glass prism. The angle of incidence at which minimum deviation will be obtained is

A) 60^o B) 30^o C) 45^o D) $\sin^{-1}\left(\frac{2}{3}\right)$

53. In a double slit experiment instead of taking slits of equal widths, one slit is made twice as wide as the other, then in the interference pattern.

A) The intensities of both the maxima and the minima increases
B) The intersity of the maxima increases and the minima has zero intensity
C) The intensity of maxima decreases and that of minima increases
D) The intensity of maxima decreases and the minima has zero intensity

Rough Work

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54. Equivalent resistance between A and B is

A) $\frac{3}{4}R$ B) $\frac{5}{3}R$ C) $\frac{7}{5}R$ D) R

55. The thermistors are usually made of

A) metals with low temperature coefficient of resistivity

B) semiconducting materials having low temperature coefficient of resistivity

C) metal oxides with high temperature coefficient of resistivity

D) metals with high temparature coefficient of resistivity

56. If the kinetic energy of a free electron doubles, its deBroglie wavelength changes by the factor

A) $\sqrt{2}$ B) $\frac{1}{\sqrt{2}}$ C) 2 D) $\frac{1}{2}$

57. A free neutron decays spontaneously into

A) a proton, an electron and an antineutrino

B) a proton, an electron and neutrino

C) a proton and electron

D) a proton and neutrino

58. Starting with a sample of pure cu^{66}, $\frac{7}{8}$ of it decay into Zn in 15 minutes, the corresponding half life is

A) $7\frac{1}{2}$ minutes B) 5minutes C) 15 minutes D) 10 minutes

59. In the middle of the depletion layer of a reverse biased pn junction, the

A) potential is zero B) electric field is zero

C) potential is maximum D) electric field is maximum

60. Space waves are used for

a) line of sight communication b) satellite communication

A) a only B) b only

C) a and b D) neither a nor b

Rough Work

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Section - III
CHEMISTRY

61. Thallium shows various oxidation states because

A) it is a transition element
B) it shows inert pair effect
C) it is amphoteric
D) it has high reactivity

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62. The temporary hardness of water is due to presence of

A) $NaHCO_3$ B) $Ca(HCO_3)_2$ C) Na_2SO_4 D) $CaSO_4$

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63. Oxone is

A) Na_2O_2 B) $NaBO_3$ C) N_2O D) CaO

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64. Match the following:

I. Synthesis of NH_3	a. Haber process
II. Purification of titanium	b. Van Arkel method
III. Manufacture of caustic soda	c. Castner Kellner process
IV. Purification of bauxite	d. Mond's process
	e. Solvy process
	f. Baeyer's process

	I	II	III	IV
A)	a	b	c	f
B)	b	c	f	a
C)	c	e	d	b
D)	a	c	d	f

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65. Nitrolim is a mixture of

A) $CaCN_2$ + Diamond
B) $Ca(CN)_2$ + Diamond
C) $CaCN_2$ + Graphite
D) $Ca(CN)_2$ + Graphite

---

66. The no. of coulombs required for the conversion of one mole of MnO_4^- to one mole of Mn^{2+} is

A) 96500
B) 96500 X 3
C) 96500 X 5
D) 96500 X 7

Rough Work

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67. The arsenious sulphide sol has negative charge. The maximum coagulation power for precipitating it is of
A) H_2SO_4 B) Na_3PO_4 C) $CaCl_2$ D) $AlCl_3$

68. The rate of reaction may be expressed by the following different ways
$\frac{1}{2}\frac{d[X]}{dt} = -\frac{1}{3}\frac{d[Y]}{dt} = -\frac{d[Z]}{dt}$. The reaction is
A) 2X = 3Y + Z B) 3X + 2Y = 6Z
C) 3Y + Z = 2X D) Y + 6Z = 3X

69. Anionic detergent is
A) cetyltrimethyl ammonium bromide B) glyceryl oleate
C) glyceryl palmitate D) sodium lauryl sulphate

70. The number of mole of AgCl precipitated when $AgNO_3$ is added to one mole of $[Cr(NH_3)_4Cl_2]Cl$ is
A) 0 B) 1 C) 2 D) 3

71. Among the molecules (i) XeO_3 (ii) $XeOF_4$ (iii) XeF_6 those having same number of lone pairs on Xe are
A) (ii) and (iii) only B) (i) and (ii) only
C) (i) (ii) and (iii) only D) (i) and (ii) only

72. During the test of sulphur in organic compound, the purple colour formed by adding sodium nitropruside to Lassaigne's extract is due to
A) $Fe_4[Fe(CN)_6]_3$ B) $Na_3[Fe(CN)_5NS]$
C) $Na_4[Fe(CN)_5NOS]$ D) $Na_4[Fe(CN)_5NO]$

73. The IUPAC name of the compound $CH_3 - CH(CH_3) - CH_2 - CH_2 - OH$ is
A) 2-methyl-4-butanol B) 1-pentanol
C) 2-methyl-1-pentanol D) 3-methyl-1-butanol

74. The number of optical isomers for a compound with 3 different asymmetric carbon atoms is
A) 8 B) 2 C) 4 D) 6

Rough Work

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75. A mixture of C_2H_5I and C_3H_7I is subjected to Wurtz reaction, which one of the following hydrocarbon is not formed during the reaction?

A) Butane B) Hexane C) Pentane D) Propane

76. **Assertion (A):** *C_2H_5Cl gives ethyl benzene with benzene in presence of anhydrous aluminium chloride.*

Reason (R): *$AlCl_3$ act as Lewis acid and generates ethyl carbonium ion electrophile.*

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

B) Both A and R are true but R is not the correct explanation of A

C) A is true but R is false

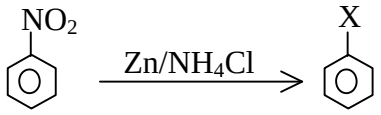
D) A is false but R is true

77. The dehydration of ethyl alcohol either with conc. H_2SO_4 at 170°C or Al_2O_3 at 350°C gives

A) C_2H_6 B) $C_2H_5HSO_4$ C) $C_2H_5OC_2H_5$ D) C_2H_4

78. The product "Y" is $CaC_2 \xrightarrow{H_2O} X \xrightarrow[HgSO_4]{Dil.H_2SO_4} Y$

A) CH_3OH B) C_2H_5OH C) C_2H_4 D) CH_3CHO

79. In the reaction 

; The "X" is

A) $-NH_2$ B) $-NH_4^+ Cl^-$ C) -NO D) -NHOH

80. Which of the following is cross linked polymer?

A) Teflon B) Orlon C) Nylon D) Bakelite

81. An element (atomic mass = $100g.mol^{-1}$) having BCC structure has unit cell edge 400pm. Then density of the element is

A) $10.376g.cm^{-3}$ B) $5.188g.cm^{-3}$ C) $7.289g.cm^{-3}$ D) $2.144g.cm^{-3}$

82. The molarity of solution of glucose containing 36gms of glucose per 400ml of the solution is

A) 0.05 B) 0.5 C) 1.0 D) 2.0

Rough Work

D

83. Which acts as Lewis acid in the reaction $SnCl_2 + 2Cl^- \rightarrow SnCl_4 + 2e^-$?
A) Cl^- B) $SnCl_2$
C) SnCl D) both $SnCl_2$ and $SnCl_4$

84. Anti sterility factor which is necessary for fertility of men and birth process of the female is
A) Vitamin-A B) Vitamin-C C) Vitamin-E D) Vitamin-K

85. For the equilibrium reaction $3Fe_{(s)} + 4H_2O_{(g)} \rightarrow Fe_3O_{4(s)} + 4H_{2(g)}$, the relation between K_p and K_c is
A) $K_p > K_c$ B) $K_p < K_c$ C) $K_p = K_c (RT)^{-2}$ D) $K_p = K_c$

86. X, Y, Z have oxidation numbers +6, -2, -1, respectively. The possible formula of the molecule will be
A) $XY_2 Z_2$ B) $X_2 YZ$ C) XY_2Z D) XYZ_2

87. Equal mass of methane and oxygen are mixed in empty container at 25°C. The fraction of total pressure exerted by oxygen is
A) $\frac{1}{3}$ B) $\frac{1}{2}$ C) $\frac{2}{3}$ D) $\frac{1}{3}\times\frac{273}{298}$

88. If the wavelength of first line of Balmer series of hydrogen atom is 6561A°, the wavelength of the second line of the series should be
A) 13122A° B) 3280A° C) 4860A° D) 2187A°

89. Contaminent is
A) pollutant released from industries
B) a pollutant
C) a component originally not present in environment but released in to environment by human activity
D) pollutant released into the environment in natural calamities

90. The hybridization of carbon in diamond, graphite and acetylene is in the order of
A) sp^2, sp, sp^2 B) sp^3, sp^2, sp C) sp, sp^2, sp^3 D) sp^2, sp^3, sp

Rough Work

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Section - IV

ENGLISH & APTITUDE

Choose the word which can be substituted

91. One who hates mankind

(A) hater (B) repel (C) misanthrope (D) philanthropist

Pick out the meaning of the given word

92. Paramount

(A) above others in rank of authority (B) famous

(C) wide & extensive (D) very important

Choose the exact meaning of the idioms

93. In a nutshell

(A) cheaply (B) in a very short form or in a few words
(C) very rapidly (D) very weakly

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94. To bury the hatchet

(A) to dispute over small things (B) to destroy

(C) to make up a quarrel (D) to repair a costly furniture

Read the following instructions and answers the given questions Pick out the word opposite or nearly so in the meaning of the given words

95. Erudite

(A) ignorant (B) unknown (C) illiterate (D) unfamiliar

Complete the following sentences with fillers

96. The more we looked at the piece of modern art,_____.

(A) it looked better (B) the more we like it

(C) we liked it less (D) the less we liked it

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97. The doctor warns him that unless he gives up smoking _____

(A) will he be able to recover. (B) he will not suffer.

(C) his health will soon be recovered. (D) he will not recover.

Rough Work

D

98. He is so lazy that he _____

(A) always extends help to others to complete their work.

(B) dislikes to postpone the work that he undertakes to do.

(C) can seldom complete his work on time.

(D) can't delay the schedule of completing the work.

Directions-Each sentence has one or two blanks. Choose the word or set of words that best completes the sentence meaningfully.

99. He went to the library …… to find that it was closed.

(A) seldom (B) never

(C) only (D) solely

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100. It would be difficult for one so …… to believe that all men are equal irrespective of caste, race and religion.

(A) emotional (B) democratic (C) intolerant (D) liberal

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101. Her reaction to his proposal was inevitable. She rejected it …….

(A) vehemently (B) violently (C) abruptly (D) angrily

Choose the alternative verb form from those given in brackets:

102. The Headmaster _____ to speak to you.

(A) wants (B) is wanting (C) was wanting (D) had wanted

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103. I _____ a lot of work today.

(A) did (B) have done (C) had done (D) do

Find the sentence that has a mistake in grammar or usage. If you find no mistakes, mark choice D.

104. (A) Either the physicians in this hospital or the chief administrator is going to have to make a decision.

(B) Everyone selected to serve on this jury has to be willing to give up a lot of time.

(C) Kara Wolters, together with her teammates, present a formidable opponent on the basketball court.

(D) No mistakes

Rough Work

D

105. (A) We decided to buy a new car. (B) I enjoy writing picture postcards.

(C) Avoid making silly mistakes. (D) No mistakes

106. (A) He said, "I like this song."

(B) The stuntman advised the audience not to try that at home.

(C) "Where have you spent your money?" she asked him.

(D) No mistakes

107. At present, the ratio between the ages of Arun and Deepak is 4: 3. After 6 years, Arun's age will be 26 years. What is the age of Deepak at present?

(A) 12 years (B) 15 years (C) 16 years (D) 18 years

108. A dishonest milkman professes to sell his milk at cost price, but he mixes it with water, there by gaining 25%. The percentage of water in the mixture is

(A) 25% (B) 30% (C) 20% (D) 15%

109. A person has some birds and sheep. When he counts them he got 50 heads & 148 legs. How many birds and sheep he has?

(A) 24 birds, 26 sheep (B) 26 birds, 24 sheep

(C) 25 birds, 25 sheep (D) 30 birds, 20 sheep

110. The average of 8 numbers is 12. If one of them exceeds the average of the remaining by 8, what is the number?

(A) 16 (B) 17 (C) 18 (D) 19

111. The annual income of A is 10% less than that of B whose income is 20% more than that of C. If the monthly income of C is Rs 200, find the total annual income of A, B, and C together

(A) Rs 7,046 (B) Rs 7,772 (C) Rs 6,872 (D) Rs 7,872

112. A drink vendor has 80 liters of Maaza, 144 liters of Pepsi and 368 liters of Sprite. He wants to pack them in cans, so that each can contains the same number of liters of a drink, and doesn't want to mix any two drinks in a can. What is the least no. of cans required?

(A) 49 (B) 47 (C) 35 (D) 37

113. How many numbers 300 to 600 either begin with or end with the digit 5?

(A) 100 (B) 110 (C) 120 (D) 130

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114. The number 2837393449 is divisible by

(A) 5 (B) 7 (C) 9 (D) 11

115. The unit's digit in the product $7^{71} \times 6^{59} \times 3^{65}$ is

(A) 6 (B) 4 (C) 1 (D) 2

116. Three identical vessels contain the mixture of sprit and water. The ratio of sprit and water in each vessel is 2: 3, 3: 4 and 4: 5 respectively. The mixture of all the three vessels is poured into a big pot. The ratio of sprit and water in the new mixture is

(A) 401/544 (B) 27/37 (C) 19/37 (D) 13/37

117. In which year can the calendar for the year 1985 be used again?

(A) 1988 (B) 1989 (C) 1990 (D) 1991

118. If Ravi got 30% of the maximum marks in an examination and failed by 10 marks however Sanjay who took same examination got 40% of the total and got 15 marks more than passing marks. What are the maximum marks for examination?

(A) 300 (B) 200 (C) 250 (D) 400

119. In an election between two candidates, the candidate who gets 28% of votes polled is defeated by 572 votes. The number of votes polled by the winning candidate is

(A) 1300 (B) 1372 (C) 728 (D) 936

120. A and B are two different alloys of gold and silver having the two metals in the ratio 7: 2 and 7: 1 respectively. If equal quantities of both the alloys are mixed to prepare a third alloy C, then the proportion of gold and silver in C is

(A) 112: 15 (B) 117: 25 (C) 115: 12 (D) 119:25

Rough Work

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SPACE FOR ROUGH WORK

D

SPACE FOR ROUGH WORK