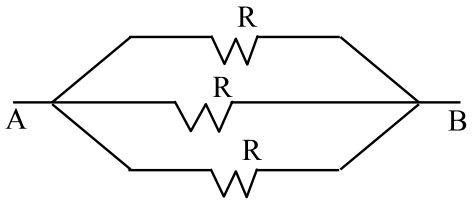
ACE OF PACE - SAMPLE PAPER (MEDICAL)

Note: Sample papers are to indicate difficulty level, not consistent with syllabus.

SECTION – 1 (PHYSICS)

1. Find R equivalent across AB for the circuit



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

2. A particle starts to move with a velocity 20 m/s and its acceleration is $2\,m/sec^2$. Find its velocity after 4 sec.

(A) $42\,m/s$ (B) $28\,m/s$ (C) $36\,m/s$ (D) $20\,m/s$

3. A particle is thrown vertically upward with velocity 20 m/s. Find its acceleration (in m/s^2) at the highest point.

(A) - 9.8 (B) -20 (C) 0 (D) None of these

4. In a wire, 16 Coulomb charge flows in 4 seconds . Find current flowing through wire.

(A) 64 A (B) 16A (C) 4A (D) 8A

5. Focal length of concave mirror and concave lens is

(A) $+,+$ (B) $+,-$ (C) $-,-$ (D) $-,+$

6. In generator

(A) Mechanical energy is converted into electrical energy.
(B) Electrical energy is converted into mechanical energy.
(C) Chemical energy is converted into electrical energy.
(D) Chemical energy is converted into mechanical energy.

7. A particle of mass 1kg is thrown upward with velocity 10 m/s. Find magnitude of change in momentum of the particle by the time it comes back.

(A) 20kgm/s (B) 10kgm/s (C) 0 (D) None of these

SPACE FOR ROUGH WORK

8. 2 kg and 3 kg stone are dropped, from height h. Which one will hit the ground first?
(A) 2 kg (B) 3 kg
(C) both will hit the ground on same time (D) none of these

9. Find work done by the boy, if he carried a luggage of 4 kg on his head and climbed 10m upwards at a constant speed of 5m/s.
(A) 40 J (B) 400 J (C) 0 J (D) none of these

10. In above question instead of moving in upward direction, if he had moved 10 m along horizontal direction then find the work done by the boy.
(A) 40 J (B) 400 J (C) 0 J (D) none of these

11. A mirror forms a virtual image of a real object
(A) It must be a convex mirror
(B) It must be a concave mirror
(C) It must be a plane mirror
(D) It may be any of the mirrors mentioned above

12. The number of surfaces bounding a triangular prism is
(A) 3 (B) 4 (C) 5 (D) 6

13. The magnetic field lines inside a long current carrying solenoid are nearly
(A) straight (B) circular (C) parabolic (D) elliptical

14. The magnification m of an image formed by a spherical mirror is negative. It means, the image is
(A) smaller than the object (B) larger than the object
(C) erect (D) inverted

15. A parallel beam of light falling on the eye gets focused on the retina because of refractions at
(A) the cornea (B) the crystalline lens
(C) the vitreous humor (D) various surface in the eye

16. The muscles of the iris control the
(A) focal length of the eye-lens (B) opening of the pupil
(C) shape of the crystalline lens (D) optic nerve

SPACE FOR ROUGH WORK

17. Ampere is the same as
(A) volt / second (B) watt / second (C) joule / second (D) coulomb / second

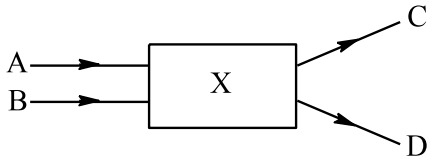
18. When white light passes through a prism, it splits into its component colours. This phenomenon is called
(A) spectrum (B) reflection (C) refraction (D) dispersion

19. The angle of incidence is the angle between
(A) The incident ray and the surface of the mirror.
(B) The reflected ray and the surface of the mirror.
(C) The normal to the surface and the incident ray.
(D) The normal to the surface and the reflected ray.

20. A negative charge released from a point A moves along the line AB. The potential at A is 15 V, and it varies uniformly along AB. The potential at B
(A) may be 10 V (B) may be 15 V (C) may be 20 V (D) must be 15 V

21. Which one of the following materials cannot be used to make a lens?
(A) Water (B) Glass (C) Plastic (D) Clay

22. Light rays A and B fall on optical component X and come out as C and D respectively.



The optical component is a –
(A) concave lens (B) convex lens
(C) convex mirror (D) prism

23. The radius of curvature of a plane mirror is –
(A) zero (B) infinite (C) negative (D) finite

24. When a ray of light travels from one medium to another medium, then which of the following quantity remains constant?
(A) Wavelength (B) Frequency
(C) Speed (D) All of these

25. What is the current through a 5.0 ohm resistor if the voltage across it is 10V -
(A) zero (B) 0.50 A (C) 2.0 A (D) 5.0 A

SPACE FOR ROUGH WORK

SECTION – 2 (CHEMISTRY)

26. Compound 'A' used for white wash on thermal decomposition give compound 'B' reacts vigorously with water to produce compound 'D' Compound 'D' on treating with CO_2 gives back compound A. Then the compounds A, B, and D are
(A) CaO, $CaCO_3$, $Ca(OH)_2$ (B) $CaCO_3$, CaO, $Ca(OH)_2$
(C) $CaCO_3$, $Ca(OH)_2$, CaO (D) $Ca(OH)_2$, CaO, $CaCO_3$

27. Which of the following is most acidic?
(A) Blood (B) Milk of magnesia (C) Lemon juice (D) Gastric juice

28. Which of the following compound is used by doctors for supporting fractured bones?
(A) $CaSO_4 \cdot \frac{1}{2}H_2O$ (B) $CaSO_4 \cdot 2H_2O$ (C) $Na_2CO_3 \cdot 10H_2O$ (D) Na_2SO_4

29. Which of the following compound is used in removing permanent hardness of water?
(A) Na_2CO_3 (B) $CaCl_2$ (C) Na_2SO_4 (D) $CaOCl_2$

30. The products obtained in the chlor-alkali process is/are
(A) NaOH (B) Cl_2 (C) H_2 (D) All of the above

31. Which of the following is a precipitation reaction?
(A) $ZnO + C \rightarrow Zn + CO$ (B) $MnO_2 + 4HCl \rightarrow MnCl_2 + 2H_2O + Cl_2$
(C) $NaCl + AgNO_3 \rightarrow AgCl + NaNO_3$ (D) $CuO + H_2 \rightarrow Cu + H_2O$

32. Which of the following element cannot displace Cu form $CuSO_4$ solution?
(A) Ag (B) Fe (C) Zn (D) Pb

33. Which of the following compound is used to dry a gas in the laboratory?
(A) $CaSO_4$ (B) $NaHCO_3$ (C) NaOH (D) $CaCl_2$

34. Which of the following is basic?
(A) Bee-Sting (B) Nettle-sting (C) Toothpaste (D) Coffee

SPACE FOR ROUGH WORK

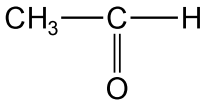
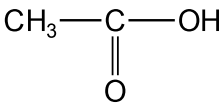
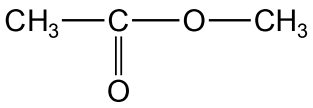
35. 35. Which of the following is alloy of lead?
(A) Brass (B) Solder (C) Bronze (D) Stainless steel

36. The chemical compound used in soda – acid fire extinguishers is
(A) Na_2CO_3 (B) $NaHCO_3$ (C) $CaCO_3$ (D) $CaSO_4$

37. Which of the following pair of elements combined to give ionic compound?
(A) P and Cl (B) S and F (C) N and O (D) Ca and O

38. Which of the following is an alloy of mercury ?
(A) Brass (B) Bronze (C) Solder (D) Amalgam

39. The difference between the water of crystallization of gypsum and plaster of paris is
(A) $\frac{1}{2}H_2O$ (B) $\frac{3}{2}H_2O$ (C) $\frac{5}{2}H_2O$ (D) $2H_2O$

40. Which of the following is a sweet smelling substance used in making perfumes?
(A) CH_3OH (B) 
(C)  (D) 

41. The pH of milk of magnesia is
(A) 10 (B) 7.4 (C) 2.2 (D) 1.2

42. The number of $C-H$ bonds in cyclohexane is
(A) 4 (B) 6 (C) 8 (D) 12

43. Which of the following is a Bleaching powder?
(A) $CaCl_2$ (B) $Ca(OCl)_2$ (C) $CaOCl_2$ (D) $Ca(HCO_3)_2$

SPACE FOR ROUGH WORK

44. In Mendeleev's periodic table, Fe, Co and Ni were placed in
(A) group - 6 (B) group - 7 (C) group - 8 (D) group - 5

45. The reaction involved in thermite process is
(A) $Fe_2O_{3(s)} + 2Al_{(s)} \rightarrow 2Fe_{(l)} + Al_2O_{3(s)}$ (B) $3MnO_{2(s)} + 4Al_{(s)} \rightarrow 3Mn_{(l)} + 2Al_2O_{3(s)}$
(C) $Fe_2O_{3(s)} + 6Na_{(s)} \rightarrow 2Fe_{(l)} + 3Na_2O_{(s)}$ (D) $Fe_2O_{3(s)} + 3Ca_{(s)} \rightarrow 2Fe_{(l)} + 3CaO_{(s)}$

46. Which of the following is an electrovalent compound?
(A) CO_2 (B) CH_4 (C) NaCl (D) H_2O

47. Dehydration of ethanol results in the formation of a compound 'X' along with water, Hydrogenation of 'X' forms another compound 'Y'. 'X' and 'Y' respectively are :
(A) Ethene and ethane (B) Ethanol and ethane
(C) Ethane and methane (D) Ethanoic acid and methane

48. Thermite process is an example of a
(A) Decomposition reaction (B) Combination reaction
(C) Displacement reaction (D) Neutralisation reaction

49. Which of the following metal is used in storage battery?
(A) Iron (B) Lead (C) Tin (D) Zinc

50. Which of the following pairs of elements have same number of valence electrons?
(A) Carbon and nitrogen (B) Oxygen and sulphur
(C) Potassium and calcium (D) Sodium and magnesium

SPACE FOR ROUGH WORK

SECTION – 3 (BIOLOGY)

51. Which among the following show vascular bundles?
(A) Gymnosperms (B) Angiosperms (C) Pteridophytes (D) All the above

52. Which DNA molecule among the following will melt at lowest temperature?
(A) 5'–A–A–T–G–C–T–G–C–3'
3'–T–T–A–C–G–A–C–G–5'
(B) 5'–A–A–T–A–A–A–G–C–T–3'
3'–T–T–A–T–T–T–C–G–A–5'
(C) 5'–G–C–A–T–A–G–C–T–3'
3'–C–G–T–A–T–C–G–A–5'
(D) 5'–A–T–G–C–T–G–A–T–3'
3'–T–A–C–G–A–C–T–A–5'

53. The most important chlorophyll present in plants reaction center is _____
(A) Chlorphylla (B) Chlorophyll c (C) Chlorophyll b (D) Both A and C

54. Chlorophyll contains _____ as one of the structural component.
(A) Fe (B) Mg (C) Mo (D) Mn

55. In plant mineral nutrition, elements are classified as macro or micro-elements depending upon their
(A) relative presence in plant ash
(B) relative importance in plant growth
(C) relative amount required in plants
(D) relative availability in soil

56. An ecosystem which can be easily damaged but can recover after some time if damaging effect stops will be having
(A) low stability and high resilience
(B) high stability and low resilience
(C) low stability and low resilience
(D) high stability and high resilience

57. Dark reaction is traced by
(A) X-rays (B) O^{18} (C) $^{14}CO_2$ (D) P^{32}

58. If all the tissues except xylem of main stem of a plant are removed in a ring
(A) the root dies first
(B) the shoot dies first
(C) the root and shoot will die at the same time
(D) neither the root nor the shoot will die

59. If a photosynthesizing plant releases oxygen containing more than the normal amount of ^{18}O, it is concluded that the plant has been supplied with
(A) $C_6H_{12}O_6$ containing ^{18}O
(B) H_2O containing ^{18}O
(C) CO_2 containing ^{18}O
(D) oxygen in the form of ozone

60. A cell placed in a strong salt solution will shrink because
(A) mineral salts will break the cell wall
(B) salt water will enter the cell
(C) water comes out by exosmosis
(D) cytoplasm will decompose

61. If a dried cobalt chloride paper is clipped on the under surface of a leaf its colour changes from blue to pink because
(A) it reacts with the chlorophyll of the leaf
(B) the clipper puts a pressure on the paper
(C) paper is moistened by the transpiring water
(D) it comes in contact with green leaf

62. Clinostat is the apparatus, which is used to
(A) measure growth of stem
(B) eliminate the effect of gravity causing geotropism

(C) identify the chemicals present in stem tip
(D) measure growth rate

63. Which of the following features does all organisms who does gas exchange have in common?
(A) They are enclosed in ribs
(B) They are maintained at constant temperature
(C) They are exposed to atmosphere
(D) The exchange surfaces are moist

64. Which one of the following is a biologically incompatible marriage?
(A) Rh positive male and Rh positive female
(B) Rh negative male and Rh positive female
(C) Rh positive male and Rh negative female
(D) Rh negative male and Rh negative female

65. Animal species living in chronic shortage of water generally excrete uric acid as the principal nitrogenous waste products because
(A) Uric acid can be stored in the body for long periods
(B) Uric acid is highly soluble in water and can be easily eliminated
(C) The kidneys are unable to convert uric acid into urea
(D) Enzymes for the formation of urea are absent

66. Which of the following tissues in a human being uses the greatest amount of energy?
(A) Vascular tissue
(B) Muscular tissue
(C) Nervous tissue
(D) Epithelial tissue

67. Number of floating ribs in human body is
(A) 5 pairs (B) 7 pairs (C) 2 pairs (D) 3 pairs

68. A man suddenly sees a tiger, his heartbeat goes up, blood pressure increase, etc. Which hormone is released at this time in his body?
(A) Parathormone (B) Adrenaline (C) Corticoid (D) Thyroxine

69. Which of the following sets of animals produce the same substance as their chief excretory product?
(A) Cockroach, Camel and Lizard
(B) Man, Dog and Camel
(C) Snake, Man, Bird
(D) Cat, Fish and Frog

70 Osmoregulation is the control over the
(A) Removal of nitrogen from the body
(B) Concentration of salt and water in the body
(C) Osmotic properties of cell membrane
(D) pH of the blood

71. Lungs have a large number of alveoli for
(A) Spongy texture and proper shape
(B) More surface area for diffusion of gases
(C) More space for increasing volume of expired air
(D) More nerve supply

72. Mark the CORRECT statement w.r.t man.
(A) All arteries carry oxygenated blood while all veins carry deoxygenated blood
(B) Arteries are provided with valves while veins are devoid of valves
(C) Arteries always carry blood away from the heart, while veins always carry blood towards the heart.
(D) Venous blood is returned to left atrium.

73. Efferent nerve fibres carry impulse from
(A) Effector organs towards central nervous system
(B) Receptors towards central nervous system
(C) Central nervous system towards muscles
(D) Central nervous system towards receptors

74. The part of digestive system in humans that secretes the majority of digestive enzymes is
(A) Liver (B) Pancreas
(C) Stomach (D) Salivary glands

75. Which part of mammalian brain is responsible for regulation of body temperature?
(A) Cerebrum (B) Cerebellum
(C) Medulla oblongata (D) Hypothalamus

ANSWER KEY ACE OF PACE CLASS 10th MEDICAL		
PHYSICS	**CHEMISTRY**	**BIOLOGY**
1. (A)	26. (B)	51. (D)
2. (B)	27. (D)	52. (B)
3. (A)	28. (A)	53. (A)
4. (B)	29. (A)	54. (B)
5. (D)	30. (D)	55. (C)
6. (A)	31. (C)	56. (A)
7. (A)	32. (A)	57. (C)
8. (C)	33. (D)	58. (A)
9. (B)	34. (C)	59. (B)
10. (C)	35. (B)	60. (C)
11. (D)	36. (B)	61. (C)
12. (C)	37. (D)	62. (B)
13. (A)	38. (D)	63. (D)
14. (D)	39. (B)	64. (C)
15. (D)	40. (D)	65. (A)
16. (B)	41. (A)	66. (B)
17. (D)	42. (D)	67. (C)
18. (D)	43. (C)	68. (B)
19. (C)	44. (C)	69. (B)
20. (C)	45. (A)	70. (B)
21. (D)	46. (C)	71. (B)
22. (A)	47. (A)	72. (C)
23. (B)	48. (C)	73. (C)
24. (B)	49. (B)	74. (B)
25. (C)	50. (B)	75. (D)

ACE OF PACE (SOLUTION)

1. (A) $\text{Req} = \dfrac{R}{3}$

All in parallel

$\therefore \dfrac{1}{\text{Req}} = \dfrac{1}{R_1} + \dfrac{1}{R_2} + \dfrac{1}{R_3}$

2. (B)

$v = u + at$

$= 20 + 2 \times 4$

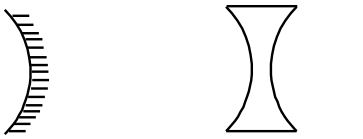
$= 28\,m/c$

3. (A) during the whole motion particle acceleration is constant.

4. (C)

$I = \dfrac{q}{t} = 4A$

5. (D)



Concave mirror $f < 0$ Concave mirror $f > 0$

6. (A) Theoretical

7. (A) Particle strikes ground with some speed

$\Delta P = m(v - u)$

$= m(10 - (-10))$

$= 1 \times 20 = 20$

8. (C)

$h = \dfrac{1}{2} g t^2$

$t = \sqrt{\dfrac{2h}{g}}$

Time period is independent of mass.

9. (B)

$W = F \cdot S$

$= 40 \times 10 \times \cos 0$

$= 400\,J$

10. (C)

$$W = F \cdot S$$
$$= 40 \times 10 \times \cos 90$$
$$= 0\,J$$

11. (D) For an object placed between pole and focus of concave mirror the image is virtual.

12. (C) A prism has two triangular bases with three rectangular faces.

13. (A) A solenoid is just like a bar magnet.

14. (D) $$m = \frac{\text{height of image}}{\text{height of object}}$$

15. (D) Theory

16. (B) Theory

17. (D) $$\text{Current} = \frac{\text{Charge}}{\text{Time}}$$

18. (D) Dispersion is splitting of light into its constituent colors.

19. (C) Theory

20. (C) A negative charge will be attracted by positive charge at higher potential points.

21. (D) Theoretical

22. (A) Concave lens is diverging in nature.

23. (B) Theoretical

24. (B) When a ray of light travels from one medium to another medium, then velocity and wave length both change simultaneously but frequency remains constant

25. (C) $$I = \frac{V}{R} = \frac{10}{5} = 2A$$

26. (B)

$$\underset{(A)}{CaCO_{3(s)}} \xrightarrow{\Delta} \underset{(B)}{CaO_{(s)}} + \underset{(C)}{CO_{2(g)}}$$

$$\underset{(B)}{CaO_{(s)}} + H_2O \rightarrow \underset{(D)}{Ca(OH)_{2(aq)}}$$

$$\underset{(D)}{Ca(OH)_{2(aq)}} + CO_{2(g)} \rightarrow \underset{(A)}{CaCO_{3(s)}} + H_2O_{(l)}$$

27. (D)

	pH	
Gastric Juice	–	1.2
Lemon juice	–	2.2
Blood	–	7.4
Milk of Magnesia	–	10

28. (A) $CaSO_4.\frac{1}{2}H_2O$ - Plaster of Paris is used for supporting fractured bone by doctors

29. (A) Na_2CO_3 – Sodium carbonate is used for removing permanent hardness of water

30. (D) In chlor-alkali process $2NaCl_{(ar)} + 2H_2O_{(l)} \rightarrow 2NaOH_{(aq)} + Cl_{2(g)} + H_{2(g)}$

31. (C) $NaCl_{(aq)} + AgNO_{3(aq)} \rightarrow AgCl_{(s)} + NaNO_{3(aq)}$

White Precipitate

32. (A) Fe, Zn and Pb are more reactive than Cu and Ag is less reactive, So Ag can't displace Cu from $CuSO_4$ solution

33. (D) $CaCl_2$ – Calcium chloride is used to dry any gas in the laboratory

34. (C) Toothpastes, are generally basic for cleaning the teeth can neutralise the excess acid and prevent tooth decay.

35. (B)

Brass	–	Cu and Zn
Bronze	–	Cu and Sn
Stainless steel	–	Fe, Ni and Cr
Solder	–	Pb and Sn

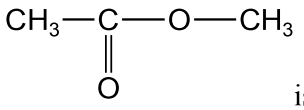
36. (B) Sodium hydrogen carbonate ($NaHCO_3$) is used in Soda-acid fire extinguishers

37. (D) The compounds formed by the transfer of electrons from a metal to a non-metal are known as ionic compounds Eg, CaO, $MgCl_2$ etc;

38. (D) Alloy of mercury is amalgam
Brass is an alloy of Cu and Zn
Bronze is an alloy of Cu and Sn

39. (B) $CaSO_4.2H_2O \xrightarrow[373K]{\Delta} CaSO_4.\frac{1}{2}H_2O + 1\frac{1}{2}H_2O$

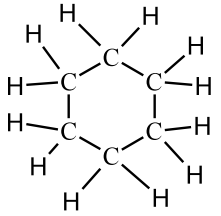
40. (D)



is an ester (methylethanoate) a sweet smelling substance used in making perfumes.

41. (A) Milk of magnesia is a $Mg(OH)_2$ solution of pH 10. It is alkaline solution.

42. (D) Cyclohexane is C_6H_{12}



43. (C) Bleaching powder is $CaOCl_2$ ie, calcium chloro hypochlorite.

44. (C) Fe, Co and Ni was placed in group – 8 in Mendeleev's periodic table.

45. (A) The reaction of iron (III) oxide (Fe_2O_3) with aluminium is used to join railway tracks or cracked machine parts. This reaction is known as the thermite reaction.

$$Fe_2O_{3(s)} + 2Al_{(s)} \rightarrow 2Fe_{(l)} + Al_2O_{3(s)}$$

46. (C) NaCl is electrovalent (or) ionic compound exists as Na^+ and Cl^- ions.

47. (A)

$$\underset{\text{Ethanol}}{CH_3CH_2OH} \xrightarrow[-H_2O]{\Delta} \underset{\text{Ethene}(x)}{CH_2=CH_2}$$

$$\underset{\text{Ethene}}{CH_2=CH_2} \xrightarrow{H_2} \underset{\text{Ethane}}{CH_3-CH_3}$$

(X) (Y)

48. (C) $FeO_3 + 2Al \rightarrow Al_2O_3 + 2Fe$
This reaction is involved in thermite process.
It is a displacement reaction

49. (B) Pb (Lead) is used in storage battery

50. (B) Oxygen (Z=8) 2, 6
Sulphur (Z=16) 2, 8, 6
Both have '6' valence electrons

51. (D) (A) Gymnospermes, (B) Angiosperms, (C) Pteridophytes

52. (B) $5'-A-A-T-A-A-A-G-C-T-3'$
$3'-T-T-A-T-T-T-C-G-A-5'$

53. (A) Chlorphyll a

54. (B) Mg

55. (C) relative amount required in plants

56. (A) low stability and high resilience

57. (C) $^{14}CO_2$

58. (A) the root dies first

59. (B) H_2O containing ^{18}O

60. (C) water comes out by exosmosis

61. (C) paper is moistened by the transpiring water

62. (B) eliminate the effect of gravity causing geotropism

63. (D) Only vertebrates have ribs. Animals can be cold blooded also. Organs can be internally Present and hence not exposed to atmosphere

64. (C) Such marriage shall lead foetus to suffer from HDN i.e. hemolytic disease of newborn

65. (A) Uricotelism is feature of animals to conserve water in body

66. (B) Muscles produce movements via regular contraction & relaxation. Contraction is an active process that involves ATP

67. (C) 11^{th} & 12^{th} pair of ribs are floating as they are not connected to sternum or coastal cartilage

68. (B) Adrenaline is released by ANS that is functional during emergency condition of fright-Flight-Fight

69. (b) Man, Dog and Camel are ureotelic as they all are mammals.

70. (b) Loop of Henle of nephron is responsible for osmoregulation due to difference in permeability Of both limbs of loop of Henle.

71. (b) Larger the surface area more shall be exchange of gases.

72. (c) Pulmonary artery carries deoxygenated blood. Valves are found in veins and venous blood is returned to right atrium.

73. (c) Efferent means motor nerve fibres.

74. (b) Liver is devoid of enzymes and saliva and gastric juice has limited enzymes.

75. (d) Hypothalamus is the centre for regulation of temperature, hunger, thirst.