VIGNAN'S
Foundation for Science, Technology & Research
(Deemed to be UNIVERSITY)
-Estd. u/s 3 of UGC Act 1956

V-SAT'21

VIGNAN'S SCHOLASTIC APTITUDE TEST

This booklet contains 24 printed pages

PAPER -1: BIOLOGY, 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

E

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 **E**. 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/E) 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 **2** $\frac{1}{2}$ **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 - BIOLOGY (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.

Name of the Candidate (in Capital Letters):_____

Parent's Mobile No. : ☐☐☐☐☐☐☐☐☐☐ Jr.Inter Marks ☐

School/Coching Centre Name : _____

Residence Adress : _____

_____

State : _____ Pin Code : ☐☐☐☐☐☐

Candidate's Signature : _____ Invigilator's Signature:_____

E

SPACE FOR ROUGH WORK

Rough Work

E

SECTION - I
BIOLOGY

1. Which of the following viruses devoid of protein coat and their body constituted by only RNA

   A. Tobacco mosaic virus B. Potato spindle tuber virus [ ]

   C. Blue tongue virus D. Influenza virus

2. Human beings can not swim by birth, unless learning in the life time. Frogs can swim by birth. Why?

   A. In the humans, lungs are solid & in frogs lungs are hollow [ ]

   B. In the humans, lungs are hollow & in frogs lungs are solid

   C. In the humans, lungs are filled with alveoil & in frog lungs are hollow

   D. None of the above

3. The sequence of development of embryo sac is [ ]

   A. archesporial cell $\rightarrow$ sporogenous cell $\rightarrow$ megaspore mother cell $\rightarrow$ megaspore $\rightarrow$ embryosac

   B. archesporial cell $\rightarrow$ sporogenous cell $\rightarrow$ megaspore $\rightarrow$ megaspore mother cell $\rightarrow$ embryosac

   C. sporogenous cell $\rightarrow$ archesporial cell $\rightarrow$ megaspore $\rightarrow$ megaspore mother cell $\rightarrow$ embryosac

   D. sporogenous cell $\rightarrow$ archesporial cell $\rightarrow$ megaspore mother cell $\rightarrow$ megaspore $\rightarrow$ embryosac

4. Binary fission in Paramecium occurs during which of the following? [ ]

   A. Enough food is available B. Temp is available

   C. Environmental conditions are favourable D. Enough water is available

5. Nucloside is the combination of [ ]

   A. Sugar + phosphate B. Sugar + base

   C. Phosphate + base D. Sugar + phosphate + base

6. How many Barr bodies are found in the human karyotype AA+XO ? [ ]

   A. One B. Two C. Three D. Zero

Rough Work

E

7. Mesokaryon is a [ ]

A. True nucleus present at the centre of the cell

B. Nucleus having condensed chromosomes in interphase and the chromosomes without histones

C. Primitive nucleus not having envelop around it

D. Extra chromosomal DNA present in cytoplasm

8. Path of water in a sponge is [ ]

A. Ostia → Spongoceol → Osculum B. Osculum → Spongocoel → Ostia

C. Ostia → Incurrent canal → Osculum D. Ostia → Excurrent canal → Osculum

9. If the base sequence in a strand of mRNA is - CCU AGG GGG UAG, what would be the sequence on the non-template strand of DNA? [ ]

A. GGA UCG CCC AUC B. CCT AGG GGG TAG

C. GGA TCG CCC ATC D. CCU AGC GGG UAG

10. Blood of hexapods is [ ]

A. Red in colour B. Green in colour C. Blue in colour D. Colour less

11. In a cross between AABB x aabb the ratio of F_2 genotypes between AABB, AaBb, AaBb and aabb would be [ ]

A. 9 : 3 : 3 : 1 B. 7 : 5 : 3 : 1 C. 2 : 1 : 1 : 2 D. 1 : 2 : 2 : 1

12. The characteristic feature of cardiac muscles is [ ]

A. Fatigue B. Rythimicity C. Sarcolemma D. Neurilemma

13. Which of the following is a vulnerable species? [ ]

A. Red panda B. Antelope cervicapra C. Dodo D. Podophyllum

14. Protonema is [ ]

A. An organ with diploid cells B. Juvenile gameetophyte of Moss

C. Formed from the zygote D. Sporohyte of Moss

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15. If the skin of Earthworm dries, what happens to the Earthworm? [ ]

A. Dies due to the failure of nutrition

B. Dies due to the failure of respiration

C. Dies due to the failure of excretion

D. Dies due to the failure of reproduction

16. Correctly match the plants with the types of roots they have. Use the codes given below. [ ]

(i) Viscum	a. Pneumatophores
(ii) Rhizophora	b. Complete parasite
(iii) Taeniophyllum	c. Green roots
(iv) Cuscuta	d. Partial parasite

A. (i) - d ; (ii) - c ; (iii) - a ; (iv) - b B. (i) - b ; (ii) - a ; (iii) - c ; (iv) - d

C. (i) - d ; (ii) -a ; (iii) -c ; (iv) - b D. (i) - d ; (ii) - a ; (iii) - b ; (iv) - c

17. Match the following [ ]

I. Bacillus	P. Pneumonia casuing bacteria
II. Coccus	Q. Escherichia
III. Spirillum	R. Acetobactor
IV. Plemorphic	S. Beggiota

A. I-Q: II-R : III-S : IV-P B. I-R : II-S : III-Q : IV-P

C. I-Q : II-P : III-S : IV-R D. I-P : II-Q : III-S : IV-P

18. Presence of one chromosome extra over the normal chromosome number is called [ ]

A. Nullisomy B. Monosomy C. Trisomy D. Tetrasomy

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E

19. Mammals are identified by the presence of [ ]

A. Milk producing mammary glands B. Hairy exoskelton

C. Opposable thumb D. Dephyodont teeth

20. Ball and Socket joint is [ ]

A. Hip joint B. Elbow joint C. Knee joint D. Pivot joint

21. Assertion-A: The restriction enzymes recognize short sequence of double sranded DNA as targets for cleavage. [ ]

Reason-R: Each enzyme is named by three letter abbreviation, which identifies its origin.

A. A is true, Ris false

B. A is false, R is true

C. Both A and R are true and R is the correct explanation of A

D. Both A and R are true R is not the correct explanation of A

22. Following is used as a 'clot buster' [ ]

A. Streptokinase B. Enterokinase C. Methanogen D. Thinokinase

23. Blood clotting enzyme is [ ]

A. Thrombin B. Thrombokinase C. Rennin D. Vit 'K'

24. Perithecium is a [ ]

A. Sexual fruting body of a fungus

B. Protective covering around sex organs of a moss plant

C. Asexual spore pproducing organ of a fungus

D. Hygroscopic structure helps in the dehiscence of sporangium in a fern

25. Contraction of gall bladder and relaxation are by [ ]

A. Alphacells B. Beta cells of ppancreas

C. Delta cells of pancreas D. 'F' cells of pancreas

Rough Work

E

26. How many types of gametes are produced from the genotype Cc Dd Ee? [ ]

A. Four B. Six C. Eight D. Sixteen

27. Following is the character required for an ideal cloning vector [ ]

A. High molecular weight

B. Bearing resistance to antibiotics

C. Many sites for the activity of restriction enzymes

D. Cannot replicate in the host cell

28. Housefly has [ ]

A. 3 pairs of legs & 1 pair of wings

B. 3 pairs of legs & 3 pairs of wings

C. 3 pairs of legs & 2 pairs of wings

D. 3 pairs of legs & 4 pairs of wings

29. Study the following statements regarding Cycas [ ]

I. Presence unbranched stems

II. Presence of conjoint, collateral and closed vascular bundles

III. Presence of siphonostele

Choose the combination of correct statements

A. I & II are correct B. II & III are correct C. I only is correct D. All are correct

30. According to Hardy & Weinbberg principle, when 'AA' individual is crossed wth 'aa' individual, in 'F_1' progeny what are the genotypic frequencies of AA, Aa & aa? [ ]

A. 0, 1, 0 B. 0.5, 0.5, 0 C. 0, 0.5, 0.5 D. 1, 0, 0

Rough Work

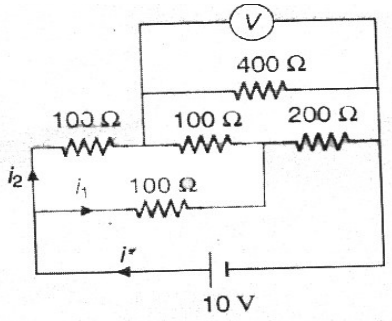
E

SECTION - II
PHYSICS

31. A sonometer wire under tension of 64N vibrating in its fundamental mode is in resonance with a vibrating tuning fork. The vibrating portion of that sonometer wire has a length of 10 cm and a mass of 1 *gm*. The vibrating tuning fork is now moved away from the vibrating wire with a constant speed and an observer standing near the sonometer hears one beat per second. The speed with which the turning fork is moved is _____ (nearly) (speed of second in air is 300*m/s*) [ ]

A. 1 m/s B. 0.75 m/s C. 2.5 m/s D. 1.25 m/s

32. An electrical circuit is shown in fig .The potential difference across the resistor of $400\,\Omega$ as measured by a voltmeter *V* of resistance $400\,\Omega$ is [ ]



A. Zero volt B. 5 V

C. 10/3 V D. 20/3 V

33. A motor boat is racing towards north at 10 *km/hr* and the water current in that region is 10 *km/hr* in the direction of 60^0 east of south. The resultant velocity of the boat is [ ]

A. 10 km/hr due east B. 10 km/hr 60^0 east of north

C. 12 km/hr 30^0 east of north D. 20 km/hr north east

34. A radioactive sample decays by 63% of its initial value in 10 *sec*. If would have decayed by 50% of its initial value in [ ]

A. 7 sec B. 14 sec C. 5 sec D. 1.4 sec

35. 1.5 m W of $4000A^0$ light is directed at a photoelectric cell. If 0.10 percent of the incident photons produce photoelectrons, the current in the cell is (take $h = 6.6 \times 10^{-34}$ *J.s*, $c = 3 \times 10^8$ *m/s*, $e = 1.6 \times 10^{-19} C$)

A. $1.16\mu A$ B. $0.59\mu A$ C. $0.48\mu A$ D. $0.79\mu A$ [ ]

36. Consider a spring pendulum executing damped oscillations. If mass of block is 200*gm*, spring constant is $90\,N/m$ and damping constant *b* = 40 *gm/sec*, the time taken for its amplitude of oscillation to drop to half of the initial value is [ ]

A. 0.3 sec B. 3.46 sec C. 6.93 sec D. 0.15 sec

Rough Work

E

37. One mole of diatomic ideal gas is heated at constant volume until the pressure is doubled and again heated at constant pressure until the volume is doubled. The average molar heat capacity for the whole process is [ ]

A. $\frac{13R}{6}$ B. $\frac{19R}{6}$ C. $\frac{17R}{6}$ D. $\frac{23R}{6}$

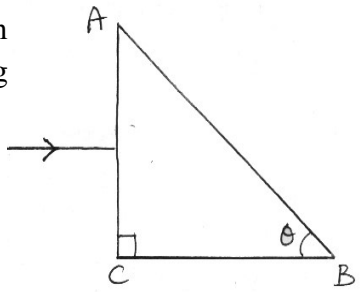
38. Young's double slit experiment is made in a liquid. The 10^{th} bright fringe in liquid lies where 6^{th} dark fringe lies in vacuum. The refractive index of the liquid is approximately [ ]

A. 1.54 B. 1.2 C. 1.8 D. 1.67

39. The acceleration of an electron at a certain moment in a magnetic field $\vec{B} = 2\hat{i} - \hat{j} + \hat{k}$ is $\vec{a} = \hat{i} + x\hat{j} + 3\hat{k}$. The value of x is [ ]

A . 5 B. 0.5 C. 1.5 D. 2

40. What should be the value of angle θ so that light entering normally through the surface AC of a prism (RI n = 3/2) does not cross the second refracting surface AB [ ]



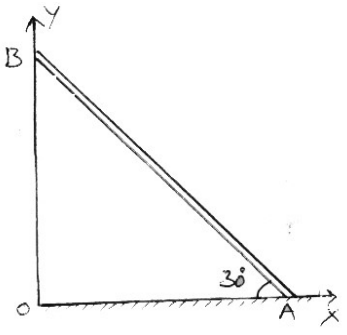
A. $\theta < Cos^{-1} 2/3$ B. $\theta > Sin^{-1} 2/3$

C. $\theta > Cos^{-1} 2/3$ D. $\theta < Sin^{-1} 2/3$

41. The specific heat of a substance varies as $(3t^2 + t)10^{-3}\ cal/gm^0c$. The amount of heat required to rise the temperature of *1kg* of substance from 10^0c to 20^0c is [ ]

A. 7150 cal B. 8200 cal C. 9250 cal D. 750 cal

42. A rod AB rests with the end A on rough horizontal ground and the end B against a smooth vertical wall. The rod is uniform and of weight W. If the rod is in equilibrium in the position shown in figure, the frictional force at A is [ ]



A. $\sqrt{3}W$ B. $\frac{2}{\sqrt{3}}W$

C. W D. $\frac{\sqrt{3}}{2}W$

Rough Work

E

43. A convex lens of focal length 10 cm and a planoconcave lens of focal length 20 cm are placed in contact. The lateral magnification of an object at 10 cm from the combination of lenses is [ ]

A. -2 B. +2 C. +1.5 D. -3

44. Four dipoles each of magnitudes of charges '$\pm e$' are placed inside a sphere. The total flux of $\vec{E}$ coming out of the sphere is [ ]

A. $\frac{1}{\epsilon_O}(4e)$ B. $\frac{8e}{\epsilon_O}$ C. Zero D. $\frac{e}{\epsilon_O}$

45. A length scale (λ) depends on the permittivity $(\in)$ of a dielectric material, Boltzmann constant (K_B), the absolute temperature (T) the number per unit volume (n) of certain charged particles, and the charge (q) carried by each of the particles. Which of the following expression for λ is dimensionally correct?

A. $\lambda = \frac{nq^2}{\in K_B T}$ B. $\lambda = \frac{q^2 K_B T}{n \in}$ C. $\lambda = \sqrt{\frac{\in K_B T}{nq^2}}$ D. $\lambda = \sqrt{\frac{q^2 K_B T}{n^{1/3} \in}}$ [ ]

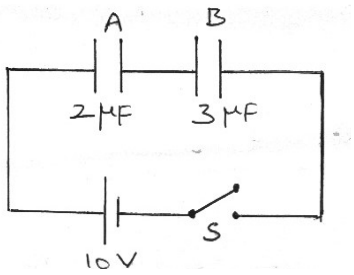
46. Two capacitors A and B are connected in series with a battery as shown in fig. When switch 'S' is closed and the two capacitors get charged fully, then [ ]

A. The potential difference across the plates of A is 4 V and across the plates of B is 6 V

B. The ratio of charges in A and B is 3:2

C. The ratio of electrical energies stored in A and B is 2:3

D. The potential difference across the plates of A is 6 v and across the plates of B is 4 V



47. When a Ferro magnetic material is subjected to magnetisation and demagnetisation cycles with a frequency of *n Hz* and if the loss of energy is completely used to rise the temperature of the material then the rise in temperature of material in time '*t*' is (ρ is density of material, *s* is specific heat of material and E_0 = Area of B-H curve)
[ ]

A. $\frac{nE_o t}{\rho s}$ B. $\frac{nE_o}{\rho st}$ C. $\frac{nE_o s}{\rho st}$ D. $\frac{\rho s}{nE_o t}$

Rough Work

E

48. A cylindrical tube open at both ends has a frequency '*f*' in air. The tube is dipped vertically in water so that half of it is in water .The first overtone of the air column is now [ ]

A. f B. $3f$ C. $\frac{3f}{2}$ D. $\frac{4f}{3}$

49. Two non mixing liquids of densities ρ and 2ρ are put in a cylinder. The height of each liquid is *h*. A solid cylinder of length L and density σ is put in this container. The cylinder floats with its axis vertical and length $xL(x<1)$ in the denser liquid. The density σ is equal to [ ]

A. $x\rho$ B. $(1-x)\rho$ C. $(1+x)\rho$ D. $\frac{\rho}{(1-x)}$

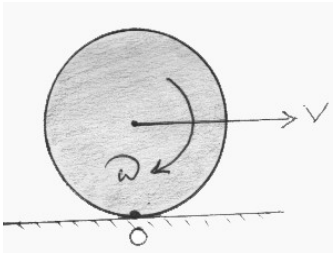
50. An artificial satellite is moving in a circular orbit around the earth with a speed equal to half the magnitude of escape velocity from the earth surface. If the satellite is stopped suddenly in its orbit and allowed to fall freely onto the earth, the speed with which it hit the surface of earth is [ ]

A. $\sqrt{gR}$ B. $\sqrt{\frac{2GM}{R}}$ C. $\sqrt{\frac{gR}{2}}$ D. $\sqrt{\frac{3GM}{2R}}$

51. A circular disc of mass *m* and radius R is set into motion on a horizontal floor with a linear speed V in the forward direction and an angular speed $\omega = \frac{V}{R}$ in clock wise direction as shown in fig . The magnitude of total angular momentum of the disc about bottom most point 'O' of the disc is [ ]

A. mVR B. $\frac{mVR}{2}$

C. $\frac{3mVR}{2}$ D. $\frac{2}{3}mVR$



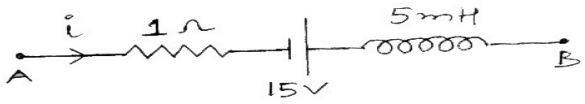
52. A battery has an open circuit potential difference of $6\,V$ between its terminals .when a load resistance of $60\,\Omega$ is connected across the battery, the power dissipated by the battery is $0.4W$. The load resistance *R*, so that maximum power will be dissipated in *R* is [ ]

A. $30\,\Omega$ B. $60\,\Omega$ C. $15\,\Omega$ D. $6\,\Omega$

Rough Work

E

53. The network shown in the fig is a part of complete circuit. What is the potential difference (V_B-V_A) when the current *i* is 5A and is decreasing at a rate of 10^3 A/s? [ ]



A. 5 V B. 15 V C. 10 V D. 20 V

54. A spherical body with radius 12 *cm* radiates 450W power at 500K. If the radius was halved and temperature doubled, the power radiated is [ ]

A. 1800 W B. 450 W C. 900 W D. 225 W

55. After perfect inelastic collision between two identical balls moving with same speed in different directions, the speed of the combined mass becomes half the initial speed. The angle between the two before collision is [ ]

A. 90^0 B. 45^0 C. 60^0 D. 120^0

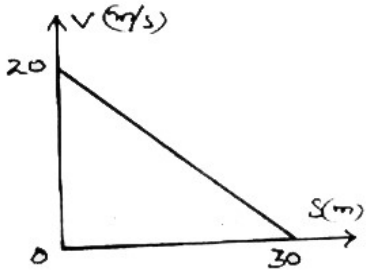
56. A carrier wave of peak voltage 12V is used to transmit a message signal. The peak value of the modulating signal in order to have a modulation index of 75% is [ ]

A. 3 V B. 9 V C. 6 V D. 21 V

57. If the velocity *V* of a particle moving along a straight line decreases linearly with its displacement '*S*' from *20m/s* to a value approaching zero at *S=30m* , the acceleration of the particle at *S= 15m* is [ ]

A. $\frac{2}{3} m/s^2$ B. $\frac{20}{3} m/s^2$

C. $\frac{-2}{3} m/s^2$ D. $\frac{-20}{3} m/s^2$



58. Ionisation potential of hydrogen atom is 13.6 V. Hydrogen atoms in the ground state are excited by monochromatic radiation of photon energy 12.1ev .The spectral lines emitted by hydrogen atom according to the Bohr's theory will be [ ]

A. One B.Two C. Three D. Four

Rough Work

E

59. A flask contains argon and chlorine in the ratio of 2 : 1 by mass. The temperature of the mixture is 27^0c. The ratio of average kinetic energy per molecule of the two gases is [ ]

(Atomic mass of argon = 39.9 u, Molecular mass of chlorine = 70.9 u)

A. 1 : 2 B. 2 : 1 C. 1 : 33 D. 1 : 1

60. A body of mass 1*kg* begins to move under the action of a time dependent force $\vec{F} = \left(2t\hat{i} + 3t^2\hat{j}\right)N$, where $\hat{i}$ and $\hat{j}$ are unit vectors along X and Y axis. The power developed by the force at the time *'t'* is [ ]

A. $\left(2t^3 + 3t^5\right)W$ B. $\left(2t^2 + 4t^4\right)W$ C. $\left(2t^3 + 3t^4\right)W$ D. $\left(2t^2 + 3t^3\right)W$

Rough Work

E

SECTION - III
CHEMISTRY

61. Which artificial sweetener contains chlorine? [ ]

A. Sucralose B. Aspartame C. Alitame D. Saccharin

62. Mixture used for tips of match stick is [ ]

A. *white* $P_4 + K_2Cr_2O_7 + S$ B. *R*ed $P_4 + K_2Cr_2O_7 + S$

C. *R*ed $P_4 + S$ D. *R*ed $P_4 + K_2Cr_2O_7 + S$

63. Which one of the following is the correct statement? [ ]

A. Boric acid is a protonic acid

B. Beryllium exhibits coordination number 6

C. Chlorides of both Be and Al have chlorobridge structures in solid phase

D. $B_2H_6 - 2NH_3$ is known as in organic benzene

64. The number of $p\pi - d\pi$ *pi* bonds present in Xeo_3 and Xeo_4 molecular respectively [ ]

A. 3, 4 B. 4, 2 C. 2, 3 D. 3, 2

65. In which of the following pairs the two species are not isostructural [ ]

A. Co_3^{2-} and No_3^- B. PCl_4^+ and $SiCl_4$ C. PF_5 and BrF_5 D. AlF_6^{3-} and SF_6

66. Given $E^0_{Cr^{+3}/Cr} = -0.72V$, $E^0_{Fe^{+2}/Fe} = -0.42V$. The potential for the cell [ ]

$Cr/Cr^{+3}(0.1M)//Fe^{+2}(0.01M)/Fe$ is

A. 0.26V B. 0.399V C. -0.339V D. -0.26V

67. Iodoform can be prepared from all except [ ]

A. Ethyl methyl ketone B. Isopropyl alcohol

C. 3-methyl -2 butanone D. Isobutyl alcohol

Rough Work

E

68. In the presence of peroxide *HCl* and *HI* do not give anti Markownikoff's addition to alkenes because

A. HCl is oxidizing and HI is reducing B. All the steps are exothermic in HCl and HI [ ]

C. Both HCl and HI are storong acids D. One of the steps is endothermic is HCl and HI

69. The IUPAC name of $(CH_3)_2CH-CH=CH-CH=\underset{\displaystyle C_2H_5}{\underset{|}{CH}}-CH_3$ is [ ]

A. 2, 7- dimethyl – 3, 5 - nonadiene B. 2,7- dimethyl – 2- ethyl heptadiene

C. 2 – methyl-7-ethyl-3, 5 octadiene D. 1, 1- dimethyl -6-ethyl - 2, 4 heptadiene

70. $SiCl_4$ on hydrolysis form *X* and *HCl* compound 'X' loses water at 1000^0 C gives Y. Compounds X and Y respectively are [ ]

A. H_2SiCl_6, Sio_2 B. H_4Sio_4, Si C. Sio_2, Si D. H_4Sio_4, Sio_2

71. Among the following the maximum equivalent character is shown by the compound

A. $AlCl_3$ B. $MgCl_2$ C. $FeCl_2$ D. $SnCl_2$ [ ]

72. Identify A and B respectively in the following reaction [ ]

$$Br-CH_2-CH_2-Br \xrightarrow[Ag^+oAc^-]{excess} A \xrightarrow{hydrodlysis} B+2AcOH$$

A. 1, 2 - di acetoxy ethane and 1,2 - dibromo ethane

B. 1, 2 - di acetoxy ethane and ethylene glycol

C. Ethylene glycol and glycerol

D. Ethylene glycol and glycerol

73. $CH_3CH_2I \xrightarrow{NaCN} A \xrightarrow[Partial\ hydrolysis]{} B \xrightarrow[Br_2;NaOH]{} C$ The major product 'C' is

A. $CH_3CH_2NH_2$ B. $CH_3CH_2CH_2NH_2$ [ ]

C. $\underset{\displaystyle CH_3}{\underset{|}{CH_3-CH}}-NH_2$ D. $CH_3CH_2CONH_2$

Rough Work

E

74. In hydrogen atom the electron is at a distance of $4.768 A^0$ from the nucleus. The angular momentum of the electron is [ ]

A. $\frac{h}{2\pi}$ B. $\frac{3h}{2\pi}$ C. $\frac{9h}{2\pi}$ D. $\frac{1.5h}{2\pi}$

75. Copper becomes green when exposed to moist air for a long time this is due to [ ]

A. Formation of a layer of cupric oxide on the surface of copper

B. The formation of basic copper sulphate layer on the surface of the metal

C. The formation of a layer of cupric hydroxide on the surface

D. The formation of a layer of basic carbonate of copper on the surface of copper

76. An octahedral complex with molecular composition $M.5NH_3.Cl.SO_4$ has two isomers A and B .The solution of A gives white ppt with $AgNO_3$ solution and the solution of B gives white ppt with $BaCl_2$ solution. The type of isomerism exhibited by the complex is [ ]

A. Linkage isomerism B. Coordinate isomerism

C. Geometrical isomerism D. Ionisation isomerism

77. For a first order reaction A $\rightarrow$ products the concentration of A changes from 0.1 M to 0.025M in 40minutes. The rate of reaction when the concentration of A is 0.01M is [ ]

A. $1.73X10^{-5}$ M/min B. $3.47X10^{-4}$M/min C. $3.47x10^{-5}$M/min D. $1.73x10^{-4}$ M/min

78. An iron hall has a mass of 35 *gms* and a speed of *50 m/sec*. If the speed can be measured with an accuracy of 2% then the uncertainty in the position [ ]

A. $1.507 x10^{-34}$ m B. $1.507x 10^{-31}$ m C. $1.507x 10^{-33}$ m D. $1.507x10^{-32}$ m

79. The compressibility factor for a real gas at high pressure is [ ]

A. $1+\frac{RT}{Pb}$ B . 1 C. $1+\frac{Pb}{RT}$ D. $1-Pb/RT$

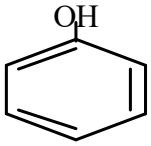
Rough Work

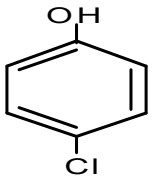
E

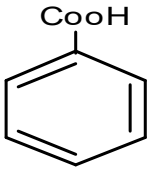
80. For the estimation of nitrogen 1.4*g* of an organic compound was digested by Kjeldhal method and the evolved ammonia was absorbed in 60 *ml* of $\frac{M}{10}$ sulphuric acid .The unreacted acid required 20 *ml* of $\frac{M}{10}$ sodium hydroxide for complete neutralization. The percentage of nitrogen in the compound is

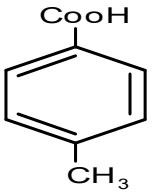
A. 5% B. 6% C. 10% D. 3 % [ ]

81. Phenol $\xrightarrow[dust]{Z_n} X \xrightarrow[AnhyAlcl_3]{CH_3Cl} y \xrightarrow[KMno\,4]{Alk} z$ [ ]

A. 

B. 

C. 

D. 

82. Which one of the following is an example of thermosetting polymer? [ ]

A. Nylon 6, 6 B. Bakelite C. Neoprene D. Bunna-N

83. 3g of activated charcoal was added to 50 ml of acetic acid solution (0.06N) in a flask .After an hour if was filtered and the strength of the filtrate was found to be 0.042N. The amount of acetic acid adsorbed (per gram of charcoal) is [ ]

A. 42 mg B. 54 mg C. 18 mg D. 36 mg

84. The chemical entities present in thermosphere of the atmosphere [ ]

A. O_2^+, O^+, NO^+ B. O_3

C. N_2, O_2, CO_2, H_2O D. O_3, O_2^+, O_2

Rough Work

E

85. The *emf* of the following three galvanic cells are represented by E_1, E_2 and E_3 respectively which of the following is correct [ ]

1. $Zn/Zn^{+2}(1M)\,//\,Cu^{+2}(1M)/Cu$
2. $Zn/Zn^{+2}(0.1M)\,//\,Cu^{+2}(1M)/Cu$
3. $Zn/Zn^{+2}(1M)\,//\,Cu^{+2}(0.1M)/Cu$

A. $E_1 > E_2 > E_3$ B. $E_3 > E_2 > E_1$ C. $E_3 > E_1 > E_2$ D. $E_2 > E_1 > E_3$

86. The equilibrium constant (K_c) for the reaction $N_{2(g)} + O_{2(g)} \Leftrightarrow 2NO_{(g)}$ at temperature T is $4x10^{-4}$.

The value of K_c for the reaction $NO_{(g)} \rightarrow \frac{1}{2}N_{2(g)} + \frac{1}{2}O_{2(g)}$ at the same temperature is [ ]

A . 0.02 B. 2.5×10^{-2} C. 4×10^{-4} D. 50.0

87. Which pair of oxy acids of phosphorous contain P-H bonds [ ]

A. H_3PO_4, H_3PO_3 B. $H_3PO_5, H_4P_2O_7$ C. H_3PO_3, H_3Po_2 D. H_3Po_2, HPo_3

88. Accumulation of which of the following molecules in the molecules occurs as a result of vigorous excercise

A. L-Lactic acid B. Glycogen C. Pyruvic acid D. Glucose [ ]

89. Two liquids X and Y forms an ideal solution at 300k vapour pressure of the solution containing 1mol of X and 3 mol of Y is 550 mm of Hg. At the same temperature if 1 mol of Y is further added to this solution. Vapour pressure of the solution increased by 10mm Hg. Vapour pressure (in mm Hg) of X and Y in their pure states will be respectively [ ]

A. 200 and 300 B. 300 and 400 C. 400 and 600 D. 500 and 600

90. For complete combustion of ethanol $C_2H_5OH(l) + 3O_2(g) \rightarrow 2CO_2(g) + 3H_2O(l)$ the amount of heat produced as measured in bomb calorimeter is 1364.47 kj mol^{-1} at 25^0c assuming ideality the enthalpy of combustion $\Delta_c H$ for the reaction will be [ ]

A. -1350.50 kj mol^{-1} B . -1366.95 kj mol^{-1} C. -1361.95 kj mol^{-1} D. -1460.50 kj mol^{-1}

Rough Work

E

SECTION - IV
ENGLISH / APTITUDE

91. Neena ____ the report by monday. [ ]

A. will submit B. will have submitted C. is submitting D. will be submitting

92. We spent an hour discussing about his character. [ ]

A. on his character B. of his character C. his character D. no improvement

93. If $A = x\%$ of y and $B = y\%$ of x, then which of the following is true? [ ]

A. A is smaller than B. B. A is greater than B

C. A is equal to B. D. If x is smaller than y, then A is greater than B.

94. They _____ the old wall when it collapsed.

A. are painting B. was painting C. were painting D. paint [ ]

95. If *log* 27 = 1.431, then the value of log 9 is [ ]

A. 0.934 B. 0.945 C. 0.954 D. 0.958

96. A man rows to a place 48 *km* distant and come back in 14 *hours*. He finds that he can row 4 *km* with the stream in the same time as *3 km* against the stream. The rate of the stream is [ ]

A. 1 *km/hr* B. 1.5 *km/hr* C. 2 *km/hr* D. 2.5 *km/hr*

97. The sum of three numbers is *98*. If the ratio of the first to second is *2 :3* and that of the second to the third is *5 : 8*, then the second number is [ ]

A. 20 B. 30 C. 48 D. 58

98. Speed of a boat in standing water is 9*kmph* and the speed of the stream is 1.5*kmph*. A man rows to a place at a distance of 105*km* and comes back to the starting point. The total time taken by him is

A. 16 *hours* B. 18 *hours* C. 20 *hours* D. 24 *hours* [ ]

99. The salaries *A, B, C* are in the ratio 2 : 3 : 5. If the increments of 15%, 10% and 20% are allowed respectively in their salaries, then what will be new ratio of their salaries? [ ]

A. 3 : 3 : 10 B. 10 : 11 : 20 C. 23 : 33 : 60 D. Cannot be determined

Rough Work

E

100. *A* runs 1 time as fast as *B*. If A gives B a start of 80 *m*, how far must the winning post be so that *A* and *B* might reach it at the same time? [ ]

A. 200 m B. 300 m C. 270 m D. 160 m

101. The fourth proportional to 5, 8, 15 is [ ]

A. 18 B. 24 C. 19 D. 20

102. None of the clerks came, _____ ?

A. didn't B. did they C. do they D. didn't they [ ]

Choose the suitable meaning from the options for the underlined expression.

103. We should give a wide berth to bad characters. [ ]

A. give publicity to B. not sympathies C. keep away from D. publicly condemn

Sentence improvement.

104. Two pipes *A* and *B* together can fill a cistern in 4 *hours.* Had they been opened separately, then *B* would have taken *6 hours* more than *A* to fill the cistern. How much time will be taken by *A* to fill the cistern separately? [ ]

A. 1 hour B. 2 hours C. 6 hours D. 8 hours

105. In a 300 *m* race *A* beats *B* by 22.5 *m* or 6 *seconds*. *B*'s time over the course is [ ]

A. 86 sec B. 80 sec C.76 sec D. None of these

106. Children were excited to see a _____ of candies. [ ]

A. mint B. plague C. wisp D. prattle

107. In a 100 *m* race, *A* can beat *B* by 25*m* and *B* can beat *C* by 4*m*. In the same race, *A* can beat *C* by

A. 21 *m* B. 26 *m* C. 28 *m* D. 29 *m* [ ]

Rough Work

E

Choose the correct alternative.

108. Sunitha said that she _____ on this novel for five years. [ ]

A. has been working B. had been working

C. have been working D. will work

109. A man takes twice as long to row a distance against the stream as to row the same distance in favour of the stream. The ratio of the speed of the boat (in still water) and the stream is [ ]

A. 2 : 1 B. 3 : 1 C. 3 : 2 D. 4 : 3

110. He has been living here _____a month.

A. from B. since C. for D. of [ ]

Fill in the blanks with suitable relative pronouns.

111. Seats for Mathematics, Physics and Biology in a school are in the ratio 5 : 7 : 8. There is a proposal to increase these seats by 40%, 50% and 75% respectively. What will be the ratio of new seats?

A. 2 : 3 : 4 B. 6 : 7 : 8 C. 6 : 8 : 9 D. None of these [ ]

112. Here is a pen ____ you lost.

A. where B. what C. which D. when [ ]

Choose the suitable meaning from the options for the underlined expression.

113. Bharat goes to the office _____ foot.

A. on B. by C. in D. with [ ]

114. A boatman goes 2 *km* against the current of the stream in 1 *hour* and goes 1 *km* along the current in 10 *minutes*. How long will it take to go 5 *km* in stationary water? [ ]

A. 40 minutes B. 1 hour C. 1 hr 15 min D. 1 hr 30 min

115. The boy had a <u>hair – breadth</u> escape from the street accident. [ ]

A. a lucky B. a quick C. an easy D. a narrow

Rough Work

E

Choose the suitable meaning from the options for the underlined expression.

116. Neither the principal nor his colleagues _____ given any explanation for this. [ ]

A. has B. have C. are D. were

Fill in the blanks with the suitable collective names front he options give below.

117. He was struck ____ lightning.

A. with B. by C. for D. at [ ]

118. The clown was being laughed at by them. [ ]

A. they were laughing at the clown B. they were laughing on the clown

C. they laughed at the clown D. the clown was laughed at by them

Choose the correct alternative question tag.

119. He made a plan <u>to murder in cold blood.</u> [ ]

A. murder some one in sleep B. to kill a hibernating animal

C. to commit a preplanned murder D. to kill some one accidentally

Choose the opt one from the following.

120. If 40% of a number is equal to two-third of another number, what is the ratio of first number to the second number? [ ]

A. 2 : 5 B. 3 : 7 C. 5 : 3 D. 7 : 3

Rough Work

E

SPACE FOR ROUGH WORK

Rough Work

E

SPACE FOR ROUGH WORK

Rough Work