MEDICAL

(SAMPLE PAPER)

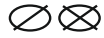
SESSION: 2022-23

IMPORTANT INSTRUCTIONS

A. GENERAL INSTRUCTIONS

1. The Test is of **2 hours duration.**
2. The Test Paper consists of 90 Questions. **The Maximum Marks are 360.**
3. The Test Paper consists of five sections - **Section I (Aptitude), Section II (Physics), Section III (Chemistry), Section IV (BOTANY) & Section V (ZOOLOGY).**
4. There are 10 Questions each in Section I and 20 Questions each in Section II, III, IV & V.
5. +4 marks will be given for each correct answer and –1 mark for each wrong answer. In all other cases, no marks will be given.
6. There is only one correct response for each question. Filling up more than one response in each question will be treated as wrong response and marks for wrong response will be deducted accordingly as per instruction 5 above.

B. HOW TO ANSWER THE QUESTION

1. **Use HB pencil/ Ball Pen (Blue or Black) only to mark your answer in the OMR sheet.**
2. For each question there are multiple choices. One of them is the correct answer.
3. Fill appropriate bubble like this wherever and not like this  .
4. Mark your response by filling correct option.
5. Please ensure that you fill answer against the correct question number.
6. Use the rough area provided for rough work.

C. RESTRICTIONS DURING THE TEST

1. Calculators are not allowed in this test.
2. Use of mobile phones in the examination hall is strictly prohibited.
3. Log tables and electronic gadgets in any form are not allowed.
4. No additional sheets will be provided for rough work.

D. HELPFUL HINTS

1. Work quickly and accurately.
2. If you are not sure of an answer, mark your best choice and avoid wild guessing.

E. ON COMPLETION OF THE TEST

1. Please ensure your details are properly filled.
2. Handover the test booklet to the invigilator.
3. Ensure that your details are properly filled in the OMR sheet.

SAMPLE TEST PAPER

APTITUDE (SECTION - I)

1. If '–' stands for '÷', '÷' stands for '+', '+'stands for '×' and '×' stands for '–', then what is the value of $18 \div 9 \times 4 + 5 - 10 \div 5$?

(a) 24 (b) 30
(c) 33 (d) 42

2. In a certain code language if the word 'SOCIAL' is coded as 'TMFEFF', then how will the word 'CENTER' be coded in that language?

(a) DCQPJX (b) DCQPJL
(c) DCQXJL (d) DGQXJX

3. Father says to his son: "I am three times as old as I was when you were born". If the current age of son is 40 years, then the current age of father is:

(a) 90 years (b) 51 years
(c) 60 years (d) 69 years

4. X can do a piece of work in 6 days and Y can do the same work in 12 days. X and Y together can do the same work in

(a) 4 days (b) 8 days
(c) 9 days (d) 6 days

5. M is N's brother. S is D's mother and N's aunt. How is D related to M ?

(a) Sister
(b) Cousin
(c) Aunt
(d) Cannot be determined

6. Three years ago, the average age of the family of 5 members was 17 years. A baby having been born, the average age of the family is the same today. How old is the baby today?

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

7. A monkey climbs 30 feet at the beginning of each hour and rests for a while when he slips back 20 feet before he again starts climbing in the beginning of the next hour. If he begins his ascent at 8.00 am, at what time will he first touch a flag at 120 feet high?

(a) 8 pm (b) 7 pm
(c) 6 pm (d) 5 pm

8. A and B start running (from the same point) along the circumference of a circle with speed π m/s and 3π m/s respectively. If the radius of the circle is 2m, then after how much time from the start, A & B will meet again

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

9. If $5 + 3 + 2 = 1501$
$9 + 2 + 4 = 1863$
$8 + 6 + 3 = 4842$
$5 + 4 + 5 = 2052$
Find $7 + 2 + 5$

(a) 1453 (b) 1401
(c) 1410 (d) 1435

10. There are 25 horses among which you need to find out the fastest horse. You can conduct race among at most 5 to find out their relative speed. At no point you can find out the actual speed of the horse in a race. Find out how many races are required to get the fastest horse.

(a) 5 (b) 6
(c) 7 (d) 8

Space for rough work

SAMPLE TEST PAPER

PHYSICS (SECTION - II)

11. A particle moves along the x-axis from $x = 0$ to $x = 5$ under the influence of a force given by $F = 7 - 2x + 3x^2$. The work done in theprocess is-

(a) 70 J (b) 270 J

(c) 35 J (d) 135 J

12. The engine of a car produces an acceleration of 6 ms^{-2} in the car. If this car pulls another car of the same mass, then the accelerationwould be

(a) 6 ms^{-2} (b) 12 ms^{-2}

(c) 3 ms^{-2} (d) 1.5 ms^{-2}

13. An electron is projected with uniform velocity along the axis of a current carrying long solenoid. Which of the following is true?

(a) The electron will be accelerated along the axis.

(b) The electron path will be circular about the axis.

(c) The electron will experience a force at 45° to the axis and hence execute a helical path.

(d) The electron will continue to move with uniform velocity along the axis of the solenoid.

14. A galvanometer of resistance 22.8 Ω measures 1 A. How much shunt should be used, so that it can be used to measure 20 A?

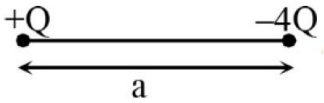
(a) 1Ω

(b) 2Ω

(c) 1.2Ω

(d) 2.2Ω

15. Diagram shows two charges placed at 'a' separation. A positive charge q is to be placed in such a way that net force acting on Q and –4Q be zero then



(a) q must be placed between Q and –4Q

(b) q must be placed to the left +Q

(c) q must be placed to the right of –4Q

(d) It is possible for any position of q

16. A point Q lies on the perpendicular bisector of an electrical dipole of dipole moment p. If the distance of Q from the dipole is *r* (much larger than the size of the dipole) then the electric field at Q is proportional to

(a) p^2 and r^{-3} (b) p and r^{-2}

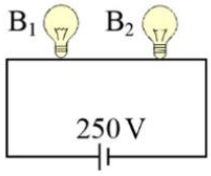
(c) p^{-1} and r^{-2} (d) p and r^{-3}

17. Two bodies A (of mass 1 kg) and B (of mass 3 kg) are dropped from heights of 16 m and 25 m, respectively. The ratio of the time taken bythem to reach the ground is

(a) 4/5 (b) 5/4

(c) 12/5 (d) 5/12

18. Bulb B_1 (100 W –250 V) and bulb B_2 (100 W –200 V) are connected across 250 V. What is potential drop across B_2?



(a) 200 V (b) 250 V

(c) 98 V (d) 48 V

Space for rough work

SAMPLE TEST PAPER

19. An inductor of reactance 1 Ω and a resistor of 2 Ω are connected in series to the terminals of a 6 V (rms) a.c. source. The power dissipated in the circuit is

(a) 8 W (b) 12 W

(c) 14.4 W (d) 18 W

20. If a body loses half of its velocity on penetrating 4 cm in a wooden block, then how much will it penetrate more before coming to rest?

(a) 1 cm (b) 2 cm

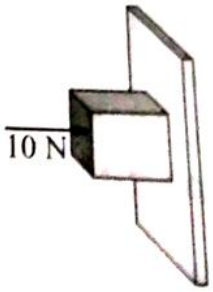
(c) 3 cm (d) None of these

21. The periodic time of S.H.M. of amplitude 2 cm is 5 sec. If the amplitude is made 4 cm, its periodic time will be-

(a) 2.5 s (b) 5 s

(c) 10 s (d) $5\sqrt{2}$ s

22. A horizontal force of 10 N is necessary to just hold a block stationary against a wall. The coefficient of friction between the block and the wall is 0.1. The weight (in N) of the block is _____.



(a) 3 (b) 2

(c) 1 (d) None of these

23. A parallel plate condenser with oil between the plates (dielectric constant of oil $K = 2$) has a capacitance C. If the oil is removed, then capacitance of the capacitor becomes

(a) $\frac{C}{\sqrt{2}}$ (b) $2C$

(c) $\sqrt{2}\,C$ (d) $\frac{C}{2}$

24. Near and far points of human eye are

(a) 25 cm and infinite (b) 25 cm and 100 cm

(c) 55 cm and 200 cm (d) 0 cm and 25 cm

25. The distance at which the magnetic field on axis as compared to the magnetic field at the centre of the coil carrying current I and radius R is 1/8, would be

(a) $R/\sqrt{3}$ (b) $\sqrt{2}R$

(c) 2R (d) $\sqrt{3}R$

26. In an experiment to measure the internal resistance of a cell by potentiometer, it is found that the balance point is at a length of 2 m when the cell is shunted by a 4 Ω resistance and at 3 m when cell is shunted by a 8 Ω resistance. The internal resistance of cell is -

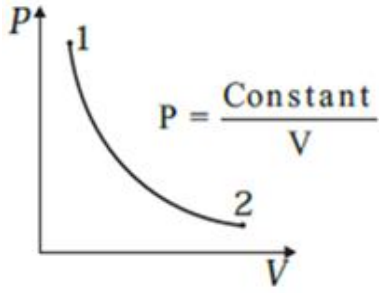
(a) 12 Ω (b) 8 Ω

(c) 16 Ω (d) 1 Ω

Space for rough work

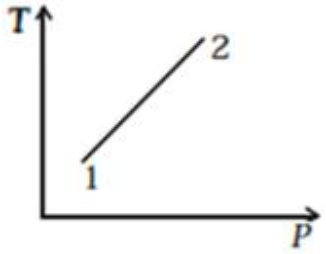
SAMPLE TEST PAPER

27. Consider P-V diagram for an ideal gas as shown.

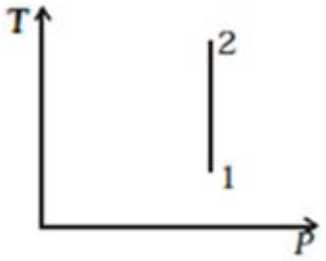


Out of the following diagram, which represents the T-P diagram?

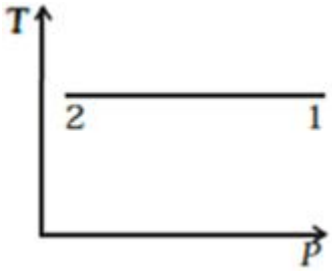
(a)



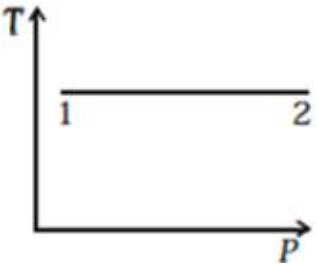
(b)



(c)



(d)



28. The radius of a metal sphere at room temperature T is R, and the coefficient of linear expansion of the metal is α. The sphere is heated a little by a temperature ΔT so that its new temperature is $T + \Delta T$. The increase in the volume of the sphere is approximately

(a) $2\pi R\ \alpha\ \Delta T$ (b) $\pi R^2\ \alpha\ \Delta T$

(c) $4\pi R^3\ \alpha\ \Delta T / 3$ (d) $4\pi R^3\ \alpha\ \Delta T$

29. A ray of light incident at an angle θ on a refracting face of a prism emerges from the other face normally. If the angle of the prism is 5° and the prism is made of a material of refractive index 1.5, the angle of incidence is

(a) 7.5° (b) 5°

(c) 15° (d) 2.5°

30. A person rows a boat across a river making an angle of 60° with the downstream. The percentage time he would have saved, if he had crossed the river in the shortest possible time is

(a) 13.4 % (b) 15.5%

(c) 12.5% (d) 20.5%

Space for rough work

CHEMISTRY (SECTION - III)

31. KBr crystallises in NaCl type of crystal lattice and its density is 2.75 g/cm^3. Number of unit cells of KBr present in a 1.00 mm^3 grain of KBr are

(a) 3.6×10^{18} (b) 3.6×10^{16}

(c) 2.34×10^{28} (d) 6.02×10^{24}

32. The number of P – O – P and P – O – H bonds present respectively in pyrophosphoric acid molecule are

(a) 1, 2 (b) 2, 2

(c) 1, 4 (d) 1, 8

33. At 500 K, the half life period of a gaseous reaction at an initial pressure of 80 kPa is 350 s. When the pressure is 40 kPa, the half life period is 175 sec; the order of the reaction is :

(a) zero (b) one

(c) two (d) three

34. Which enzyme converts glucose and fructose both into ethanol

(a) Diastase (b) Invertase

(c) Zymase (d) Maltase

35. The smallest matter particle that can take part in chemical reaction is

(a) Atom (b) Molecule

(c) Both (a) and (b) (d) None of these

36. Which of the following sets of quantum numbers could represent the last electron added to complete the electron configuration for a ground state atom of Br(Z = 35) according to the Aufbau principle, n ; l ; m_l ; m_s

(a) $4 ; 0 ; 0 ; -\frac{1}{2}$ (b) $4 ; 1 ; 1 ; -\frac{1}{2}$

(c) $3 ; 1 ; 1 ; -\frac{1}{2}$ (d) $4 ; 1 ; 2 ; +\frac{1}{2}$

37. Number of sigma bonds in P_4O_{10} is

(a) 6 (b) 7

(c) 17 (d) 16

38. A compound formed by elements A and B crystallises in cubic structure in which A atoms are at the corners of the cube while B atoms are at the centre of cubic structure. Formula of the compound is

(a) A_2B_3 (b) AB_2

(c) AB_3 (d) AB

39. $C_6H_5OH + CHCl_3 + NaOH \rightarrow$ Salicylaldehyde the electrophile involved in the above reaction is

(a) Dichloromethyl cation ($CHCl_2$)

(b) Dichlorocarbene (: CCl_2)

(c) Trichloromethyl anion $\bar{C}Cl_3$

(d) Formyl cation (CHO)

40. Which one of the following constitutes a group of the isoelectronic species?

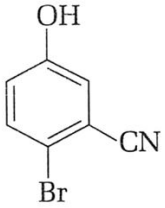
(a) C_2^{2-}, O_2^-, CO, NO

(b) CN^-, N_2, O_2^{2-}, C_2^{2-}

(c) NO^+, C_2^{2-}, CN^-, N_2

(d) N_2, O_2^-, NO^+, CO

41. The IUPAC name of the following compound, is



(a) 4-bromo-3-cyanophenol

(b) 2-bromo-5-hydroxybenzonitrile

(c) 2-cyano-4-hydroxybromobenzene

(d) 6-bromo-3-hydroxybenzonitrile

Space for rough work

SAMPLE TEST PAPER

42. When two liquids A and B are mixed, the boiling point of the mixture become greater than the boiling points of pure liquid A and liquid B. The mixture is:

(a) Ideal solution

(b) Non ideal solution with negative deviation from Raoult's Law

(c) Non ideal solution with positive deviation from Raoult's Law

(d) Normal solution

43. The first, second and third ionization potentials (E_1, E_2 and E_3) for an element are 7 eV, 12.5 eV and 142.3 eV respectively. The most stable oxidation state of the element will be

(a) 1 (b) 2

(c) 3 (d) 4

44. The number of unpaired electrons in $[CoF_6]^{3-}$ are

(a) 1 (b) 2

(c) 3 (d) 4

45. If the density of methanol is 0.793 kg L^{-1}, what is its volume needed for making 2.5 L of its 0.25 M solution?

(a) 25.2 (b) 2.52

(c) 0.25 (d) None of these

46. The increasing order of acidity among **phenol, p-methylphenol, m-nitrophenol and p-nitrophenol** is:

(a) m-nitrophenol, p-nitrophenol, phenol, p-methylphenol

(b) p-methylphenol, m-nitrophenol, phenol, p-nitrophenol

(c) p-methylphenol, phenol,m-nitrophenol, p-nitrophenol

(d) Phenol, p-methylphenol, p-nitrophenol, m-nitrophenol

47. The cell, $Zn/Zn^{2+}(1M)||Cu^{2+}(1M)/Cu\left(E^0_{cell}=1.10V\right)$ was allowed to be completely discharged at 298K. The relative concentration of Zn^{2+} to Cu^{2+} $\left(\frac{[Zn^{2+}]}{[Cu^{2+}]}\right)$ is 10^x. Integral the value of x is:

(Take $\frac{2.303RT}{F}=0.059$ Round off your answer up to one decimal)

(a) 37 (b) 3

(c) 370 (d) None of these

48. The number of orbitals associated with quantum number n = 4, $m_s=+\frac{1}{2}$ is :

(a) 15 (b) 16

(c) 25 (d) 34

49. The density of O_2 is 16 at STP. At what temperature(in °C) its density will be 14 ? Consider that the pressure remains constant.

(a) 30° (b) 35°

(c) 39° (d) 45°

50. Which one of the following is the strongest lewis acid?

(a) BF_3 (b) BCl_3

(c) BBr_3 (d) BI_3

Space for rough work

SAMPLE TEST PAPER

BOTANY (SECTION - IV)

51. A girdled tree (upto bark) may survive for some time but it will eventually die because

(a) Sugar and other organic materials will not move downwards.

(b) Sugar and other organic materials will not move upwards.

(c) Water will not move downwards.

(d) Water will not move upwards.

52. Dichlorophenyl dimethyl urea (DCMU)

(a) Inhibits O_2 evolution and non cyclic-phosphorylation

(b) Promotes O_2 evolution and non cyclic-phoshphorylation

(c) Both (a) and (b)

(d) None of these

53. Which is not true regarding active water absorption

(a) Require energy

(b) Occurs only when transpiration is slow

(c) Living cells are essential

(d) Force develops in shoot

54. What is the direction of movement of sugars in phloem

(a) Non-multidirectional (b) Upward

(c) Downward (d) Bi-directional

55. Xylem translocates :

(a) Water only

(b) Water and mineral salts only

(c) Water, mineral salts and some organic nitrogen only

(d) Water, mineral salts, some organic nitrogen and hormones

56. Stomatal movement is not affected by

(a) Temperature (b) Light

(c) CO_2 concentration (d) O_2 concentration

57. Which of the following statements is correct?

(a) Ovules are not enclosed by ovary wall in gymnosperms

(b) Selaginella is heterosporous, while salvinia is homosporous

(c) Stems are usually unbranched in both cycas and cedrus

(d) Horsetails are gymnosperms

58. Alcoholic fermentation are differed from lactic acid fermentation in

(a) Involving decarboxylases activity apart from dehydrogenase activity

(b) Oxidation of NADH to NAD^+

(c) Zn^{2+} as a cofactor for dehydrogenase

(d) Net gain of 2ATP molecules

59. Respiratory quotient (RQ) value of tripalmitin is

(a) 0.9 (b) 0.7

(c) 0.07 (d) 0.09

60. Conversion of glucose to glucose–6–phoshphate, the first irreversible reaction of glycolysis, is catalyzed by

(a) Aldolase (b) Hexokinase

(c) Enolase (d) Phosphofructokinase

61. The experiment proof for semiconservative replication of DNA was first shown in

(a) Fungus (b) Bacterium

(c) Virus (d) Plant

Space for rough work

SAMPLE TEST PAPER

62. The final proof for DNA as the genetic material came from the experiments of

(a) Griffith

(b) Hershey and Chase

(c) Avery, MacLeod and Mc Carty

(d) Hargobind Khorana

63. The innermost layer of anther wall in angiospermic plants is

(a) Endothelium which is nutritive layer

(b) Tapetum which is polyploid

(c) Middle layers which are ephemeral

(d) Tapetum which plays a vital role in dehiscence of anther

64. In some plants, the female gamete develops into embryo without fertilization. This phenomenon is known as

(a) Autogamy (b) Parthenocarpy

(c) Syngamy (d) Parthenogenesis

65. How many ATP are required for the formation of one molecule of NH_3 by the nitrogenase enzyme?

(a) Six (b) Eight

(c) Twelve (d) Sixteen

66. Non symbiotic nitrogen fixing prokaryote is

(a) Frankia (b) Azotobacter

(c) Acetobacter (d) Rhizobium

67. What is the site of perception of photoperiod necessary for induction of flowering in plants?

(a) Lateral buds (b) Pulvinus

(c) Shoot apex (d) Leaves

68. The non-human model organisms sequenced in human genome project were

(a) A nematode and fruit fly

(b) Wheat and rice

(c) Fish and birds

(d) Garden pea and fruit fly

69. If karyokinesis is not followed by cytokinesis then gives rise to

(a) Zygote (b) Fertillised egg

(c) Multinucleate condition (d) Embryo

70. Function of telomeres in nucleus is

(a) Poleward movement

(b) To initiate the RNA synthesis

(c) To seal the ends of chromosome

(d) To recognize the homologous chromosome

Space for rough work

SAMPLE TEST PAPER

ZOOLOGY (SECTION - V)

71. Contractile unit of muscle is part of myofibril between

(a) Z-line and I-band (b) Z-line and Z-line
(c) Z-line and A-band (d) A-band and I-band

72. Mark the statement that is incorrect for steroid hormones.

(a) Steroid hormones bind to specific intracellular receptor proteins
(b) The steroid hormones are slower and last longer than the actions of water soluble hormones
(c) The steroid hormones after the pattern of gene expression initiating the transcription of some genes, while repressing the transcription of others
(d) The steroid hormones that use cAMP as secondary messenger bring faster effects as compared to other steroid hormones

73. Retrogressive metamorphosis is found in

(a) Amphioxus (b) Rana
(c) Ascidia (d) All protochordates

74. Which among these is the correct combination of aquatic mammals?

(a) Seals, Dolphins, Sharks
(b) Dolphins, Seals, Trygon
(c) Whales, Dolphins, Seals
(d) Trygon, Whales, Seals

75. Select the mismatch –

(a) Chitin – Polymer of glucosamine
(b) Glycogen – Polymer of glucose
(c) Cellulose – Heteropolysaccharide
(d) Insulin – Homopolysaccharide

76. Mark the incorrect statement about adult human haemoglobin

(a) It is made up of four subunits
(b) Two subunits are of α -type and two subunits of β -type
(c) It has quaternary structure of with respect to level of organisation
(d) It is a simple protein

77. Somatic chromosome number is same in

(a) Chimpanzee and Gorilla
(b) Man and Chimpanzee
(c) Male & Female honeybee
(d) Man and Gorilla

78. About which day in a normal human menstrual cycle does rapid secretion of LH (Popularly called LH-surged) normally occurs.

(a) 5th day (b) 11th day
(c) 14th day (d) 20th day

79. S. miller created electric discharge in a closed flask containing CH_4, H_2, NH_3 and water vapours at 800°C and initially observed formation of

(a) Fats (b) Amino acids
(c) Nucleic acid (d) Polysaccharides

80. Endothelium lining a blood vessel is formed of

(a) Ciliated epithelium
(b) Columnar epithelium
(c) Cuboidal epithelium
(d) Simple squamous epithelium

Space for rough work

SAMPLE TEST PAPER

81. Industrial melanism in England is an example of _____ selection, in which _____ choose the option that fills the blank

(a) Directional, two peaks form

(b) Directional, peak shifts in one direction

(c) Stabilising, peak gets higher and narrower

(d) Disruptive, peak shifts in one direction

82. Which of the following is a pair of homologous organs

(a) Pectoral fins on fish and force limb of horse

(b) Wings of grasshopper and wings of crow

(c) Lungs of rabbit and gills of prawn

(d) Wings of bat and wings of butterfly

83. What happens if amygdala of a person is damaged?

(a) Person will forget recent events and cannot commit anything to memory

(b) Person will fail to recognise fearful expression of others/or to express fear in appropriate situation

(c) Person fails to maintain the body temperature

(d) Person fails to show muscle coordination

84. The change in membrane potential from – 70 mV to – 80 mV is represented as

(a) Resting membrane potential

(b) Hyperpolarisation graded potential

(c) Depolarisation of potential

(d) Action potential

85. In man and other mammals, air passes from outside into the lungs through

(a) Nasal cavity, larynx, pharynx, trachea, bronchi, alveoli

(b) Nasal cavity, larynx, pharynx, trachea, bronchioles, alveoli

(c) Nasal cavity, pharynx, larynx, trachea, bronchioles, bronchi, alveoli

(d) Nasal cavity, pharynx, larynx, trachea, bronchi, bronchioles, alveoli

86. Which of the following reflex is involved to prevent excessive inflation of lungs?

(a) Stretch reflex

(b) Hering - Breuer's reflex

(c) Withdrawal reflex

(d) Conditional reflex

87. If fat/cholesterol is deposited in the artery supplying the heart musculature it can lead to

(a) Atherosclerosis (b) Cardiac arrest

(c) Heart failure (d) varicose veins

88. In case of dehydration, secretion of all harmones increases except that of

(a) Renin (b) Aldosterone

(c) Vasopressin (d) ANF

89. Examination of blood of a person suspected of having anaemia shows large, immature, nucleated erythrocytes without haemoglobin. Supplementing this diet with which of the following, is likely to alleviate his symptoms?

(a) Thiamine

(b) Folic acid and cobalamine

(c) Riboflavin

(d) Iron compounds

90. Which of the following is a powerful vasoconstrictors that increases the glomerular blood pressure and there by GFR

(a) Renin (b) At. Angiotensin-II

(c) Aldosterone (d) ANF

Space for rough work